

SYDNEY WATER 2020 OPERATIONAL AUDIT



Report to the Minister

March 2021

© Independent Pricing and Regulatory Tribunal (2021).

With the exception of any:

- (a) coat of arms, logo, trade mark or other branding;
- (b) photographs, icons or other images;
- (c) third party intellectual property; and
- (d) personal information such as photos of people,

this publication is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Australia Licence.



The licence terms are available at the Creative Commons website:

IPART requires that it be attributed as creator of the licensed material in the following manner: © Independent Pricing and Regulatory Tribunal (2021).

The use of any material from this publication in a way not permitted by the above licence or otherwise allowed under the *Copyright Act 1968* (Cth) may be an infringement of copyright. Where you wish to use the material in a way that is not permitted, you must lodge a request for further authorisation with IPART.

Disclaimer

This report is published for the purpose of IPART meeting its reporting requirements to the Minister under section 31(2) of the *Sydney Water Act 1994*. Use of the information in this report for any other purpose is at the user's own risk, and is not endorsed by IPART.

ISBN 978-1-76049-482-7

The Independent Pricing and Regulatory Tribunal (IPART)

We make the people of NSW better off through independent decisions and advice. IPART's independence is underpinned by an Act of Parliament. Further information on IPART can be obtained from IPART's website.

Tribunal Members

The Tribunal members for this review are:

Ms Deborah Cope, Acting Chair Ms Sandra Gamble Mr Mike Smart

Enquiries regarding this document should be directed to a staff member:

Darren Holder	(02) 9290 8441
Robert Aposhian	(02) 9290 8406
Sachin Singh	(02) 9113 7784

Contents

Tril	bunal Members	ii
1	Introduction	1
	1.1 Recommendations	1
	1.2 Sydney Water's operational performance in 2020	4
	1.3 Annual statement of compliance	4
	1.4 Progress with previous recommendations	4
	1.5 Audit scope	5
2	Audit findings and recommendations	6
3	Progress on previous audit recommendations	15
Α	Compliance grades	18
В	Audit process	19
С	2020 Audit scope	23
D	Auditor's report on the operational audit 2020 – Sydney Water	24
Е	Report on clauses audited by IPART – Sydney Water	25
F	Sydney Water's statement of compliance	29
End	d Notes	30

Summary

Customers in NSW rely on safe and reliable water and wastewater services. Operating licences outline the obligations imposed by the NSW Government on publicly owned monopoly suppliers of essential services such as Sydney Water Corporation (Sydney Water). The Independent Pricing and Regulatory Tribunal of NSW (IPART) conducts annual licence audits to ensure Sydney Water meets these obligations.

This is our report to the Minister on the 2020 operational audit as required under the *Sydney Water Act* 1994(Act).ⁱ In the 2020 annual audit, we audited Sydney Water's compliance with 42 clauses of the *Sydney Water* 2019-2023 *Operating Licence* (Licence)¹ during the period from 1 July 2019 to 30 June 2020 (audit period).

Key findings

We have summarised Sydney Water's compliance with audited clauses of the Licence in Table 1.1 below.

Liconco part	Number of	Compliance grade assigned				
	clauses			8	8	
Part 1 – Licence context	3	2	-	1	-	-
Part 2 – Licence authorisation	-	-	-	-	-	-
Part 3 – Water conservation and planning	8	5	-	1	2	-
Part 4 – Performance standards for water quality	4	-	4	-	-	-
Part 5 – Performance standards for service interruptions	7	4	-	3	-	-
Part 6 – Customers and consumers	8	8	-	-	-	-
Part 7 – Stakeholder cooperation	-	-	-	-	-	-
Part 8 – Information and services for competitors	2	-	-	-	-	2
Part 9 – Critical infrastructure security	-	-	-	-	-	-
Part 10 – Performance monitoring and reporting	10	8	1	1	-	-
Total	42	27	5	6	2	2

Table 1.1 Sydney Water's compliance in 2020, the first year of its 2019-2023 licence

Note: Section 2015 - Compliant; - Compliant (minor shortcomings); - Non-Compliant (non-material);

🐸 = Non-Compliant (material); 🕗 = No Requirement.

Source: 1) Atom Consulting, Sydney Water 2020 Operational Audit Report, February 2021 (Appendix D).

2) Report on clauses audited by IPART (Appendix E).

Our report presents an exception based summary of the audit. We discuss any audited clause which did not receive a "Compliant" grading in Chapter 2. For the full findings of the audit refer to the auditor's report in Appendix D and IPART's checks in Appendix E.

The 2020 audit found:

- Two Non-compliant (material) grades:
 - The audit found that Sydney Water had not implemented measures to reduce leakage that it assessed as being economic.
 - Sydney Water had not implemented all measures that it is responsible for delivering under the Metropolitan Water Plan.ⁱⁱ
- Six Non-compliant (non-material) grades:
 - Sydney Water continued to charge the Sydney Desalination Plant uplift charge for six weeks longer than allowed by the 2016 pricing determination. This was determined by IPART to be non-material and no further action was required.
 - Sydney Water's water conservation program lacked the aspects of a well-formed program, including justification and governance controls.
 - Sydney Water exceeded its performance target for unplanned water interruptions.
 - Sydney Water did not review all the identified low-water pressure property clusters in its business process review.
 - Sydney Water's Asset Management System had not been fully implemented, with a backlog of inspections and maintenance items needing to be undertaken.
 - Two aspects of Sydney Water's reporting obligations were inadequately provided in the 2020 Compliance and Performance reports.
- Five Compliant (minor shortcomings) grades:
 - Four related to Sydney Water's performance against its drinking water and recycled water obligations, being mainly gaps in documentation, and inconsistences in the currency of documents and Risk Matrix descriptors across different sites.
 - One related to minor shortcomings in document control and record keeping.

These issues are discussed in Table 2.1.

We make 23 recommendations to Sydney Water for clauses where we did not assign a fully Compliant grade.² All of these recommendations are set out in Chapter 1 and further discussed in Chapter 2.

The Tribunal will seek further information from Sydney Water before taking any further action on the Non-compliance (material) clauses, if any.

This audit also followed up on 6 recommendations arising from previous audits. We consider 5 of the 6 previous recommendations to be complete.

We consider that Sydney Water has adequately taken steps to progress the remaining incomplete recommendation. We will review Sydney Water's progress in closing out the remaining recommendation at the next operational audit.

² Consistent with the IPART Audit Guideline Public Water Utilities, July 2019, auditors are only required to make recommendations for grades other than Compliant, (ie for Compliant (minor shortcomings), Noncompliant (non-material) and Non-compliant (material) grades).

Our discussion of Sydney Water's progress with previous recommendations is presented in Chapter 3.

1 Introduction

The 2020 audit is the first operational audit of Sydney Water's compliance with the requirements of the Licence.

We engaged specialist auditing firm, Atom Consulting (Atom), to undertake the audit on our behalf. We have prepared this report to summarise the audit findings for the Minister for Water, Property and Housing, the Hon. Melinda Pavey MP.

1.1 Recommendations

We make the following 23 recommendations for the clauses where we did not assign a Compliant grade³ to Sydney Water to ensure that compliance with the Licence is maintained. These recommendations are based on the findings of the audit by our auditor Atom and should be read in conjunction with each of the relevant Licence clauses.

Recommendations

- **2020-01** By 28 February 2021 (in advance of the updating of charges for the next financial year), Sydney Water must review its operating procedures to ensure that they reflect the requirements relating to any uplift charges for the Sydney Desalination Plant (noting that the 1 July 2020 Determination has different mechanisms for the uplift charge) and update these procedures as required. Sydney Water should also conduct awareness raising around uplift charging requirements for relevant staff, where appropriate.
- **2020-02** Sydney Water must update the Water Conservation Report to include more information on the development, delivery and monitoring of the program. This should include more information on how projects are first identified from the wide range of potential options, assessment of project effectiveness and monitoring of benefits. Sydney Water must develop the structure of this report and content to be included in time for the next water conservation report for the 2020/21 year.
- **2020-03** By 30 June 2021, Sydney Water must demonstrate measures that have been taken in the 2020/21 financial year to improve its systems and processes used to deliver the water conservation program, including program monitoring and corrective action processes.
- **2020-04** Sydney Water must identify, assess, and include where appropriate measures for reducing leakage to below the economic level within its water conservation program. This should be completed for inclusion in the 2021/22 water conservation program.
- **2020-05** By 31 March 2021, Sydney Water must document the scope of the drinking water annual operational risk assessment reviews, to ensure a NSW Health representative is present during assessment of public health risks.

³ Compliant grade does not include Compliant (minor shortcomings) grade.

- **2020-06** By 30 June 2021, Sydney Water must review the Corporate Risk Matrix to rectify inconsistencies between Public Health and Injury /Illness consequence descriptors, including liaison with NSW Health.
- **2020-07** By 31 March 2021, Sydney Water must formalise the process for how the updated risk matrix and risk procedure is being implemented across water supply systems, including resolving inconsistencies in superseded documentation references, particularly noting the IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water procedure.
- **2020-08** By 30 June 2021, Sydney Water must establish processes for identifying and actioning improvement items identified in risk assessments to ensure timely resolution. After Sydney Water has established these processes, update the Product Management Improvement Framework.
- **2020-09** By 30 June 2021, Sydney Water must document the procedure for undertaking the recycled water annual operational risk assessment reviews.
- **2020-10** By 31 March 2021, Sydney Water must ensure risk assessment documentation (including workshop reports and the operational risk assessment procedure) refer to the current Risk Management Procedure and Risk Matrix.
- **2020-11** By 30 September 2021, Sydney Water must update critical control point documentation for the audited Water Recycling Plant (WRP) to document the basis for the chlorine contact tank (CCT) low flow critical control point.
- **2020-12** By 31 December 2021, Sydney Water must update scheme specific recycled water quality management plans that are scheduled for review in the next audit period to include reference to scheme specific documentation, including the audited Recycled Water Quality Management Plan. Include an action in the Recycled Water Improvement Register to update all scheme specific plans with this information at their scheduled review.
- **2020-13** By 31 December 2021, Sydney Water must update the recycled water audit schedule to ensure a yearly review of high risk AGWR elements at a number of recycled water schemes each year (as agreed with NSW Health). The schedule should be risk-based and consider locations and exposures. All recycled water schemes should be audited within a 3-year cycle.
- **2020-14** By 30 June 2021, Sydney Water must review and update the Product Management Improvement Framework to explicitly reference recycled water. Establish processes for identifying and actioning action items in risk assessment to ensure timely resolution and update the Product Management Improvement Framework.
- **2020-15** By 30 June 2021, Sydney Water must review permissions and limits in SCADA to ensure that changes outside critical limits can only be made in accordance with an appropriate change management procedure and that critical limits align with the critical control point documentation for all plants.
- **2020-16** By 30 June 2021, Sydney Water must formalise the review of recycled water verification report, to be explicit about the need to manually check that exceptions are included in the Irrigation Scheme Monthly reports, and train staff in the updates.
- **2020-17** By 30 June 2021, Sydney Water must provide updated analysis of its understanding of the relationship between prevailing weather conditions in the last five years, soil moisture and the impact on water main bursts, leaks and unplanned supply interruptions.

- **2020-18** By 31 December 2021, Sydney Water must complete lessons learned reports for the five largest unplanned water supply interruption events that occurred in 2019/20 and identify what measures could be implemented in future to reduce the number of properties impacted by future interruptions at these locations. Sydney Water should demonstrate how it has considered the application of these lessons learned across its entire network.
- **2020-19** By 31 March 2021, Sydney Water must update its business process manual to fully and accurately reflect low pressure clusters.
- **2020-20** By 31 December 2021, Sydney Water must review its inspection programs for all asset classes to incorporate lessons learned from its current inspection program for sewage pumping stations. The output should be an updated condition assessment strategy (or similar) document(s) that specifies the desired approach to condition assessment for all major asset classes including (but not limited to):
 - Consideration of risk of asset failure and consequence of failure
 - Frequency of inspection
 - Level of inspection (visual v detailed inspection) and situations where more detailed inspections are warranted
 - Inspection techniques
 - Resourcing and support considerations such as access and shutdowns.
- **2020-21** By 31 March 2021, Sydney Water must ensure that all information required for annual compliance reporting is provided, including: critical control breaches for all plants, whether automated or manually monitored; assessment of the performance of critical control points over the long term; and the proposed water quality management activities and programs, including expected outcomes, scope and timetable for completion.
- **2020-22** Sydney Water must include detailed and quantitative discussion on the drivers for observed performance and variances to historical performance for all Performance Standards in the Performance Standards Report. This should be implemented for each of the Performance Standards reports for the 2020/21 year. Under Sydney Water's Reporting Manual, the Performance Standards reports are due for submission by 1 September following the end of the relevant financial year (i.e. 1 September 2021).
- **2020-23** By 30 June 2021, Sydney Water must improve document control of the records held in its systems by ensuring that information such as the version date, version number, change history and document author are included in all records.

Refer to Table 2.1 for a comprehensive list of non-compliances and corresponding recommendations.

The compliance grades are explained in Appendix A. IPART's Reporting Manualⁱⁱⁱ requires Sydney Water to provide a report on its progress in implementing these recommendations by 31 March or at a later date agreed to by IPART. Due to the changed audit program in 2020, IPART requested that Sydney Water provides its progress report by 31 May 2021.

1.2 Sydney Water's operational performance in 2020

The 2020 audit results raise some concerns with Sydney Water's performance, most notably on water conservation. We note the Tribunal is further considering these non-compliances to determine whether formal action is required. The quality of water produced by Sydney Water continues to be of a high standard and to meet public health requirements.

1.3 Annual statement of compliance

In preparing this report we have also considered Sydney Water's annual Statement of Compliance (Appendix F). This is an exception-based report⁴ certified by the Managing Director and the Chairman of the Board of Directors of Sydney Water. It lists all Licence non-compliances identified by Sydney Water and what remedial action has been taken, or is being taken, to resolve these non-compliances.

This year Sydney Water reported one non-compliance with the Licence regarding its system performance standards, for properties that experience unplanned water interruptions that last for more than five continuous hours.

The non-compliance relates to Sydney Water exceeding the water continuity licence requirement of at least 9,800 Properties / 10,000 Properties unaffected by an Unplanned Water Interruption. Sydney Water reported that in 2019-20, there were 48,550 properties impacted by Unplanned Water Interruptions, which equates to 9,763 Properties / 10,000 Properties unaffected by an Unplanned Water Interruption.

The auditor reviewed this non-compliance, and noted that Sydney Water was also noncompliant in the 2018-19 audit period. The audit report notes that Sydney Water indicated that the prolonged dry conditions contributed to the failure against the standard. Based on the evidence provided by Sydney Water, the auditor concluded that the contravention was not material. Further information is set out in Table 2.1 and the auditor's report in Appendix D.

1.4 Progress with previous recommendations

Sydney Water had 6 recommendations outstanding from previous operational audits.

Commendably, Sydney Water completed 5 of the outstanding recommendations from previous operating audits. These relate to maintaining and implementing its drinking and recycled water quality management systems, as well as recommendations regarding an exceedance of the water continuity standard, and amending how it reports specific environmental indicators.

⁴ This means self-reporting only on those clauses where Sydney Water considers it is non-compliant.

One recommendation remains incomplete. The auditor noted that Sydney Water must complete the requirement to "establish a documented procedure for evaluating the chlorine solution used in the network maintenance activities and for evaluating the associated supplier(s)". The auditor noted that Sydney Water has taken steps to amend its procedures to include the approved chemical supplier and the quality assurance (QA) testing requirements. However, the QA form needs to be amended to reflect the specific requirements of the chlorine solution used by the network maintenance staff, and to provide evidence of a QA check of the selected supplier(s).

We have discussed all the previous recommendations further in Chapter 3.

1.5 Audit scope

The 2020 audit covered the period from 1 July 2019 to 30 June 2020.⁵ The full process we followed to undertake the audit is in Appendix B and the audit scope is in Appendix C.

⁵ The new operating licence was granted by the Minister on 1 November 2019. IPART and Sydney Water agreed to extend the audit period and report against the new licence conditions for the full financial year, instead of auditing against two licences for separate parts of the year.

2 Audit findings and recommendations

This Chapter provides an exception-based summary of Sydney Water's compliance with the audited clauses of the Licence. It explains the auditor's findings on audited clauses that did not receive the highest compliance grade (Compliant).

There were 2 material non-compliances under the 'water conservation and planning' clause. There were 6 non-material non-compliances relating to pricing, maintaining a water conservation program, breaching the water continuity standard for unplanned water interruptions, asset management, and administrative issues regarding an incomplete internal business process review, and shortcomings with certain reporting obligations. These issues require attention from Sydney Water to ensure compliance is maintained.

Sydney Water's recent historical audit performance is summarised below:

- 2017-18: one non-compliance (non-material) and two compliant (minor shortcomings) grades
- 2018-19: one non-compliance (non-material) and four compliant (minor shortcomings) grades
- 2019-2020 (current audit): 2 non-compliant (material), 6 non-compliant (non-material) and 5 compliant (minor shortcomings) grades.

We note that this is the first year of a new licence, with new licence clauses which do not correspond to the previous licence. We have therefore not included a clause-by-clause comparison.

Table 2.1 provides an audit exception summary (i.e. a summary of the non-compliances) and our reasoning for the assigned grade and any relevant recommendations.

The auditor has also identified some opportunities for improvement in Sydney Water's operational audit report, provided in Appendix D.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
1.7.1	 Sydney Water must set the level of fees, charges, and other amounts payable for its Services in accordance with: a) the terms of the Licence; b) the Act; and c) any applicable maximum prices or methodologies for fixing maximum prices determined under the IPART Act. 	Non-compliant (non-material)	We have assigned Sydney Water a Non- compliant (non-material) grade for clause 1.7.1. This agrees with the auditor's finding. Sydney Water continued to charge the Sydney Desalination Plant uplift charge for six weeks longer than permitted under the applicable pricing determination. IPART had previously identified the non- compliance.	2020-01: By 28 February 2021 (in advance of the updating of charges for the next financial year), Sydney Water must review its operating procedures to ensure that they reflect the requirements relating to any uplift charges for the Sydney Desalination Plant (noting that the 1 July 2020 Determination ⁶ has different mechanisms for the uplift charge) and update these procedures as required. Sydney Water should also raise awareness around uplift charging requirements for relevant staff, where appropriate.
3.1.1	Sydney Water must maintain a water conservation program consistent with the Current Economic Method.	Non-compliant (non-material)	We have assigned Sydney Water a Non- compliant (non-material) grade for clause 3.1.1. This agrees with the auditor's finding. The audit found that the water conservation program was lacking aspects of a well-formed program, including justification of the size and composition of the program. It lacked details on the governance and controls for identification and inclusion of projects within the program and monitoring their delivery and benefits. It also included a project that did not meet the economic criterion that the levelised cost be lower than the expected value of water without adequate explanation.	2020-02: Sydney Water must update the Water Conservation Report to include more information on the development, delivery and monitoring of the program. This should include more information on how projects are first identified from the wide range of potential options, assessment of project effectiveness and monitoring of benefits. Sydney Water must develop the structure of this report and content to be included in time for the next water conservation report for the 2020-21 year. 2020-03: By 30 June 2021, Sydney Water must demonstrate measures that have been taken in the 2020-21 financial year to improve its systems and processes used to deliver the water conservation program, including program monitoring and corrective action processes.

Table 2.21 2020 compliance with Sydney Water's Licence – grades other than fully Compliant

⁶ IPART, *Prices for Sydney Desalination Plant Pty Ltd's Water Supply Services*, 1 July 2017 to 30 June 2022.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
3.1.2	Sydney Water must implement water conservation measures that have been assessed as economic as determined by the Current Economic Method.	Non-compliant (material)	 We have assigned Sydney Water a Noncompliant (material) grade for clause 3.1.2. This agrees with the auditor's finding. The auditor found that Sydney Water 'has not implemented an option to reduce leakage that it assessed as being economic (the enhanced leak response initiative)'. The auditor noted that: of 6 projects identified for implementation, 3 did not incur any expenditure in 2019/20 of the 1,115 ML of new water savings forecast for 2019/20, only 368 ML were achieved Sydney Water did not follow through on its commitments despite the severe and worsening drought Sydney Water's leakage performance exceeded the economic level since 2015/16 Sydney Water did not appear to have considered all options available to it for inclusion in its Water Conservation Plan. The auditor commented that 'the magnitude by which Sydney Water under-delivered is substantial – only one third of the benefits expected were achieved'. The auditor concluded that the under-delivery of the program and the period of time that the economic level of leakage had been exceeded resulted in a material non-compliance. 	2020-04: Sydney Water must identify, assess, and include where appropriate measures for reducing leakage to below the economic level within its water conservation program. This should be completed for inclusion in the 2021-22 water conservation program. The Tribunal will consider whether further action is required under the Act.
3.2.4	Sydney Water must implement any action that:	8	We have assigned Sydney Water a Non- compliant (material) grade for clause 3.2.4. This agrees with the auditor's finding.	Recommendation 2020-04 addresses the deficiency related to implementing the water conservation program.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
	 a) Sydney Water is responsible for delivering under the Metropolitan Water Plan; or b) the Minister directs, in writing, Sydney Water to implement. 	Non-compliant (material)	The auditor considered that Sydney Water had provided sufficient evidence to demonstrate its compliance with most of the requirements of the Metropolitan Water Plan and the directions of the Minister. However, it is also required under that Plan to implement its water conservation program. As the auditor has assigned a grade of non- compliant (material) for clause 3.1.2, this clause is also non-compliant (material).	
4.1.1	Sydney Water must maintain a Management System that is consistent with the Australian Drinking Water Guidelines (ADWG) and any requirements relating to Drinking Water specified by NSW Health (the Drinking Water Quality Management System).	Compliant (minor shortcomings)	 We have assigned Sydney Water a Compliant (minor shortcomings) grade for clause 4.1.1. This agrees with the auditor's finding. The auditor assessed consistency with elements 2-7 and 10 -12 of the ADWG. The following shortcomings were identified: Gaps in documentation on the annual operational review process, particularly around: The extent of changes to risk ratings that can be made without external stakeholder involvement, and Requirements for NSW Health representative to be present when reviewing public health risks Inconsistencies in the risk matrix across public health and injury/illness consequence descriptors Inconsistencies in the currency of risk procedure documentation, e.g. some procedures refer to superseded documents Emergency and incident contact lists were not current 	2020-05: By 31 March 2021, Sydney Water must document the scope of the drinking water annual operational risk assessment reviews, and ensure a NSW Health representative is present during assessment of public health risks. 2020-06: By 30 June 2021, Sydney Water must review the Corporate Risk Matrix to rectify inconsistencies between Public Health and Injury /Illness consequence descriptors, including liaison with NSW Health. 2020-07: By 31 March 2021, Sydney Water must formalise the process for how the updated risk matrix and risk procedure is being implemented across water supply systems, including resolving inconsistencies in superseded documentation references, particularly noting the IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water procedure.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
4.1.3	Sydney Water must ensure that the Drinking Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Drinking Water Quality Management System and to the satisfaction of NSW Health.	Compliant (minor shortcomings)	We have assigned Sydney Water a Compliant (minor shortcomings) grade for clause 4.1.3. This agrees with the auditor's finding. Our auditor noted that Sydney Water has implemented its Drinking Water Quality Management System with the exception of two minor shortcomings: Public health risk rankings were changed in the audited Water Filtration Plant annual operational risk review, contrary to the requirement that NSW Health should be present when public health risks are assessed Delays in transferring improvement action items identified in the risk assessment to appropriate risk registers.	Recommendation 2020-05 addresses the deficiency related to ensuring a NSW Health representative is present when public health risks are assessed during operational risk reviews. 2020-08: By 30 June 2021, Sydney Water must establish processes for identifying and actioning improvement items identified in risk assessments to ensure timely resolution. After Sydney Water has established these processes, update the Product Management Improvement Framework.
4.2.1	Sydney Water must maintain a Management System that is consistent with the Australian Guidelines for Water Recycling (AGWR) and any requirements relating to water recycling specified by NSW Health (the Recycled Water Quality Management System).	Compliant (minor shortcomings)	 We have assigned Sydney Water a Compliant (minor shortcomings) grade for clause 4.2.1. This agrees with the auditor's finding. Our auditor assessed consistency with elements 2-7 and 10 -12 of the AGWR. The following shortcomings were identified: Gaps in documentation on the annual operational review process Inconsistencies in currency of risk procedure documentation Lack of documentation on the basis of the low chlorine contact tank (CCT) flow critical control point at the audited Water Recycling Plant (WRP) Gaps in referencing appropriate site- specific documents in the scheme recycled water quality managements plans 	 2020-09: By 30 June 2021, Sydney Water must document the procedure for undertaking annual recycled water operational risk assessment reviews. 2020-10: By 31 March 2021, Sydney Water must ensure risk assessment documentation (including workshop reports and the operational risk assessment procedure) refer to the current Risk Management Procedure and Risk Matrix. 2020-11: By 30 September 2021, Sydney Water must update critical control point documentation for the audited WRP to document the basis for the CCT low flow critical control point.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			 No evidence provided on the basis for the scheduling of internal recycled water quality management plan audits The Product Management Improvement Framework focussed on drinking water and was missing explicit references to recycled water. 	2020-12: By 31 December 2021, Sydney Water must update scheme specific referencing in recycled water quality management plans that are scheduled for review in the next audit period, including the audited Recycled Water Quality Management Plan. Include an action in the Recycled Water Improvement Register to update all scheme specific plans with this information at their scheduled review. 2020-13: By 31 December 2021, Sydney Water must update the recycled water audit schedule to ensure an annual review of high risk AGWR elements at a number of recycled water schemes each year (as agreed with NSW Health). The schedule should be risk- based and consider locations and exposures. All recycled water schemes should be audited within a 3-year cycle. 2020-14: By 30 June 2021, Sydney Water must review and update the Product Management Improvement Framework to (1) explicitly reference recycled water and (2) establish processes for identifying and actioning action items in risk assessment to ensure timely resolution.
4.2.3	Sydney Water must ensure that the Recycled Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Recycled Water Quality Management System and to the satisfaction of NSW Health.	Compliant (minor shortcomings)	We have assigned Sydney Water a Compliant (minor shortcomings) grade for clause 4.2.3. This agrees with the auditor's finding. Our auditor noted that Sydney Water has implemented its Recycled Water Quality Management System with the exception of the following minor shortcomings:	2020-15: By 30 June 2021, Sydney Water must review permissions and limits in SCADA to ensure (1) that changes outside critical limits can only be made in accordance with an appropriate change management procedure and (2) that critical limits align with the critical control point documentation for all plants.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			 SCADA⁷ critical limit for low flow CCT at the audited WRP were set incorrectly Range of permissions to change the flow CCT critical control points and the bypass flow critical limit were set inconsistent with the critical limits Errors in verification monitoring reporting. 	2020-16: By 30 June 2021, Sydney water must formalise the review of the recycled water verification report, to be explicit about the need to manually check that exceptions are included in the Irrigation Scheme Monthly reports, and train staff in the updates.
5.1.1	Sydney Water must ensure that, in each financial year, at least 9,800 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service unaffected by an Unplanned Water Interruption (the Water Continuity Standard).	Non-compliant (non-material)	We have assigned Sydney Water a Non- compliant (non-material) grade for clause 5.1.1. This agrees with the auditor's finding. In 2019-20, there were 48,550 properties impacted by Unplanned Water Interruptions. This equates to 9,763 properties per 10,000 properties unaffected by an Unplanned Water Interruption which is below the minimum standard of 9,800 properties per 10,000 properties. Sydney Water self-reported this non-compliance. Sydney Water noted that the prolonged dry conditions in the first half of 2019-20 contributed to the failure against the standard. Two large breaks on critical water mains accounted for around 10,000 properties or 25% of the total number of properties reported for the Water Continuity Standard.	 2020-17: By 30 June 2021, Sydney Water must provide updated analysis of its understanding of the relationship between prevailing weather conditions in the last five years, soil moisture and the impact on water main bursts, leaks and unplanned supply interruptions. 2020-18: By 31 December 2021, Sydney Water must complete lessons learned reports for the five largest unplanned water supply interruption events that occurred in 2019-20 and identify what measures could be implemented in future to reduce the number of properties impacted by future interruptions at these locations. Sydney Water should demonstrate how it has considered the application of these lessons learned across its entire network.
5.2.5	For each Property Cluster, Sydney Water must:	Non-compliant (non-material)	We have assigned Sydney Water a Non- compliant (non-material) grade for clause 5.2.5. This agrees with the auditor's finding.	2020-19: By 31 March 2021, Sydney Water must update its business process manual to fully and accurately include low pressure clusters.

⁷ Supervisory control and data acquisition (SCADA) is a system of software and hardware elements that enable control and monitoring.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
	 a) by 30 June 2020, review its business processes to ensure that no Property at risk of being affected by recurring Water Pressure Failures from the same cause is connected to Sydney Water's Drinking Water supply system, unless the owner (at the time of connection) is: i. informed of that risk; and ii. provided with options to reduce that risk 		Sydney Water provided evidence that the relevant business process, the <i>Watermain</i> connections staff guide was updated within its business systems before 30 June 2020. The auditor found that the business process review omits two of the low-pressure clusters that have been identified through reporting against the performance standard and is therefore non-compliant against this obligation. The auditor considered that the non-compliance is non-material, given that the total number of properties in these clusters (13 properties) is equal to 16% of the total number of properties across all clusters. (83 properties).	
5.5.2	Sydney Water must ensure that the Asset Management System is fully implemented and that all relevant activities are carried out in accordance with the Asset Management System.	Non-compliant (non-material)	We have assigned Sydney Water a Non- compliant (non-material) grade for clause 5.5.2. This agrees with the auditor's finding. The auditor found that the Asset management System was not fully implemented. The audit noted that there was a backlog of inspections for sewage pumping stations, and recent experience had identified that catch-up inspections were identifying a material number of assets in poor and very poor condition. These are typically ancillary items which present a relatively low risk to Sydney Water achieving its asset management objectives. On this basis, the auditor found the non-compliance to be non-material.	 2020-20: By 31 December 2021, Sydney Water must review its inspection programs for all asset classes to incorporate lessons learned from its current inspection program for sewage pumping stations. The output should be an updated condition assessment strategy (or similar) document(s) that specifies the desired approach to condition assessment for all major asset classes including (but not limited to): a) consideration of risk of asset failure and consequence of failure b) frequency of inspection c) level of inspection (visual v detailed inspection) and situations where more detailed inspections are warranted d) inspection techniques e) resourcing and support considerations such as access and shutdowns.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
10.2.2	 Sydney Water must comply with all of its reporting and auditing obligations set out in the Reporting Manual, including in relation to: a) water conservation and planning; b) performance standards for water quality c) performance standards for service interruptions; d) Customers and Consumers; e) information and services for competitors; f) critical infrastructure security; and g) performance monitoring and reporting. 	Non-compliant (non-material)	We have assigned Sydney Water a Non- compliant (non-material) grade for clause 10.2.2. This agrees with the auditor's finding. Two aspects of this clause were found to be non-compliant non-material. When reporting performance standards for service interruptions (sub-clause c), Sydney Water did not provide information on major drivers for observed performance and variances to historical performance. Sydney Water also did not report on the performance of critical control points (CCP) in the annual compliance and performance report for recycled water (sub-clauses b and g). Based on the evidence sighted, Sydney Water did comply with reporting obligations to report CCP exceedances to NSW Health for drinking and recycled water.	 2020-21: By 31 March 2021, Sydney Water must ensure that all information required for annual compliance reporting is provided, including: critical control breaches for all plants, whether automated or manually monitored; assessment of the performance of critical control points over the long term; and the proposed water quality management activities and programs, including expected outcomes, scope and timetable for completion. 2020-22: Sydney Water must include detailed and quantitative discussion regarding the drivers for observed performance for all Performance Standards Report. This should be implemented for the next Performance Standards Report which will be for the 2020/21 year. Under Sydney Water's Reporting Manual, the Performance Standards Report is due for submission by 1 September following the end of the relevant financial year (i.e., 1 September 2021).
10.2.4	Sydney Water must maintain sufficient record systems to enable Sydney Water to report accurately in accordance with this clause 10.2.	Compliant (minor shortcomings)	We have assigned Sydney Water a Compliant (minor shortcomings) grade for clause 10.2.4. This agrees with the auditor's finding. The auditor considered that Sydney Water had maintained sufficient record systems to enable it to report accurately in accordance with clause 10.2. However, there were minor shortcomings in document control and record keeping.	2020-23: By 30 June 2021, Sydney Water must improve document control of the records held in its systems by ensuring that information such as the version date, version number, change history and document author are included in all records.

Source: Atom Consulting, Sydney Water 2020 Operational Audit, February 2021.

3 Progress on previous audit recommendations

Previous audits identified areas where Sydney Water was not fully compliant with the Licence obligations. We made recommendations to Sydney Water to address these issues.^{iv} The following table outlines Sydney Water's progress in implementing these recommended actions.

Sydney Water has fully implemented 5 of the 6 outstanding audit recommendations. The other recommendation is being progressed. The previous recommendations are shown in Table 3.1.

	Recommendation	Progress
2019-01	Water Quality (Drinking water) clause 2.1.1 By 30 June 2020, establish a documented procedure for evaluating the chlorine solution used in the networks maintenance activities and for evaluating the associated supplier(s).	Ongoing Work is underway to obtain chlorine solution, used in network maintenance activities, through Sydney Water's centrally managed bulk chemical supply agreements. This process has been documented in the procurement procedure for chemical supply. However, evidence of the QA check of the supplier has not been provided for the audit period, and the QA form should reflect the specific chemical requirements. This recommendation remains open and will be checked for completion at the next operational audit.
2019-02	Water Quality (Drinking water) clause 2.1.2 By 30 June 2020, ensure calibration records associated with the work instruction, HACH 2100P Series Portable Turbidimeter – Calibration and Maintenance, are appropriately maintained to demonstrate that the required calibrations are undertaken at the specified frequency as per the work instruction.	Complete
2019-03	Water Quality (Drinking water) clause 2.1.2 By 30 June 2020, ensure internal key performance indicator reporting outlined in the Drinking Water Product Specifications (IMS0152.01) is undertaken as required. The following actions are to be implemented:	Complete

Table 3.1Sydney Water's progress in 2020 to address our recommendations from the
previous audits

	Recommendation	Progress
	 A review of the target criteria for cross- connection management in the Drinking Water Product Specifications (IMS0152.01) is to be undertaken to ensure that new and established residential property cross-connection rates are at a level that prevents unacceptable exposure (nominally 1/1000 houses). Appropriate monitoring of the targets must be established. The review must be undertaken in consultation with NSW Health. 	
2019-04	 Water Quality (Recycled water) Clause 2.2.1 By 31 March 2020, ensure the recycled water risk assessments are more detailed to manage risk effectively. The following actions are to be undertaken: All possible modes of failure are to be assessed through the identification of hazards and hazardous events, although these may be grouped. Specific actions or procedures are identified as preventive measures to ensure the measure is understood, communicated and auditable. Significant risks should be clearly identified, to ensure preventive measures are in place and prioritised accordingly. Areas of uncertainty are to be identified to ensure that there is continual improvement in the risk assessment process. These are to be implemented for the next revision of the Wollongong Stages 1 and 2 risk assessments. 	Complete
2019-05	Water Continuity Standard Clause 4.2.2 By 31 March 2020, Sydney Water is to complete a formal debrief (including a root cause analysis) on the Punchbowl water main break to identify and develop more effective monitoring arrangements to enable timely identification of operational conditions that may affect its performance against the Water Continuity Standard.	Complete
2019-06	Environmental indicators Clause 6.2.1 By 30 June 2020 Sydney Water is to amend its reporting of indicator E1 and E2 to include electricity consumption and renewable electricity generation by build-own-operate-transfer (BOOT) contractors.	Complete

Source: 1) Sydney Water 2020 Operational Audit, Atom Consulting, February 2021 (Appendix D).

Appendix

A Compliance grades

Grades of compliance		Description		
	Compliant	Sufficient evidence is available to confirm that the requirements have been met.		
0	Compliant (minor shortcomings)	Sufficient evidence is available to confirm that the requirements have been met apart from minor shortcomings which to date have not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.		
8	Non-compliant (non-material)	Sufficient evidence is not available to confirm that the requirements have been met and the deficiency does not adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.		
8	Non-compliant (material)	Sufficient evidence is not available to confirm the requirements have been met and the deficiency does adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.		
	No Requirement	There is no requirement for the utility to meet this criterion within the audit period.		

Table A1: Current compliance grades

Source: IPART Audit Guideline Public Water Utilities, July 2019, Figure 2.1.

B Audit process

B.1 Audit programme

In developing our annual audit scopes for Sydney Water we apply IPART's *Compliance and Enforcement Policy, December 2017.* This policy sets out our risk-based regulatory model. Under this policy, we can:

- focus on allocating resources to areas of higher risk
- increase our efficiency
- tailor our enforcement response.

We base our risk-based approach on evaluating the risk that each part of our regulatory function aims to reduce. We evaluate the risk by considering the likelihood of harm occurring in the absence of our regulatory controls and the potential consequence of that harm. We then consider how likely it is that a regulated entity will not properly implement a regulatory control.

We identify and document historical, current and emerging risks. This allows allocation of resources in proportion to the risk and complexity of regulated entities and behaviours.

The audit process involves receiving and reviewing reports, undertaking and attending audit interviews with Sydney Water staff, and undertaking field verification to investigate how effectively the requirements of the licence are met in practice. This year, we undertook these interviews and field verification visits remotely.

B.2 2020 audit scope

We do not audit every licence clause each year, instead we adopt a risk-based audit approach. This means we audit 'high risk' clauses more frequently and 'low risk' clauses less frequently, while generally ensuring even low-risk clauses are audited once during the term of a licence. We conduct audits in accordance with our *Audit Guideline – Public Water Utilities* (Audit Guideline) which is available on our website.

This audit was the first under the new Licence and most of the licence obligations were audited. Following the risk-based approach, the audit scope for this year included licence obligations on:

- Licence context (Part 1) requirements on licence availability, area of operations and pricing.
- Water conservation and planning (Part 3) requirements on water conservation and water planning activities.
- Performance standards for water quality (Part 4) requirements on drinking water and recycled water.

- Performance standards for service interruptions (Part 5) requirements on service continuity and system performance standards, and asset management systems.
- Customers and consumers (Part 6) requirements on providing information, assistance options for payment difficulties and actions for non-payments, family violence policy, review of the operation of the customer council, and external dispute resolution.
- Information and services for competitors (Part 8) requirements on negotiating with competitors and use of codes of conduct.
- Performance monitoring and reporting (Part 10) requirements on information provision and reporting.

We consulted with NSW Health, Environment Protection Authority (EPA), Fire and Rescue NSW (FRNSW), and Department of Planning, Industry and Environment (DPIE) and sought public submissions in determining the scope of the audit. We have included the audit scope in Appendix C.

We had regard to the following comments in finalising the audit scope:

- NSW Health identified the following areas of interest:
 - Potential risks related to backflow and cross connection of drinking water services (considered in the review of licence clauses 4.1.3 and 4.2.3).
 - Whether the new risk assessment matrix appropriately reflects the public health risk posed by Sydney Water's operations (considered in the review of licence clause 4.1.1 and 4.2.1).
 - Whether the work to align risk methodologies with the Build Own Operate Transfer (BOOT) partners is still applicable with Sydney Water's new matrix, including how improvements can be prioritised across all systems for action (considered in the review of licence clause 4.1.1 and 4.2.1).
 - Review the progress of work to improve water quality management at the Nepean water filtration plant (considered in the review of licence clause 4.1.3).
- EPA commented that:
 - Sydney Water is the subject of several regulatory actions in connection with the effective operation and maintenance of its systems.
 - Sydney Water's Environment Protection Licences (EPLs) contain several performance requirements relating to dry weather overflows and wet weather overflows, which Sydney Water breached during the year.
 - EPA has, or intends to, place Pollution Reduction Programs on several of Sydney Water's EPL's.⁸
- FRNSW commented that:
 - There have been positive outcomes from its ongoing discussions with Sydney Water, but noted that work still remains on developing clear strategies and policy positions that would enable the efficient and effective provision of firefighting water throughout the Sydney Water network over the longer term.

⁸ We considered this information generally in the review of licence clauses 5.3.1 and 5.5.2, as these issues are already being addressed by EPA).

- FRNSW seeks a comprehensive report detailing the entire network's performance with regard to availability of water for firefighting.⁹
- DPIE noted that:
 - Sydney Water has put in place the data sharing agreement as required under licence clauses 3.2.6-3.2.8.
 - The Department is satisfied that it is meeting its obligations under that agreement.

We received no submissions from members of the public on the 2020 audit scope.

B.3 2020 audit plan

We engaged Atom to undertake the 2020 Sydney Water audit.

We held a project start-up meeting with the auditor on 8 July 2020 to agree on the project milestones, audit timing, and outline our expectations. We participated in the audit inception meeting with Sydney Water and the auditor on the first day of the audit interviews on 27 October 2020. At this meeting, we agreed on expectations and protocols for the conduct of the audit. All parties adhered to the agreed protocols throughout the audit.

We required the auditor to undertake the following tasks:

- 1. Receive stakeholder submissions and comments for inclusion in the audit scope
- 2. Prepare an information request (questionnaire) setting out all the requirements for information and evidence, at least two weeks prior to the commencement of audit interviews (for this audit, the auditor issued the questionnaire 12 weeks before the audit interviews commenced)
- 3. Review reports and documents provided by Sydney Water in response to the questionnaire
- 4. Conduct interviews with Sydney Water staff at its offices
- 5. Conduct field verification and assess the implementation of Sydney Water's systems and procedures
- 6. Assess the level of compliance (according to our compliance grades) Sydney Water achieved for each of the identified obligations of the licence and provide supporting evidence for this assessment
- 7. Assess and report on progress by Sydney Water in addressing any comments made by the relevant Minister and/or our recommendations from previous audits, providing supporting evidence for these assessments
- 8. Verify the calculation of performance indicators associated with requirements of the relevant licence and assess trends in performance arising from these indicators
- 9. Provide drafts of the audit report to us and address comments from Sydney Water and IPART regarding draft audit findings

⁹ Given the positive basis of the relationship, and that we audited the relevant clauses last year, we did not consider including any additional licence clauses to this year's audit, noting that under the risk-based framework, we will re-audit these clauses in 2021.

10. Prepare a final report outlining audit findings (Appendix D).

Our auditor adopted a methodology consistent with *ISO 19011 Guidelines for Auditing Management Systems*. This guideline defines the requirements of an audit, ensuring that it is conducted in accordance with an established and recognised audit protocol. Where appropriate, the auditor also sought guidance from *ISO 55001:2014 Asset management system* – *Requirements*.

Our auditor also carried out the audit according to our *Audit Guideline - Public Water Utilities*, *July 2019.*¹⁰ Under this guideline, the auditor can make recommendations or suggest opportunities for improvement.

Where we support an auditor's recommendation, we make our recommendation based on the auditor's recommendation. Our recommendations are summarised in section 1.1 of this report.

Where the auditor suggested opportunities for improvement, Sydney Water can decide whether to implement these suggestions. This approach should balance improved performance with the investment required to achieve it. That is, we want Sydney Water to first consider the pricing implications and value for money of continued improvement. As a consequence, while we encourage Sydney Water to consider the auditor's suggestions, we do not follow these up. The auditor's suggested opportunities for improvement are included in the auditor's report in Appendix D.

Our auditor conducted audit interviews from 27 to 29 October 2020 through the use of videoconferencing. On 28 October 2020, the auditor also undertook a site visit to the following locations:

- Nepean Water Treatment Plant
- West Camden Water Recycling Plant
- Water pumping station Prospect
- Sewer pumping stations Prospect and Camellia
- Valve maintenance Prospect

Our auditor assessed Sydney Water's compliance with the relevant requirements of the Licence as per the compliance grades outlined in Appendix A.

¹⁰ Available on our website (https://www.ipart.nsw.gov.au). The latest version of the Audit Guidelines was released in July 2019.

C 2020 Audit scope

2020 operational audit scope Sydney Water Corporation

2020 audit scope

This document sets out the 2020 operational audit scope for Sydney Water Corporation (Sydney Water).

Auditors should note any directions in the comments column of Table 2.

Audit period

The audit period is 1 July 2019 to 30 June 2020. Sydney Water will be audited for the full period against the 2019-2023 operating licence. We expect that interviews for the audit will be held in September 2020. However, this is subject to change depending on auditor availability.

Outstanding audit recommendations

Table 3 outlines outstanding audit recommendations. The auditor is required to review these recommendations to determine progress. We report on outstanding audit recommendations separately within IPART's operational audit report to the Minister.

Statement of compliance

The utility is required to provide a Statement of Compliance (SC), signed by the CEO and a Board Member, by 1 September. The SC is an exception based report that outlines any non-compliance with licence conditions during the previous financial year. It also identifies what remedial action has been, or is being taken, with respect to these non-compliances.

The SC covers all licence conditions regardless of whether they are scheduled to be audited in that year. The SC may cause a late variation to the audit scope to allow non-compliances to be reviewed if necessary.

Interpretation

In the case of any discrepancies between the Sydney Water Operating Licence 2019-2023 (licence) and the audit scope, the licence will prevail.

Field verification locations

Table 4 lists the locations that we have visited in previous audits. Together with Sydney Water, we will determine the locations that we will visit in the 2020 audits and advise the auditor before the field verification visits are scheduled to commence.

Table 1 Key

Requirement	Meaning
Audit/Internal IPART check	Audit/check clause in the 2020 audit
SC	Audit of this clause not required in the 2020 audit unless the utility's Statement of Compliance identifies a non-compliance or we become aware of other reasons to audit the clause.
NR	No requirement for audit.

Table 2 2020 Audit scope for Sydney Water Corporation

Licence clause	• Operating Licence obligation			2020 audit requirement	Comments for the auditor
1	Licence a	and lice	nce authorisation		
1.1	Objectives of this licence				
1.1.1	The objectives of this Licence are to:			NR	Objective clause
	a) au wi	ıthorise thin its	e and require Sydney Water, Area of Operations, to:		
		i.	store or supply water		
		ii.	provide sewerage services		
		iii.	provide Stormwater Drainage Systems; and		
		iv.	dispose of Wastewater; and		
	b) se co pe Sy wa	et efficie ondition erforma /dney V ay that:	ent and effective terms and s, including quality and nce standards, that require Vater to provide services in a		
		i.	supports its principal objectives under the Act to protect public health and the environment;		
		ii.	supports its principal objective under the Act to be a successful business, including by having regard to the interest of the community; and		
		iii.	does not prevent or hinder competition.		
1.2	Area of operations				
1.2.1	This Licence applies to the Area of Operations specified in Schedule A.			NR	Information clause
1.2.2	Sydney Water must publish on its website a map of its Area of Operations by 31 December 2019 (or another date approved by IPART in writing). Sydney Water must update the map within 30 days of any change to its Area of Operations.			Internal IPART check	This clause is not included in the auditor's scope.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
1.3	Term of this licence		
1.3.1	The term of this Licence is four years from the Commencement Date.	NR	Information clause
	[Note: On and from the Commencement Date, this Licence replaces any previous version of the operating licence granted to Sydney Water under section 12 of the Act.]		
1.4	Licence amendment		
1.4.1	Subject to the Act and clause 1.4.2, the Governor may amend or substitute this Licence by notice in the New South Wales Government Gazette.	NR	
1.4.2	Before notice of a proposed amendment to this Licence is tabled in Parliament under section 16 of the Act, the Minister must provide Sydney Water with reasonable notice of the proposed amendment to enable it to comply with the amendment if it takes effect.	NR	
	in accordance with section 59 of the Act and clause 14.2 of the Customer Contract. Such a variation is not an amendment to this Licence for the purpose of section 16 of the Act.].		
1.5	Non-exclusive licence		
1.5.1	This Licence does not prohibit any other person from providing services in the Area of Operations that are the same as, or similar to, the Services, if the person is lawfully entitled to do so.	NR	Information clause
1.6	Availability of licence		
1.6.1	Sydney Water must make a copy of this Licence available to any person, free of charge:	Internal IPART check	This clause is not included in the auditor's scope.
	b) upon request made to the Contact Centre.		
1.7	Pricing		
1.7.1	Sydney Water must set the level of fees, charges, and other amounts payable for its Services in accordance with:	Audit	
	a) the terms of the Licence;		
	b) the Act; and		
	 c) any applicable maximum prices or methodologies for fixing maximum prices determined under the IPART Act. 		

Licence clause	Operating Licence obligation			2020 audit requirement	Comments for the auditor
1.8	End of Term F	Review			
1.8.1	IPART intends year to investi	s to review this L gate:	icence in its final	NR	Information clause
	a) whether objective	this Licence is fes; and	ulfilling its		
	b) any issu term of t effective	es that have aris his Licence that ness,	en during the may impact its		
	(the End of Te	erm Review).			
1.8.2	To assist IPART with the End of Term Review, Sydney Water must provide IPART with such information as IPART reasonably requires. Sydney Water must provide IPART with such information as IPART requests within a reasonable time.			NR	
1.9	Notices				
1.9.1	Any notice or under this Lice a) in writing	other communic ence must be: g addressed to th	ation given ne intended	NR	
	b) delivered specified notified b otherwis Manual.	d or sent to one of below (or the la by the recipient), e specified in the	of the addresses ast address unless e Reporting		
	Sydney Water	Minister	IPART		
	Sydney Water The Managing Director Sydney Water 1 Smith Street Parramatta NSW 2150	The Hon. Melinda Pavey MP GPO Box 5341 Sydney NSW 2001	The Chief Executive Officer Independent Pricing and Regulatory Tribunal Level 15, 2-24 Rawson Place Sydney NSW 2000		
1.9.2	Any requests for approval under the following clauses must be made by Sydney Water's Managing Director: 1.2.2, 3.1.7, 3.2.1, 3.2.6, 6.5.1, 6.6.6, 8.2.2, 8.2.3, 8.2.5, 8.2.6, 9.1.1, 8 or 9.3.1.			NR	

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
2.1	Licence authorisations		
2.1.1	This Licence authorises and requires Sydney Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems and services for providing the following Services within the Area of Operations:	NR	Licence authorisation clause
	b) providing soworage services: and		
	b) providing sewerage services, and		
	c) disposing of wastewater.		
2.1.2	This Licence authorises and requires Sydney Water to provide, operate, manage and maintain a Stormwater Drainage System as described in section 14(1)(b) of the Act, except to the extent that the Minister is satisfied under sections 14(4) and 14(5) of the Act that satisfactory arrangements have been made for the applicable Service to be provided by another appropriate body.	NR	Licence authorisation clause
2.1.3	This Licence authorises (but does not require) Sydney Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable Stormwater Drainage Systems (and Services for providing those Stormwater Drainage Systems) within the Area of Operations in excess of the Stormwater Drainage System it is required to provide, operate, manage and maintain under clause 2.1.2. This includes increasing the capacity of the Stormwater Drainage System included in the business undertaking transferred under Part 3 of the Act from the Water Board to Sydney Water as at the date of the transfer of the business undertaking. [Note: For the avoidance of doubt, the provision, management and maintenance of Stormwater Drainage Systems (and Services for providing those Stormwater Drainage Systems) under clause 2.1 may include stormwater quality management and other measures as necessary to manage impacts of stormwater on waterway health.]	NR	Licence authorisation clause
2.2	Obligation to make services available		
2.2.1	Sydney Water must ensure that Services for the supply of Drinking Water and disposal of Wastewater are available on request for connection to any Property situated in the Area of Operations for which a connection is available.	SC	
Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
-------------------	---	------------------------	------------------------------------
2.2.2	Sydney Water must provide Services for the supply of Drinking Water and disposal of Wastewater on request to any licensee under the WIC Act, where that licensee is connected to (or where a connection is available in respect of that licensee to) Sydney Water's water supply system or sewerage system.	SC	
2.2.3	Connection to Sydney Water's systems for the provision of Services for the supply of Drinking Water and disposal of Wastewater is subject to any reasonable conditions that Sydney Water may determine to ensure the safe, reliable and financially viable supply of Drinking Water and disposal of Wastewater to Properties.	NR	Authorisation clause
3.1	Economic approach for water conservation		
3.1.1	Sydney Water must maintain a water conservation program consistent with the Current Economic Method.	Audit	
3.1.2	Sydney Water must implement water conservation measures that have been assessed as economic as determined by the Current Economic Method.	Audit	
3.1.3	Sydney Water must make:	Internal IPART	This clause is not included in the
	a) a copy of the Current Economic Method;	спеск	auditor's scope.
	 b) a plain English summary of the Current Economic Method; and 		
	 c) the economic level of water conservation (expressed as the value of water in dollars per kilolitre and as the quantity of savings in megalitres per day) determined in accordance with the Current Economic Method, available: 		
	 d) to any person, free of charge upon request made to the Contact Centre; and 		
	e) on Sydney Water's website.		
3.1.4	Sydney Water must update the economic level of water conservation using the Current Economic Method:	Audit	
	 a) for the purposes of clause 3.1.1 and 3.1.2—annually; and 		
	b) or the purposes of clause 3.1.3(c)— monthly.		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
3.1.5	The Minister may, at any time during the term of this Licence and in writing, direct Sydney Water to revise the Current Economic Method in any way the Minister requires.	NR	Information clause
	[Note: The Minister may request IPART to undertake a review of the Current Economic Method during the term of this Licence. Such review may precede a direction given under clause 3.1.5.]		
3.1.6	Sydney Water must submit to the Minister the Current Economic Method revised in accordance with the written direction within:	SC	
	a) 30 days of receipt of that direction; or		
	 b) any other timeframe agreed by the Minister. 		
3.1.7	If the Minister approves the revised Current Economic Method, he or she will give written notice of the approval to Sydney Water.	NR	Information clause
3.2	Water Planning		
3.2.1	By 1 December 2020 (or another date approved by the Minister in writing), Sydney Water must develop, and submit to the Minister:	NR	
	 a long-term capital and operational plan; and 		
	b) an emergency drought response plan.		
3.2.2	The plans referred to in clause 3.2.1 must address any written guidance that the Minister provides to Sydney Water	NR	
3.2.3	Sydney Water must use its best endeavours to develop the plans referred to in clause 3.2.1 in cooperation with Water NSW.	NR	
3.2.4	Sydney Water must implement any action that:	Audit	
	 a) Sydney Water is responsible for delivering under the Metropolitan Water Plan; or 		
	 b) the Minister directs, in writing, Sydney Water to implement. 		
3.2.5	Sydney Water must participate cooperatively in any review of the Metropolitan Water Plan.	SC	
3.2.6	Sydney Water must develop and enter into a data sharing agreement with DPE by the Commencement Date (or another date approved by the Minister in writing) to assist in the development and review of the Metropolitan Water Plan (the Data Sharing Agreement)	Internal IPART check	Checked with DPIE – compliant.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
3.2.7	In addition to any other matters agreed by Sydney Water and DPE, the Data Sharing Agreement must:	Internal IPART check	Checked with DPIE – compliant.
	 a) set out the roles and responsibilities of Sydney Water and DPE under the Data Sharing Agreement; 		
	 b) set out the types of data that are covered by the Data Sharing Agreement; 		
	 c) set out the purposes for the sharing of data and information; 		
	 d) set out the requirements that shared data and information must meet; 		
	 e) identify agreed timelines and the format for sharing data and information; and 		
	f) identify procedures for resolving matters of conflict in providing data and information.		
3.2.8	Once Sydney Water has entered into the Data Sharing Agreement it must comply with the Data Sharing Agreement.	Internal IPART check	Checked with DPIE – compliant.
3.2.9	Sydney Water must provide any data or information requested by the Minister in writing:	NR	
	a) by the date specified by the Minister; and		
	 b) to the Minister or, if the Minister so directs, to DPE. 		
3.3	Priority Sewerage Program		
3.3.1	Sydney Water must participate cooperatively in any NSW Government review of the Priority Sewerage Program.	SC	
3.3.2	If required by the Minister, Sydney Water must implement and comply with any outcomes (including timeframes) of any NSW Government review of the Priority Sewerage Program.	SC	
	[Note: The areas to which the Priority Sewerage Program applies are Austral, Menangle, Menangle Park, Nattai, Scotland Island and Yanderra as listed in Schedule B of this Licence.]		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
4.1	Drinking Water		
4.1.1	Sydney Water must maintain a Management System that is consistent with the Australian Drinking Water Guidelines and any requirements relating to Drinking Water specified by NSW Health (the Drinking Water Quality Management System)	Audit	In 2019, we audited a similar clause to this one from the previous licence. We assigned a Compliant Minor Shortcomings grade in the audit. We intend to only audit Sydney Water's management system against certain elements of the Australian Drinking Water Guidelines each year. This year, we propose to audit against elements 2, 3, 4, 5, 6, 7, 10, 11 and 12. This includes the elements that we consider high-risk that we intend to audit every year. It also includes lower-risk clauses that we will audit periodically through the licence period. The auditor will check close out of shortcomings found in the WQMS against some of these elements in previous audits. We propose to not audit elements 1, 8, and 9 this year. We will audit these in future years (noting that this is the first year of this licence period).
			NSW health requests that the
			 that the new risk assessment matrix appropriately reflects the public health risk posed by Sydney Water's operations.
			2. whether the work to align risk methodologies with the Build Own Operate (BOO) partners is still applicable with Sydney Water's new matrix, including how improvements can be prioritised across all systems for action.
			Auditor should check the following recommendation relevant to this clause for completion (see Table 3): - 2019-01

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
4.1.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.1.1 and the Australian Drinking Water Guidelines, the requirements specified by NSW Health prevail.	NR	Information clause
4.1.3	Sydney Water must ensure that the Drinking Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Drinking Water Quality Management System and to the satisfaction of NSW Health. [Note: Sydney Water is to apply the Drinking Water Quality Management System to the Drinking Water system under its control, having regard to the entire Drinking Water supply system – from the water catchment to the Consumer.]	Audit	 In 2019, we audited a similar clause to this one from the previous licence. We assigned a Compliant Minor Shortcomings grade in the audit. We intend to only audit implementation of Sydney Water's management system against elements 2, 3, 4, 5, 6, 7, 10, 11 and 12 of the ADWG. We propose to not audit elements 1, 8, and 9 this year. We will audit these in future years (noting that this is the first year of this licence period). NSW Health requests the audit checks: the progress of work to improve water quality management at the Nepean water filtration plant. potential risks related to backflow and cross connection of drinking water services. Auditor should check the following recommendations relevant to this clause for completion (see Table 3): 2019-02 2019-03

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
4.2	Recycled Water		
4.2	Recycled Water Sydney Water must maintain a Management System that is consistent with the Australian Guidelines for Water Recycling and any requirements relating to water recycling specified by NSW Health (the Recycled Water Quality Management System).	Audit	 In 2019, we audited a similar clause to this one from the previous licence. We assigned a Compliant Minor Shortcomings grade in the audit. We intend to only audit Sydney Water's management system against elements 2, 3, 4, 5, 6, 7, 10, 11 and 12 of the Australian Guidelines for Water Recycling. We propose to not audit elements 1, 8, and 9 this year. We will audit these in future years (noting that this is the first year of this licence period). NSW health requests that the audit checks: that the new risk assessment matrix appropriately reflects the public health risk posed by Sydney Water's operations. whether the work to align risk methodologies with the Build Own Operate (BOO) partners is still applicable with Sydney Water's new matrix, including how improvements can be prioritised across all systems for action. Auditor should check the following recommendation relevant to this
			- 2019-04.
4.2.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.2.1 and the Australian Guidelines for Water Recycling, the requirements specified by NSW Health prevail.	NR	Information clause

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
4.2.3	Sydney Water must ensure that the Recycled Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Recycled Water Quality Management System and to the satisfaction of NSW Health.	Audit	We intend to only audit implementation of Sydney Water's management system against elements 2, 3, 4, 5, 6, 7, 10, 11 and 12 of the AGWR. We propose to not audit elements 1, 8, and 9 this year. We will audit these in future years (noting that this is the first year of this licence period). NSW Health requests that the audit consider potential risks related to backflow and cross connection of recycled water and drinking water services.
4.3	Fluoridation Code		
4.3.1	Sydney Water must comply with the Fluoridation Code and any requirements for fluoridation specified by NSW Health.	SC	
4.3.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.3.1 and the Fluoridation Code, the requirements specified by NSW Health prevail.	NR	Information clause
5.1	Water Continuity Standard		
5.1.1	Sydney Water must ensure that, in each financial year, at least 9,800 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service unaffected by an Unplanned Water Interruption (the Water Continuity Standard).	Audit	In 2019, we audited a similar clause to this one from the previous licence. We assigned a Non- Compliant (Non-Material) grade in the audit. Auditor should check the following recommendation relevant to this clause for completion (see Table 3): - 2019-05.
5.1.2	Sydney Water must use:	Audit	
	a) the Water Continuity Optimal Level; and		
	b) the Water Continuity Tolerance Band,		
	as inputs to decisions regarding the design, construction, operation and maintenance of its water supply system.		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
5.1.3	 For the purposes of clause 5.1.2: a) the Water Continuity Optimal Level is 9,840 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) in each financial year receiving a Drinking Water supply service unaffected by an Unplanned Water Interruption; and b) the Water Continuity Tolerance Band is the band of deviations from the Water Continuity Optimal Level between: the mandatory Water Continuity Standard (specified in clause 5.1.1 above); and ii. an upper bound of 9,880 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) in each financial year receiving a Drinking Water supply service unaffected by an Unplanned Water Interruption. 	NR	Information clause
	use the Water Continuity Optimum Level and Water Continuity Tolerance Band as inputs into certain decisions. If Sydney Water complies with clause 5.1.2, it will be compliant with this clause 5.1 even if the number of Properties unaffected by an Unplanned Water Interruption exceeds the upper bound of the Water Continuity Tolerance Band. However, IPART may consider the prudency and efficiency of any expenditure related to this level of performance at the next review of Sydney Water's prices.]		
5.1.4	Sydney Water must use the best available data (taking account of water pressure data, where available) to determine whether a Property has experienced an Unplanned Water Interruption.	SC	
5.1.5	If a Property experiences an Unplanned Water Interruption that was caused by a Third Party or a power failure, the Property is taken not to have experienced an Unplanned Water Interruption for the purposes of this clause 5.	NR	Information clause

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
5.1.6	For the purpose of the Water Continuity Standard, Water Continuity Optimal Level and Water Continuity Tolerance Band:	NR	Information clause
	 a) each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property; and 		
	[Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as five separate Properties. However, a block of five flats that only receives one Bill from Sydney Water is to be counted as a single Property.]		
	 b) each separate instance, in a financial year, of a single Property experiencing an Unplanned Water Interruption is to be counted as a separate Property that has experienced an Unplanned Water Interruption. 		
5.2	Water Pressure Standard		
5.2.1	Sydney Water must ensure that, in each financial year, at least 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service affected by fewer than 12 Water Pressure Failures (the Water Pressure Standard).	Audit	
5.2.2	A Property is taken to have experienced a Water Pressure Failure when:	NR	Information clause
	 a) a person notifies Sydney Water that the Property has experienced a Water Pressure Failure and Sydney Water confirms that the Property has experienced a Water Pressure Failure; or 		
	 b) Sydney Water identifies that the Property has experienced a Water Pressure Failure (including through its data collection systems and hydraulic analysis). 		
5.2.3	A Property will not be taken to have experienced a Water Pressure Failure if that Water Pressure Failure occurred only because of:	NR	Information clause
	 a) water usage in the case of a fire or other abnormal demand; or 		
	 b) a short term or temporary operational problem (such as a main break), including where caused by a Third Party, that is remedied within four days of its commencement. 		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
5.2.4	For the purpose of the Water Pressure Standard:	NR	Information clause
	 a) where a Property experiences multiple Water Pressure Failures in a day, only one of those Water Pressure Failures is to count as a Water Pressure Failure experienced by that Property; 		
	 b) where a Property experiences a Water Pressure Failure that affects more than one day, each day affected is to be counted as a separate Water Pressure Failure; 		
	 c) each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property; 		
	[Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as five separate Properties. However a block of five flats that only receives one Bill from Sydney Water is to be counted as a single Property.]		
	 d) each Property that is affected by 12 or more Water Pressure Failures in a financial year is to be counted once only as a Property that has been affected by 12 or more Water Pressure Failures in that financial year; and 		
	e) after 30 June 2020, where a Property in, or in the vicinity of, a Property Cluster, is connected for the first time to Sydney Water's Drinking Water supply system and Sydney Water has informed the owner (at the time of connection) of:		
	 the risk of recurring Water Pressure Failures should the Property be connected to that system; and 		
	ii. options to reduce that risk;		
	that Property is not to be counted for the purposes of the Water Pressure Standard.		

Licence	Operating Licence obligation	2020 audit	Comments for the auditor
clause		requirement	
5.2.5	For each Property Cluster, Sydney Water must:	Audit (part (a) only)	
	 a) by 30 June 2020, review its business processes to ensure that no Property at risk of being affected by recurring Water Pressure Failures from the same cause is connected to Sydney Water's Drinking Water supply system, unless the owner (at the time of connection) is: 		
	i. informed of that risk; and		
	ii. provided with options to reduce that risk; and		
	 b) by 31 October 2022, take steps to minimise or eliminate the risk of recurring Water Pressure Failures from that cause, in a manner that takes into account its Customers' willingness to pay for Drinking Water supply services. 		
5.3	Dry Weather Wastewater Overflow Standard		
5.3.1	Sydney Water must ensure that, in each financial year, at least: a) 9,928 Properties per 10,000 Properties	Audit	
	(in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service unaffected by an Uncontrolled Wastewater Overflow; and		
	 b) 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service affected by fewer than three Uncontrolled Wastewater Overflows, 		
	(the Dry Weather Wastewater Overflow Standard).		
5.3.2	A Property is taken to have experienced an Uncontrolled Wastewater Overflow when:	NR	Information clause
	 a person notifies Sydney Water that a Property has experienced a sewage overflow, where Sydney Water later confirms that the sewage overflow is an Uncontrolled Wastewater Overflow; or 		
	 b) Sydney Water's systems identify that a Property has experienced an Uncontrolled Wastewater Overflow. 		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
5.3.3	For the purpose of the Dry Weather Wastewater Overflow Standard:	NR	Information clause
	 a) each Multiple Occupancy Property is to be counted as a single Property; 		
	[Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as a single Property.]		
	 b) for the purpose of clause 5.3.1(a), each separate instance, in a financial year, of a single Property experiencing an Uncontrolled Wastewater Overflow is to be counted as a separate Property that has experienced, in that financial year, an Uncontrolled Wastewater Overflow; and 		
	c) for the purpose of clause 5.3.1(b), each Property that experiences three or more Uncontrolled Wastewater Overflows in a financial year is to be counted once only as a Property that has experienced three or more Uncontrolled Wastewater Overflows in that financial year.		
5.4	Interpretation of standards		
5.4.1	In the case of any ambiguity in the interpretation or application of the Water Continuity Standard, the Water Pressure Standard, the Dry Weather Wastewater Overflow Standard or clause 5.2.5, IPART's interpretation or assessment of the standard or clause will prevail.	NR	Information clause
5.5	Asset Management		
5.5.1	Sydney Water must maintain a Management System in relation to Sydney Water's Assets that is consistent with the Australian Standard AS ISO 55001:2014 Asset management – Management systems – Requirements (the Asset Management System).	Audit	Sydney Water to submit most recent certification/surveillance audit report for its Asset Management System for review. Auditor to review certification/surveillance audit report as part its assessment of this clause.
5.5.2	Sydney Water must ensure that the Asset Management System is fully implemented and that all relevant activities are carried out in accordance with the Asset Management System.	Audit	Sydney Water to submit most recent certification/surveillance audit report for its Asset Management System for review. Auditor to review certification/surveillance audit report as part its assessment of this clause.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
6.1	Customer contract		
6.1.1	The Customer Contract sets out the rights and obligations of Customers and Sydney Water in relation to the Services provided in accordance with this Licence. The Customer Contract is set out in Schedule C of this Licence.	NR	Information clause
6.1.2	Sydney Water must make a copy of the Customer Contract available to any person, free of charge:	Internal IPART check	This clause is not included in the auditor's scope.
	a) on its website; and		
	 b) upon request made to the Contact Centre. 		
6.2	Providing information to Customers		
6.2.1	Sydney Water must prepare one or more communications that:	SC	
	 a) provide a brief explanation of the Customer Contract; 		
	 b) summarise the key rights and obligations of Customers under the Customer Contract; 		
	 c) refer to the types of account relief available for Customers experiencing financial hardship; 		
	 d) outline the rights of Customers to claim a rebate and the conditions that apply to those rights; 		
	 e) contain information regarding how to contact Sydney Water by telephone, email or post; and 		
	 f) contain information regarding the ability of a Customer to enter into agreements with Sydney Water separate to the Customer Contract for the provision of Services by Sydney Water to the Customer. 		
6.2.2	Sydney Water must update the communication or communications to reflect any variations made to the Customer Contract.	SC	

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
6.2.3	Sydney Water must:	SC	
	 a) provide the communication or communications and any updates, free of charge to: 		
	i. Customers at least annually with their Bills; and		
	any person upon request made to the Contact Centre; and		
	 b) make the communication or communications and any updates publicly available on its website, free of charge, within 60 days of the commencement of the Customer Contract or any communication update. 		
6.2.4	Sydney Water must publish on its website and advertise at least annually in a manner that Sydney Water is satisfied is likely to come to the attention of members of the public, information as to:	SC	
	 a) the types of account relief available for Customers experiencing payment difficulty; and 		
	b) rights of Customers to claim rebates and the conditions that apply to those rights		
6.3	Consumers		
6.3.1	Sydney Water's obligations under the following clauses of the Customer Contract are extended to Consumers as though the Consumers were parties to the Customer Contract:	SC	
	 a) clause 5.1 (Payment difficulties and assistance options for all customers); 		
	 b) clause 6.5 (Occupiers (tenants) may pay charges to avoid restriction or disconnection); 		
	 c) clause 12 (If I am unhappy with the service provided by Sydney Water what can I do?); 		
	 d) clause 13 (Consultation, information and privacy); and 		
	 e) clause 14 (When does this contract with Sydney Water terminate?). 		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
6.4	Assistance Options for Payment Difficulties and	Actions for Non-I	Payment
6.4.1	Sydney Water must maintain and fully implement:	Audit	
	 a payment difficulty policy that assists residential Customers experiencing payment difficulty to better manage their current and future Bills; 		
	 b) procedures relating to a payment plan for residential Customers who are responsible for paying their Bills and who are, in Sydney Water's reasonable opinion, experiencing payment difficulty; 		
	 c) procedures for identifying the circumstances under which Sydney Water may disconnect or restrict the supply of water to a Customer's Property; and 		
	 d) provisions for self-identification, identification by community welfare organisations and identification by Sydney Water of residential Customers experiencing payment difficulty, 		
	(the Assistance Options for Payment Difficulties and Actions for Non-Payment).		
6.4.2	Sydney Water must provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non- Payment on its website and to:	Audit	
	 all residential Customers, at least annually with their Bills; 		
	 b) residential Customers who Sydney Water identifies as experiencing payment difficulty on the date that Sydney Water first identifies that the Customer is experiencing payment difficulty; and 		
	any other person upon request made to the Contact Centre.		
6.5	Family Violence		
6.5.1	Sydney Water must develop and implement a family violence policy by 1 July 2020 (or another date approved by IPART in writing).	Audit	IPART did not approve another date.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
6.5.2	The family violence policy must, at a minimum, provide for:	Audit	
	 a) the protection of private and confidential information; 		
	b) access to payment difficulty programs;		
	 c) processes that minimise the reliance on individuals to disclose their family violence; and 		
	 d) processes for referrals to specialist services. 		
6.6	Customer engagement		
6.6.1	Sydney Water must undertake customer engagement to understand its customers' preferences and willingness to pay for service levels. The customer engagement must be relevant, representative, proportionate, objective, clearly communicated and accurate.	SC	
6.6.2	Sydney Water must establish and regularly consult with its Customer Council.	SC	
6.6.3	Sydney Water must provide the Customer Council with information in Sydney Water's possession or under its custody or control necessary to enable the Customer Council to discharge the tasks assigned to it, other than information or documents that are confidential or privileged.	SC	
6.6.4	Sydney Water must keep minutes of proceedings of the Customer Council and make a copy of the minutes available to any person, free of charge, upon request made to the Contact Centre.	SC	
6.6.5	Sydney Water must undertake a review of the operation of the Customer Council. The review must include an assessment of the Customer Council's role, objectives, outcomes and membership, including whether the Customer Council could be used to better support customer engagement, as required by clause 6.6.1.	SC	
6.6.6	Sydney Water must report to IPART on the completed review and its outcomes by 30 June 2020 (or another date approved by IPART in writing).	Internal IPART check	This clause is not included in the auditor's scope.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
6.7	Internal complaints handling		
6.7.1	Sydney Water must maintain a procedure for receiving, responding to and resolving Complaints. The procedure must be consistent with Australian Standard AS/NZS 10002:2014 – Guidelines for complaint management in organizations (the Internal Complaints Handling Procedure).	SC	
6.7.2	Sydney Water must ensure that the Internal Complaints Handling Procedure is fully implemented and that all relevant activities are carried out in accordance with the Internal Complaints Handling Procedure	SC	
6.7.3	Sydney Water must provide to Customers, at least annually with their Bills, information concerning internal Complaints handling. The information must explain how to make a Complaint and how Sydney Water will receive, respond to and resolve Complaints.	SC	
6.7.4	Sydney Water must make the information concerning internal Complaints handling referred to in clause 6.7.3 available to any person, free of charge:	Internal IPART check	This clause is not included in the auditor's scope.
	a) on its website; and		
	 b) upon request made to the Contact Centre. 		
6.8	External dispute resolution scheme		
6.8.1	Sydney Water must be a member of the Energy & Water Ombudsman NSW to facilitate the resolution of disputes between Sydney Water and its Customers and Consumers.	Internal IPART check	This clause is not included in the auditor's scope.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
6.8.2	Sydney Water must:	SC	
	a) prepare a communication that:		
	 lists the dispute resolution services provided by the Energy & Water Ombudsman NSW, including any right to have a Complaint or dispute referred to the Energy & Water Ombudsman NSW; and 		
	ii. explains how a Consumer can contact the Energy & Water Ombudsman NSW;		
	 b) provide a copy of that communication, free of charge to Customers at least once a year with their Bills; and 		
	 c) make a copy of that communication available to any person, free of charge: 		
	i. on its website; and		
	ii. upon request made to the Contact Centre.		
7.1	Memoranda of Understanding with WAMC, NSV	V Health and EPA	A
7.1.1	Sydney Water must maintain the memoranda of understanding entered into under section 35 of the Act with:	SC	
	 a) the Water Administration Ministerial Corporation (WAMC); 		
	 b) the Secretary of the Ministry of Health (NSW Health); and 		
	 c) the Environment Protection Authority (EPA). 		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
7.1.2	The purpose of the memoranda of understanding referred to in clause 7.1.1 is to form the basis for cooperative relationships between the parties. In particular:	NR	Information clause
	 a) the purpose of the memorandum of understanding with WAMC is to recognise the role of WAMC in regulating water access, use and management and Sydney Water's right to use water vested in WAMC; 		
	 b) the purpose of the memorandum of understanding with NSW Health is to recognise the role of NSW Health in providing advice to the NSW Government in relation to Drinking Water quality standards and the supply of water which is safe to drink; and 		
	c) the purpose of the memorandum of understanding with EPA is to recognise the role of EPA as the environment regulator of New South Wales and to commit Sydney Water to environmental obligations.		
7.2	Memorandum of Understanding with FRNSW		
7.2.1	Sydney Water must use its best endeavours to maintain a memorandum of understanding with Fire and Rescue NSW (FRNSW).	SC	
7.2.2	Sydney Water must use its best endeavours to comply with the memorandum of understanding with FRNSW.	SC	
7.2.3	The purpose of the memorandum of understanding with FRNSW is to form the basis for cooperative relationships between the parties. In particular, the purpose is to:	NR	Information clause
	 a) develop the roles and responsibilities of the parties as they relate to each other; 		
	b) identify the needs and constraints of the parties as they relate to each other; and		
	 c) identify and develop strategies for efficient and effective provision of firefighting water consistent with the goals of each party. 		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
7.2.4	The memorandum of understanding with FRNSW must require the maintenance of a working group and must provide that:	SC	
	 a) the working group must include representatives from Sydney Water and FRNSW and may include representatives from other organisations such as the NSW Rural Fire Service; and 		
	 b) the working group is to consider the following matters (at a minimum): 		
	 information sharing arrangements between Sydney Water and FRNSW; 		
	 agreed timelines and a format for Sydney Water to provide a report to FRNSW detailing the network performance with regard to availability of water for firefighting (taking into account the minimum available flow and pressure in localised areas of the network); 		
	iii. arrangements for Sydney Water to consult with FRNSW in the design of new assets and planning of system maintenance, where planning indicates that minimum available flow and pressure may unduly impact firefighting in the network section under consideration; and		
	V. other matters as agreed by both Sydney Water and FRNSW		
8.1	Negotiations with WIC Act licensees and Potent	ial Competitors	
8.1.1	Sydney Water must negotiate the provision of Services to WIC Act licensees and Potential Competitors in Good Faith.	Audit	

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
8.2	Publications of servicing information		
8.2.1	Sydney Water must, by the dates specified in this clause 8.2, publish electronically (in a form accessible from its website) at least ten years of servicing information for each major water system and wastewater system. The servicing information for each major water system and wastewater system must, at a minimum, include information on:	NR	Information clause (about the requirements related to the obligations in the remaining sub- clauses).
	a) current and projected demand;		
	 b) current and projected capacity constraints; 		
	 c) indicative costs of alleviating or deferring capacity constraints; 		
	 d) locations where further investigation is needed; and 		
	 e) key sources of information used to develop the servicing information where those sources are publicly available, 		
	(the Servicing Information).		
8.2.2	Sydney Water must, by 30 September 2020 (or another date approved by IPART in writing), publish electronically the Servicing Information for each major water system and wastewater system that it has available by that date that is in a form suitable for publication.	NR	
8.2.3	Sydney Water must continue to publish Servicing Information for each major water system and wastewater system as it becomes available. Sydney Water must publish all Servicing Information by 30 June 2021 (or another date approved by IPART in writing).	NR	
8.2.4	Sydney Water must publish updated Servicing Information for each major water system and wastewater system as soon as practicable after any such updated Servicing Information becomes available in a form suitable for publication.	SC	
8.2.5	Sydney Water must review and update the Servicing Information for each major water system and wastewater system at least once between:	NR	
	 a) The date that is 12 months after the initial publication of the Servicing Information for that major water system or wastewater system under clause 8.2.2; and 		
	 b) 30 June 2023 (or another date approved by IPART in writing). 		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
8.2.6	Sydney Water is not required to comply with clauses 8.2.1 to 8.2.5 in relation to a particular major water system or wastewater system to the extent approved by IPART in writing. Sydney Water may apply to IPART for approval under this clause only where there are critical infrastructure security concerns in relation to a particular major water system or wastewater system.	NR	Information clause
8.3	Code of Conduct		
8.3.1	Sydney Water must use its best endeavours to cooperate with each WIC Act licensee to establish a code of conduct required by a WIC Act licence where Sydney Water has received a written request from the WIC Act licensee to establish such a code.	Audit	
8.3.2	Where the Minister administering the WIC Act has established a code of conduct under clause 25 of the WIC Regulation, Sydney Water will be taken to have satisfied its obligation under clause 8.3.1 by applying the code of conduct to the relevant licensee under the WIC Act.	NR	
9.1	Cyber Security Management System		
9.1.1	From the Commencement Date (or another date approved by IPART in writing), Sydney Water must maintain a Management System for cyber security of Sydney Water's Assets (the Cyber Security Management System) that covers: a) information technology environments, hardware and systems; and	NR	IPART approved change of Commencement Date to 1 July 2020
	 b) operational technology environments, hardware and systems 		
9.1.2	From the Commencement Date (or another date approved by IPART in writing), Sydney Water must ensure that the Cyber Security Management System is fully implemented and that all relevant activities are carried out in accordance with the Cyber Security Management System.	NR	IPART approved change of Commencement Date to 1 July 2020
9.2	Critical infrastructure Compliance manager		
9.2.1	Sydney Water must nominate, by notice in writing to IPART and the Commonwealth Representative, an executive level employee as Critical Infrastructure Compliance Manager.	SC	
	[NOTE: The reference to an executive level employee is a reference to a Level 3 employee or above under Sydney Water's structure at the Commencement Date.]		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
9.2.2	Sydney Water's Critical Infrastructure Compliance Manager must be responsible for compliance with clause 9 of the Licence and Sydney Water's obligations under the <i>Security</i> <i>of Critical Infrastructure Act 2018</i> (Cth), and must act as the contact person for the Commonwealth Representative.	SC	
9.3	National Security Clearances		
9.3.1	From 1 January 2020 (or another date approved by IPART in writing), Sydney Water must ensure that National Security Clearances are held by its Critical Infrastructure Compliance Manager, two board members and the executive level employees responsible for each of the following matters:	NR	IPART approved change of Commencement Date to 1 July 2020
	 a) operational technology security (including cyber security strategy, managing remote access to Assets and delivery of SCADA capability); 		
	 b) network operations security (including operation, maintenance and physical security of Assets); and c) Personnel security operations (including security of Personnel and security risks posed by Personnel). 		
	[Note: The responsibilities at (a) to (c) above may be held by a single employee or shared between multiple employees. To ensure compliance with this clause when employees resign or are on leave, Sydney Water should ensure that National Security Clearances are held by alternates with relevant experience.]		
10.1	Operational Audits		
10.1.1	Sydney Water must cooperate with an audit undertaken by IPART or an Auditor of Sydney Water's compliance with any of the following:	Internal IPART check	This clause is not included in the auditor's scope.
	a) this Licence (including the Customer Contract);		
	b) the Reporting Manual; and		
	any matters specified by the Minister, (the Operational Audit).		
10.1.2	For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must, within a reasonable period of receiving a request from IPART or an Auditor, provide IPART or the Auditor with all the information in Sydney Water's possession, custody or control that is necessary to conduct the Operational Audit, including any information that is reasonably requested by IPART or an Auditor.	Internal IPART check	This clause is not included in the auditor's scope.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
10.1.3	For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must permit IPART or the Auditor to:	Internal IPART check	This clause is not included in the auditor's scope.
	 a) access any works, premises or offices occupied by Sydney Water; 		
	 b) carry out inspections, measurements and tests on, or in relation to, any such works, premises or offices; 		
	 c) take on to any such premises or offices any person or equipment necessary for the purpose of performing the Operational Audit or verifying any report on the Operational Audit; 		
	 d) inspect and make copies of, and take extracts from, any books and records of Sydney Water that are maintained in relation to the performance of Sydney Water's obligations under this Licence (including the Reporting Manual); and 		
	e) discuss matters relevant to the Operational Audit or any report on the Operational Audit with Sydney Water, including Sydney Water's officers and employees.		
10.2	Reporting		
10.2.1	IPART has the function of determining Sydney Water's reporting and auditing obligations and publishing these obligations in a reporting manual (the Reporting Manual).	NR	
10.2.2	Sydney Water must comply with all of its reporting and auditing obligations set out in the Reporting Manual, including in relation to:	Audit	(d) Audited internally by IPART and not included in the auditor's scope.(f) To be audited separately by
	a) water conservation and planning;		IPART and not included in the
	 b) performance standards for water quality; 10 Performance Monitoring and Reporting 26 Operating Licence 2019- 2023 		auditor's scope.
	 c) performance standards for service interruptions; 		
	d) Customers and Consumers;		
	e) information and services for competitors;		
	f) critical infrastructure security; and		
	g) performance monitoring and reporting.		

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
10.2.3	 Sydney Water must: a) compile indicators of the direct impact on the environment of Sydney Water's activities (the Environment Performance Indicators). The Environment Performance Indicators must be consistent with the performance indicators specified in the Reporting Manual with an indicator number starting with 'E'; b) monitor and compile data on the Environment Performance Indicators, including data that allows a year to year comparison of the Environment Performance Indicators; and c) report on the Environment Performance 	SC	In 2019, we audited a similar clause to this one from the previous licence. We assigned a Compliant Minor Shortcomings grade in the audit. Auditor should check the following recommendation relevant to this clause for completion (see Table 2): - 2019-06.
10.2.4	Reporting Manual. Sydney Water must maintain sufficient record	Audit	
	systems to enable Sydney Water to report accurately in accordance with this clause 10.2.		
10.2.5	In the case of any disagreement between IPART and Sydney Water regarding the interpretation or application of any requirements of the Reporting Manual, IPART's interpretation or assessment of the application of the requirements will prevail.	NR	
10.3	Provision of information for performance monitor	ring	
10.3.1	Sydney Water must provide IPART information relating to the performance of any of Sydney Water's obligations under clause 10.2 (including providing IPART physical and electronic access to the records required to be kept under clause 10.2) within a reasonable time of Sydney Water's receiving a request from IPART for that information.	Internal IPART check	This clause is not included in the auditor's scope.
10.3.2	Sydney Water must provide IPART such information as is reasonably required to enable IPART to conduct any review or investigation of Sydney Water's obligations under this Licence within a reasonable time of Sydney Water receiving a request from IPART for that information.	Internal IPART check	This clause is not included in the auditor's scope.
10.3.3	If Sydney Water engages any person (including a subsidiary) to undertake any activities on its behalf, it must take all reasonable steps to ensure that, if required by IPART or an Auditor, any such persons provide information and do the things specified in clause 10.1 as if that person were Sydney Water.	Internal IPART check	This clause is not included in the auditor's scope.

Licence clause	Operating Licence obligation	2020 audit requirement	Comments for the auditor
10.3.4	If IPART or an Auditor requests information that is confidential, the information must be provided to IPART or the Auditor, subject to IPART or the Auditor entering into reasonable arrangements to ensure that the information remains confidential.	Internal IPART check	This clause is not included in the auditor's scope.
10.3.5	Sydney Water must provide NSW Health with information relating to water quality in the manner and form specified by NSW Health within a reasonable time of receiving NSW Health's request.	Internal IPART check	This clause is not included in the auditor's scope.
	[Note: Under section 19 of the Public Health Act 2010 (NSW), the Secretary of NSW Health may require Sydney Water to produce certain information.]		

Source: Sydney Water Corporation five year audit program.

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2019 audit findings, and status as reported by Sydney Water in audit recommendations update on 31 March 2020	Guidance for 2020 audit
2019-01	Water Quality (Drinking water) clause 2.1.1	By 30 June 2020, establish a documented procedure for evaluating the chlorine solution used in the networks maintenance activities and for evaluating the associated supplier(s).	New recommendation in 2019. Status reported on 31 March 2020: On track Work is underway to obtain chlorine solution used in networks maintenance activities through Sydney Water's centrally managed bulk chemical supply agreements. Once finalised, this process will be documented in the procurement procedure for chemical supply.	Auditor to check for completion.
2019-02	Water Quality (Drinking water) clause 2.1.2	By 30 June 2020, ensure calibration records associated with the work instruction, HACH 2100P Series Portable Turbidimeter – Calibration and Maintenance, are appropriately maintained to demonstrate that the required calibrations are undertaken at the specified frequency as per the work instruction.	New recommendation in 2019. Status reported on 31 March 2020: Completed Current practice is to conduct a monthly calibration check on the instrument. Document <i>D0001552 – HACH 2100</i> <i>Series Portable Turbidimeter – Calibration and</i> <i>Maintenance</i> has been updated and approved in the document control system to reflect current work practices and recordkeeping requirements. The calibration records will be available to be reviewed for the next audit.	Auditor to check for completion.
2019-03	Water Quality (Drinking water) clause 2.1.2	By 30 June 2020, ensure internal key performance indicator reporting outlined in the Drinking Water Product Specifications (IMS0152.01) is undertaken as required. The following actions are to be implemented:	New recommendation in 2019. Status reported on 31 March 2020: On track Sydney Water is currently defining the scope of the audit for cross-connection risk in relation to the role of plumbing inspectors (Office of Fair Trading).	Auditor to check for completion.

Table 3 Recommendations / outstanding items from previous audits

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2019 audit findings, and status as reported by Sydney Water in audit recommendations update on 31 March 2020	Guidance for 2020 audit
		 A review of the target criteria for cross-connection management in the Drinking Water Product Specifications (IMS0152.01) is to be undertaken to ensure that new and established residential property cross-connection rates are at a level that prevents unacceptable exposure (nominally 1/1000 houses). Appropriate monitoring of the targets must be established. The review must be undertaken in consultation with NSW Health. 	This matter will be discussed at the upcoming Joint Operational Group (JOG) meeting with NSW Health.	
2019-04	Water Quality (Recycled water) Clause 2.2.1	 By 31 March 2020, ensure the recycled water risk assessments are more detailed to manage risk effectively. The following actions are to be undertaken: All possible modes of failure are to be assessed through the identification of hazards and hazardous events, although these may be grouped. Specific actions or procedures are identified as preventive measures to ensure the measure is understood, communicated and auditable. Significant risks should be clearly identified, to ensure in place and prioritised accordingly. 	New recommendation in 2019. Status reported on 31 March 2020: Completed Sydney Water's Enterprise Risk Management Framework outlines our approach to identify, analyse, evaluate and treat risks in accordance with the ISO 31000 standard. The framework provides standardised tools, templates and procedures to support risk management across the organisation. In addition, Sydney Water has developed a Recycled Water Hazard and Risk Library to ensure that recycled water risk assessments are sufficiently detailed and all possible modes of failure are considered. An uncertainty matrix is also being used in these risk assessments. The above tools will be utilised in the next risk assessments for the Wollongong Stage 1 and 2 recycled water schemes.	Auditor to check for completion.

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2019 audit findings, and status as reported by Sydney Water in audit recommendations update on 31 March 2020	Guidance for 2020 audit
		 Areas of uncertainty are to be identified to ensure that there is continual improvement in the risk assessment process. These are to be implemented for the next revision of the Wollongong Stages 1 and 2 risk assessments. 	The Wollongong Stage 1 risk assessment is scheduled for 25 March 2020. Wollongong Stage 2 recycled water schemes have commenced the verification of Log Reduction Value (LRV) monitoring program which will inform the next revision of the risk assessment.	
2019-05	Water Continuity Standard Clause 4.2.2	By 31 March 2020, Sydney Water is to complete a formal debrief (including a root cause analysis) on the Punchbowl water main break to identify and develop more effective monitoring arrangements to enable timely identification of operational conditions that may affect its performance against the Water Continuity Standard.	New recommendation in 2019. Status reported on 31 March 2020: Completed A detailed investigation of the Punchbowl incident, using the Investigation Cause Analysis Method (ICAM), has been completed and a report with identified improvement actions prepared.	Auditor to check for completion.
2019-06	Environmental indicators Clause 6.2.1	By 30 June 2020 Sydney Water is to amend its reporting of indicator E1 and E2 to include electricity consumption and renewable electricity generation by build-own- operate-transfer (BOOT) contractors.	New recommendation in 2019. Status reported on 31 March 2020: Completed Sydney Water's internal reporting manual has been amended to include the electricity consumption and renewable electricity generation data for build-own- operate-transfer (BOOT) contractors in its reporting on environmental performance indicators E1 and E2 from 2019-20. Arrangements are in place to ensure that the required data is available from the BOOT plants.	Auditor to check for completion.

Source: IPART, Report to the Minister - Sydney Water Corporation Operational audit 2018-19, 18 December 2019

Audit year	Location	Facility
2019	Oak Flats	Re-chlorination Plant
	Wollongong	Water Recycling Plant
	Helensburgh	Reservoir
	Woronora	Water Filtration Plant
2018	Cascade	Water Filtration Plant
	Parklea	Drinking and Recycled Water Reservoirs, and rechlorination station
	Rouse Hill	Water Recycling Plant and network
2017	Nepean	Water Filtration Plant
	Prospect	Water Filtration Plant
	Campbelltown	Reservoir
	Liverpool	Water Recycling Plant
	Guildford	Water main renewal - maintenance
2016	Orchard Hill	Water Filtration Plant
	Preston	Maintenance Depot
	Cronulla	Wastewater Treatment Plant
2015	Parklea	Reservoir
	Box Hill	Pumping Station
	North Richmond	Water Filtration Plant
	Rouse Hill	Water Recycling Plant
2014	West Camden	Water Recycling Plant
	Warragamba	Water Filtration Plant
		South West Growth Area
2013	Macarthur	Water Filtration Plant
	Liverpool	Customer Service Centre
	Liverpool	Water Recycling Plant
	West Hoxton	Priority Sewage Project
2012	Wollongong	Water Recycling Plant
	Woronora	Water Filtration Plant
	Heathcote	Reservoir
2011	N/A	Three treated water reservoirs
	Orchard Hills	Water Filtration Plant
	Drummovne	Mains flushing
	····· · ····	

Table 4 Field verification locations for Sydney Water Corporation

D Auditor's report on the operational audit 2020 – Sydney Water



Sydney Water

2020 OPERATIONAL AUDIT

IPART February 2021 Version 5.0

Document Status:	Version: 5.0	For issue		
Document	Status		Version	Date
History:	Internal draft		1.0	2-Nov-20
	First draft report		2.0	20-Nov-20
	Revised draft report		3.0	18-Dec-20
	Revised draft report – inconsistency in compliance grade amended		4.0	21-Dec-20
	Final report		5.0	22-Feb-21
Authors:	Dr Annalisa Contos, Natalie Crawford, Stephen Walker (Cardno)			
Contact:	Annalisa Contos Atom Consulting 65 Cambourne Ave St Ives NSW 2075 annalisa@atomconsulting.com.au 02 9488 7742			
File Name:	IPT2005SWC_Sydney Water final report_v5.0.docx			

Executive Summary

Auditor's declaration

This report presents the findings of the audit of Sydney Water operations against the *Sydney Water Operating Licence 2019-2023* and the *Sydney Water Act 2014* (NSW), consistent with audit requirements set out in IPART's Audit Guideline Public Water Utilities (July 2019) for the period 1 July 2019 to 30 June 2020.

We thank the Sydney Water staff for their conduct and professionalism during the audit, and in the provision of information throughout the audit process. The requirement for the interviews to be conducted remotely due to COVID-19 was well-managed by the Sydney Water Team.

The auditors confirm that:

- We have seen sufficient evidence on which to base our conclusions.
- Our audit findings accurately reflect the professional opinions of the auditors.
- We have conducted the audit, determined audit findings and prepared the report consistent with audit requirements set out in IPART's Audit Guideline Public Water Utilities (July 2019) and IPART's Request for Quote.
- Our audit findings have not been unduly influenced by the utility and/or any of its associates.

Major findings

A summary of major audit findings for the 2019-20 audit period is shown in Table 1.

Section	Clause	Sub clauses	Audit findings
1 Licence Context	1.7 – Pricing	1.7.1	Non-compliant (non-material)
3 Water Conservation	3.1 – Economic approach for	3.1.1	Non-compliant (non-material)
and Planning	water conservation	3.1.2	Non-compliant (material)
		3.1.4	Compliant
	3.2 – Water Planning	3.2.4	Non-compliant (material)
4 Performance	4.1 – Drinking water	4.1.1	Compliant (minor shortcomings)
Standards for Water		4.1.3	Compliant (minor shortcomings)
Quality	4.2 – Recycled water	4.2.1	Compliant (minor shortcomings)
		4.2.3	Compliant (minor shortcomings)
5 Performance	5.1 – Water Continuity	5.1.1	Non-compliant (non-material)
Standards for Service	Standard	5.1.2	Compliant
Interruptions	5.2 – Water Pressure	5.2.1	Compliant
	Standard	5.2.5	Non-compliant (non-material)
	5.3 – Dry Weather Wastewater Overflow Standard	5.3.1	Compliant
	5.5 – Asset Management	5.5.1	Compliant
		5.5.2	Non-compliant (non-material)
6 Customers and	6.4 – Assistance Options for	6.4.1	Compliant
Consumers	Payment Difficulties and Actions for Non-Payment	6.4.2	Compliant
	6.5 – Family Violence	6.5.1	Compliant
		6.5.2	Compliant
8 Information and Services for Competitors	8.1 – Negotiations with WIC Act licensees and Potential Competitors	8.1.1	No Requirement
	8.3 – Code of conduct	8.3.1	No Requirement
10 Performance	10.2 – Reporting	10.2.2	Non-compliant (non-material)
Monitoring and Reporting		10.2.4	Compliant (minor shortcomings)

Table 1. Summary of audit findings against audited licence obligations

Recommendations

Recommendations arising from the Sydney Water 2020 Operational Audit are shown in Table 2 and a summary of the risks of non-compliance.

 Table 2. Operational audit 2019-20 recommendations and risks of non compliance

Section	Sub clauses	Risk of non compliance	Recommendations
1 Licence Context	1.7.1	Failure to cease charging of the SDP uplift meant that customers may have been overcharged. However, there was no	Recommendation 1.7.1-1: By 28 February 2021 (in advance of the updating of charges for the next financial year), Sydney Water must review its operating procedures to ensure that they reflect the requirements relating to any uplift charges for
Section	Sub clauses	Risk of non compliance Recommendations	
--	---	--	--
		net financial impact as Sydney Water could have recovered these costs through other means.	the Sydney Desalination Plant (noting that the 1 July 2020 Determination has different mechanisms for the uplift charge) and update these procedures as required. Sydney Water should also conduct awareness raising around uplift charging requirements for relevant staff, where appropriate.
3 Water Conservatio n and Planning	3.1.1 If the water conservation program is not consistent with the Current Economic Method there is a risk that investment in conservation does not represent good value for money and that the program is not effectively implemented. 3.1.1 If the water conservation Recommendation 3.1.1-1: Sydney V update the Water Conservation Rep more information on the developm and monitoring of the program. Th more information on how projects identified from the wide range of p assessment of project effectiveness of benefits. The structure of this rep to be included should be developed populated for the next water conservation for the 2020/21 year.		Recommendation 3.1.1-1: Sydney Water must update the Water Conservation Report to include more information on the development, delivery and monitoring of the program. This should include more information on how projects are first identified from the wide range of potential options, assessment of project effectiveness and monitoring of benefits. The structure of this report and content to be included should be developed and then populated for the next water conservation report for the 2020/21 year.
			Recommendation 3.1.1-2: By 30 June 2021, Sydney Water must demonstrate measures that have been taken in the 2020/21 financial year to improve its systems and processes used to deliver the water conservation program, including program monitoring and corrective action processes.
	3.1.2	If the water conservation program is not implemented, then investment is inefficient and future supply augmentation options may be brought forward.	Recommendation 3.1.2-1: Sydney Water must identify, assess, and include where appropriate measures for reducing leakage to below the economic level within its water conservation program. This should be completed for inclusion in the 2021/22 water conservation program.
	3.2.4	If Sydney Water does not undertake water planning required of it, water security planning may be less efficient and effective than otherwise.	Refer to Recommendation 3.1.2-1 under Clause 3.1.2.
4 Performance Standards for Water Quality	4.1.1	Inconsistencies in the risk matrix across categories may result in water quality risks not being managed with appropriate urgency compared with other organisational risks. Out of date contact information can limit communication during an incident or emergency	Recommendation 4.1.1-1: By 31 March 2021, document the scope of the drinking water annual operational risk assessment reviews, to ensure that the assessment of public health risks does not occur without a NSW Health representative present. Recommendation 4.1.1-2: By 30 June 2021, review the Corporate Risk Matrix to rectify inconsistencies between Public Health and Injury /Illness consequence descriptors, including liaison with NSW Health.
		incluent of emergency.	Recommendation 4.1.1-3: By 31 March 2021, formalise the process for how the updated risk matrix and risk procedure is being implemented across water supply systems, including resolving

Section	Sub cla <u>uses</u>	Risk of non compliance	Recommendations
			inconsistencies in superseded documentation references, particularly noting the IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water procedure.
	4.1.3	If risk management actions are not progressed, the risk posed to public health from non-compliance could be significant.	Recommendation 4.1.3-1: By 30 June 2021, establish processes for identifying and actioning improvement items identified in risk assessments to ensure timely resolution and update the Product Management Improvement Framework. Recommendation 4.1.1-1 also applies to this clause.
	4.2.1	Without an appropriately maintained Recycled Water Quality Management System, the risk posed to public health from non- compliance could be significant.	Recommendation 4.2.1-1: By 30 June 2021, document the procedure for undertaking the recycled annual operational risk assessment reviews.
			Recommendation 4.2.1-2: By 31 March 2021, ensure risk assessment documentation (including workshop reports and the operational risk assessment procedure) refer to the current Risk Management Procedure and Risk Matrix.
			Recommendation 4.2.1-3: By 30 September 2021, update critical control point documentation for Camden West WRP to document the basis for the CCT low flow critical control point
			Recommendation 4.2.1-4: By 31 December 2021, update scheme specific recycled water quality management plans that are scheduled for review in this period to include reference to scheme specific documentation, including West Camden Recycled Water Quality Management Plan. Include an action in the Recycled Water Improvement Register to update all scheme specific plans with this information at their scheduled review.
			Recommendation 4.2.1-5: By 31 December 2021, update the recycled water audit schedule to ensure a yearly review of high risk AGWR elements at a number of recycled water schemes each year (as agreed with NSW Health). The schedule should be risk-based and consider locations and exposures. All recycled water schemes should be audited within a 3-year cycle.
			Recommendation 4.2.1-6: By 30 June 2021, review and update the Product Management Improvement Framework to explicitly reference recycled water. Establish processes for identifying and actioning action items in risk assessment to ensure timely resolution and update the Product Management Improvement Framework.
	4.2.3	Without an appropriately implemented Recycled Water Quality Management System the	Recommendation 4.2.3-1: By 30 June 2021, Sydney Water must review permissions and limits in SCADA to ensure that changes outside critical limits can only be made in accordance with an appropriate

Section	Sub clauses	Risk of non compliance	Recommendations
		risk posed to public health from non- compliance could be significant.	change management procedure and that critical limits align with the critical control point documentation for all plants. Recommendation 4.2.3-2: By 30 June 2021, formalise the review of recycled water verification report, to be explicit about the need to manually check that exceptions are included in the Irrigation Scheme Monthly reports, and train staff in the updates.
5 Performance Standards for Service Interruptions	5.1.1	If more properties experience unplanned water interruptions than the standard, customers will have not received the level of service they have paid for and there may be public health impacts.	Recommendation 5.1.1-1: By 30 June 2021, Sydney Water must provide updated analysis of its understanding of the relationship between prevailing weather conditions in the last five years, soil moisture and the impact on water main bursts, leaks and unplanned supply interruptions. Recommendation 5.1.1-2: By 31 December 2021, Sydney Water must complete lessons learned reports for the five largest unplanned water supply interruption events that occurred in 2019/20 and identify what measures could be implemented in future to reduce the number of properties impacted by future interruptions at these locations. Sydney Water should demonstrate how it has considered the application of these lessons learned across its entire network.
	5.2.5	If the business processes are not updated, customers may unknowingly purchase a property at risk of recurring Water Pressure Failures and therefore not receive the level of service they may expect	Recommendation 5.2.5-1: By 31 March 2021, Sydney Water must update its business process manual to fully and accurately reflect low pressure clusters
	5.5.2	Assets are poorly managed leading to higher costs and failure to meet required service levels including public health and environmental protection. The risk identified through audit was the monitoring of the condition of sewage pump stations. The risk of not knowing pump station condition is that these assets may fail unexpectedly leading to environmental harm, public health risks and service interruption.	 Recommendation 5.5.2-1: By 31 December 2021, Sydney Water must review its inspection programs for all asset classes to incorporate lessons learned from its current inspection program for sewage pumping stations. The output should be an updated condition assessment strategy (or similar) document(s) that specifies the desired approach to condition assessment for all major asset classes including (for example): Consideration of risk of asset failure and consequence of failure Frequency of inspection Level of inspection (visual v detailed inspection) and situations where more detailed inspections are warranted Inspection techniques

Section	Sub cla <u>uses</u>	Risk of non compliance	Recommendations	
			 Resourcing and support considerations such as access and shutdowns 	
10 Performance Monitoring and Reporting	10.2.2	Without accurate and timely information, there is a risk that the performance of Sydney Water against its Operating Licence requirements will not be known.	Recommendation 10.2.2-1: By 31 March 2021, Sydney Water must ensure that all information required for annual compliance reporting is included with particular regards to; critical control breach for all plants, whether automated or manually monitored, assessment of the performance of critical control points over the long term; the proposed water quality management activities and programs, including expected outcomes, scope and timetable for completion. Recommendation 10.2.2-2: Sydney Water must provide detailed and quantitative discussion regarding the drivers for observed performance and variances to historical performance for all Performance Standards within the Performance Standards Report. This should be implemented for the next Performance Standards Report which will be for the 2020/21 year. Under Sydney Water's Reporting Manual, the Performance Standards Report is due for submission by 1 September following the end of the relevant financial year (i.e., 1 September 2021).	
	10.2.4	Without accurate and timely information, there is a risk that the performance of Sydney Water against its Operating Licence requirements will not be known.	Recommendation 10.2.4-1: By 30 June 2021, Sydney Water should improve document control of the records held in its systems by ensuring that information such as the version date, version number, change history and document author are included in all records.	

Contents

1 Introd		duction	1
	1.1	Objectives	1
	1.2	Audit method	1
		Audit scope	1
		Audit standard	2
		Audit steps	2
		Audit team	2
		Audit grades	4
	1.3	Regulatory regime	4
	1.4	Quality assurance process	5
2	Deta	iled audit findings	6
	2.1	Site visit report	6
	2.2	Detailed audit findings by clause	10
		Clause 1.7 – Pricing	10
		Clause 3.1 – Economic approach for water conservation	14
		Clause 3.2 – Water Planning	23
		Clause 4.1 – Drinking water	25
		Clause 4.2 – Recycled Water	50
		Clause 5.1 – Water Continuity Standard	74
		Clause 5.2 – Water Pressure Standard	80
		Clause 5.3 – Dry Weather Wastewater Overflow Standard	84
		Clause 5.5 – Asset Management	87
		Clause 6.4 – Assistance Options for Payment Difficulties and Acti for Non-Payment	ons 96
		Clause 6.5 – Family Violence	100
		Clause 8.1 – Negotiations with WIC Act licensees and Potential Competitors	103
		Clause 8.3 – Code of Conduct	104
		Clause 10.2 – Reporting	105
		Previous Recommendations	116

Tables

Table 1. Summary of audit findings against audited licence obligations	iv
Table 2. Operational audit 2019-20 recommendations and risks of non complia	nce iv
Table 3. Licence sections within the 2019-20 audit scope	1
Table 4. Audit team members and their qualifications	3
Table 5. Audit grades	4
Table 6. Key legal and formal instruments relevant to Sydney Water operating licence	4
Table 7. Clause 1.7.1 compliance grade	10
Table 8. Clause 3.1.1 compliance grade	14
Table 9. Clause 3.1.2 compliance grade	18
Table 10. Clause 3.1.4 compliance grade	22
Table 11. Clause 3.2.4 compliance grade	23
Table 12. Clause 4.1.1 compliance grade	25
Table 13. Clause 4.1.3 compliance grade	37
Table 14. Clause 4.2.1 compliance grade	50
Table 15. Clause 4.2.3 compliance grade	63
Table 16. Clause 5.1.1 compliance grade	74
Table 17. Five largest unplanned water supply interruption events in 2019/20	76
Table 18. Clause 5.1.2 compliance grade	77
Table 19. Example documents where water continuity standards are used for d making	ecision 78
Table 20. Clause 5.2.1 compliance grade	80
Table 21. Clause 5.2.5 compliance grade	82
Table 22. Mapping of low-pressure areas between Performance Standard repor Watermain connection manual	rt and 83
Table 23. Clause 5.3.1 compliance grade	84
Table 24. Clause 5.5.1 compliance grade	87
Table 25. Clause 5.5.2 compliance grade	90
Table 26. Action items identified from Phase 1 Level 2 SPS inspections	94
Table 27. Clause 6.4.1 compliance grade	96
Table 28. Clause 6.4.2 compliance grade	98
Table 29. Clause 6.5.1 compliance grade	100

Table 30. Clause 6.5.2 compliance grade	101
Table 31. Clause 8.1.1 compliance grade	103
Table 32. Clause 8.3.1 compliance grade	104
Table 33. Clause 10.2.2 compliance grade	105
Table 34. Summary of compliance with reporting obligations	109
Table 35. Clause 10.2.4 compliance grade	113

Figures

Figure 1.	Comparison of actual leakage performance with the Economic Level of	
L	_eakage2	0

J	
ltem	Detail
ADWG	NHMRC, NRMMC (2011) Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra. ISBN Online: 1864965118
AGWR	EPHC, NRMMC (2006) <i>Australian Guidelines for Water Recycling:</i> <i>Managing Health and Environmental Risks (Phase 1)</i> , Natural Resource Management Ministerial Council, Environment Protection and Heritage Council and Australian Health Ministers Conference. ISBN Online 1 921173 06 8
AMCV	Asset Management Customer Value
AMS	Asset Management System
AS	Australian Standard
ASAE 3100	Standard on Assurance Engagements ASAE 3100 Compliance Engagements
AS ISO 19600:2015	Compliance management systems – Guidelines
AS/NZS ISO 19011:2019	Guidelines for auditing management systems
AS/NZ ISO 9001:2016	Quality management systems – Requirements
AS/NZS 4020:2018	Australian and New Zealand Standards for testing of products for use in contact with drinking water
AS 4747:2013	Australian Standard, Meters for non-urban water supply – In- service compliance for non-urban water meters
Audit Guideline	IPART Public Water Utility Audit Guideline (July 2019)
Audit Period	The dates of 1 July 2019 to 30 June 2020 over which Sydney Water compliance is checked against certain clauses of its Operating Licence (as determined by IPART)
BOO	Build Own Operate
BMIS	Business management information system
C2C	Catchment to customer
CBAV	Condition based asset valuation
ССР	Critical control point
ССТ	Chlorine contact tank
cfu	Colony forming unit
CRM	Customer records management

Glossary

Item	Detail
Component	Either refers to the Element components of the ADWG Framework for the Management of Drinking Water Quality, AGWR Framework for the Management of Recycled Water Quality and Use or Sydney Water WQMS component depending upon the context
DPIE	NSW Department of Planning, Industry and Environment
DWQMP	Drinking Water Quality Management Plan
ELL	Economic level of leakage
Element	Elements of the ADWG Framework for the Management of Drinking Water Quality or AGWR Framework for the Management of Recycled Water Quality and Use
Framework	Framework for Management of Drinking Water Quality or AGWR Framework for the Management of Recycled Water Quality and Use
FRM	Software used by Sydney Water
IBC	Intermediate bulk container
IPART	Independent Pricing and Regulatory Tribunal of NSW
IMS	Integrated Management System
ISO	International Standards Organisation
ISO 14001:2015	Environmental management systems – Requirements with guidance for use
ISO 55000:2014	Asset management – Overview, principles and terminology
ISO 55001:2014	Asset management – Management systems – Requirements
kW	Kilowatt
L	Litre
Licence	Sydney Water Operating Licence 2019-2023
LTV	Long term value
Maximo	Asset management system
ML	Megalitres
NSW Health	NSW Ministry of Health
OCP	Operational Control Point
OOS	Out of service
PMs	Preventative maintenance schedules
Reporting Manual	Sydney Water Reporting Manual Operating Licence 2019-2023 (IPART November 2019)
RWQMP	Recycled Water Quality Management Plan
RWQMS	Recycled Water Quality Management System

Item	Detail
ROV	Remotely operated vehicles
RPZ	Reduced pressure zone
SAP	Enterprise software to manage business operations and customer interactions
SCADA	System Control and Data Acquisition
SDP	Sydney Desalination Plant
SOP	Standard operating procedure
SPS	Sewer pump station
STV	Short term value
SWC	Sydney Water (Corporation)
SWIRL	Sydney Water Incident Recording and Learning System
SWIM	Safe work method statement
TIACO	Risk review tool
WFP	Water Filtration Plant
WQMS	Water Quality Management System
WRP	Water Recycling plant
WSAA	Water Services Association of Australia

1 Introduction

1.1 **Objectives**

The objective of this engagement was to conduct an audit of Sydney Water's performance against the terms and conditions (as defined in the audit scope) of its operating licence and any other Ministerially-imposed requirements for the period from 1 July 2019 to 30 June 2020, including:

- Sydney Water Operating Licence 2019-2023
- Sydney Water Reporting Manual Operating Licence 2019-2023
- IPART's Audit Guideline Public Water Utilities (July 2019)
- IPART's Sydney Water Operational Audit 2019 Report to the Minister.

The Atom Consulting team also audited existing recommendations outstanding from previous audits and expressed an opinion on progress to meeting or closing-out these recommendations.

1.2 Audit method

Audit scope

The scope of the audit was:

- The operational licence clauses listed in Table 3. These clauses have been selected by IPART on a risk basis.
- Recommendation 2019-01: Water Quality (Drinking water) clause 2.1.1
- Recommendation 2019-02: Water Quality (Drinking water) clause 2.1.2
- Recommendation 2019-03: Water Quality (Drinking water) clause 2.1.2
- Recommendation 2019-04: Water Quality (Drinking water) clause 2.1.1
- Recommendation 2019-05: Water Continuity Standard Clause 4.2.2
- Recommendation 2019-06: Environmental indicators Clause 6.2.1

The audit covers the period from 1 July 2019 to 30 June 2020.

Section	Clause	Sub clauses		
1 Licence Context	1.7 – Pricing	1.7.1		
3 Water Conservation and	3.1 – Economic approach for water conservation	3.1.1, 3.1.2, 3.1.4		
Planning	3.2 – Water Planning	3.2.4		
4 Performance Standards	4.1 – Drinking Water	4.1.1, 4.1.3		
for Water Quality	4.2 – Recycled Water	4.2.1, 4.2.3		
5 Performance Standards	5.1 – Water Continuity Standard	5.1.1, 5.1.2		
for Service Interruptions	5.2 – Water Pressure Standard	5.2.1, 5.2.5		
	5.3 – Dry Weather Wastewater Overflow Standard	5.3.1		

Table 3. Licence sections within the 2019-20 audit scope

Section	Clause	Sub clauses
	5.5 – Asset Management	5.5.1, 5.5.2
6 Customers and Consumers	s and 6.4 – Assistance Options for Payment Difficulties and Actions for Non-Payment	
	6.5 – Family Violence	6.5.1, 6.5.2
8 Information and Services for Competitors	8.1 – Negotiations with WIC Act licensees and Potential Competitors	8.1.1
	8.3 – Code of conduct	8.3.1
10 Performance Monitoring 10.2 – Reporting and Reporting		10.2.2, 10.2.4

Audit standard

In conducting the audit, the auditors are following IPART's Audit Guideline Public Water Utilities (July 2019).

Regard was also given to the following standards and codes, especially where these provided specific detail that is appropriate to the audit:

- ASAE 3100 (2017) Compliance Engagements issued by the Auditing and Assurance Standards Board
- AS/NZS ISO 19011:2019 Guidelines for auditing management systems
- AS/NZS ISO 9001:2016 Quality management systems Requirements
- ISO 17021:2015 Conformity Assessment Requirements for bodies providing audit and certification of management systems (contains principles and requirements for the competence, consistency and impartiality of the audit and certification of management systems of all types)

Audit steps

The audit process was conducted as described in IPART's Audit Guideline Public Water Utilities (July 2019).

Audit team

The audit team and audit qualifications are provided in Table 4.

Team Member	Details
Dr Annalisa Contos	Dr Annalisa Contos holds the following auditor qualifications:
Atom Consulting	A registered Exemplar Global lead auditor (Certificate No. 113465):
Lead auditor	 Exemplar Global -DW (Drinking Water)
	 Exemplar Global -BW (Brinking Water) Exemplar Global -BW (Becycled Water)
	 Exemplar Global TL-ALL (Lead Auditor)
	 Skill Examiner
	NISW IPART (Independent Pricing and Regulatory Tribunal) gualified:
	 Lead Auditor Licence and Regulatory Compliance
	 Lead Auditor and Area Specialist Infrastructure Performance
	 Lead Auditor and Area Specialist Drinking Water Quality
	 Lead Auditor and Area Specialist Berycled Water Quality
	 Lead Auditor and Area Specialist Sewage Management
	Area Specialist Environmental Management
Stephen Walker	Mr Stephen Walker holds the following auditor qualifications:
Cardno	World Partners in Asset Management Certified Asset Management Assessor
Auditor	No. 59 (www.wpiam.com). This accreditation demonstrates compliance with
	ISO 17021-5 Competence requirements for auditing and certification of
	asset management system.
	• A registered Exemplar Global lead auditor (Certificate No. 638040):
	 Exemplar Global TL-AU (Lead Auditor)
	NSW IPART (Independent Pricing and Regulatory Tribunal):
	 Lead Auditor and Area Specialist Infrastructure Performance
	 Lead Auditor Licence and Regulatory Compliance
	 Lead Auditor and Area Specialist Sewage Management
	 Lead Auditor and Area Specialist Retail Supply
Natalie Crawford	Natalie Crawford holds the following auditor qualifications:
Atom Consulting	A registered Exemplar Global lead auditor (Certificate No. 130608):
Auditor	 Exemplar Global -DW (Drinking Water)
	 Exemplar Global -RW (Recycled Water)
	 Exemplar Global TL-AU (Lead Auditor)
	 NSW IPART (Independent Pricing and Regulatory Tribunal) qualified:
	 Auditor Licence and Regulatory Compliance
	 Auditor and Area Specialist Drinking Water Quality
	 Auditor and Area Specialist Recycled Water Quality
	 Area Specialist Environmental Management
Steven Contos	Steven Contos holds the following auditor qualifications
Atom Consulting	Exemplar Global -DW (Drinking Water)
Quality Assurance	Exemplar Global -RW (Recycled Water)
	• Exemplar Global -AU (Auditor)
Geoffrey Kleu	Mr Geoffrey Kleu is a Senior Asset Management Engineer and holds the
Cardno	following qualifications:
Field verification	Bachelor of Engineering (Mechatronics) Honours (Class I)

Table 4. Audit team members and their qualifications

Audit grades

The audit grade definitions used in assessing the auditee's performance against the requirements are set out in Table 5.

Table 5. Audit grades	
Audit finding	Description
Compliant	Sufficient evidence is available to confirm that the requirements have been met.
Compliant (minor shortcomings)	Sufficient evidence is available to confirm that the requirements have been met apart from minor shortcomings which to date have not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes
Non-compliant (non- material)	Sufficient evidence is not available to confirm that the requirements have been met and the deficiency does not adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes
Non-compliant (material)	Sufficient evidence is not available to confirm the requirements have been met and the deficiency does adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes
No requirement	There is no requirement for the utility to meet this criterion within the audit period

Source: Audit Guideline Public Water Utilities (July 2019).

1.3 Regulatory regime

Sydney Water operates largely in a NSW context but must also have regard to matters outside of that jurisdiction, where those matters may affect how it does business. A summary of the key legal and regulatory instruments for Sydney Water is provided in Table 6.¹

Table 6. Key legal and formal instruments relevant to Sydney Water operating licence²

Instrument	Relevance
Competition and Consumer Act 2010 (Cth)	An Act for the promotion of competition and fair trading and provision for consumer protection. Could apply to the 'fitness for purpose' of any product or service supplied
Current version of the Australian Drinking Water Guidelines and Australian Guidelines for Water Recycling	These guidelines are called up under Sydney Water's Operating Licence obligations
Government Information (Public Access) Act 2009 (NSW)	Information may be requested from Sydney Water, which relates to aspects of the licence
Sydney Water Act 2014 (NSW),	An Act which establishes Sydney Water, defining the functions and objectives of Sydney Water

¹ Intended to be illustrative, not exhaustive, for the purposes of this report.

² Where legislation is identified in this table, a reference to that legislation should be taken to include any Regulation/s made pursuant to it.

Instrument	Relevance
Sydney Water Operating Licence 2019-2023	A licence issued by the Governor under section 12 of the <i>Sydney Water Act 2014</i> , which enables Sydney Water to provide relevant services within its area of operations. This licence also gives effect to the operational audits (this audit) to which Sydney Water is subject
Independent Pricing and Regulatory Tribunal Act 1992 (NSW)	Allows for the regulation of utilities such as Sydney Water including the administration and auditing of licences and pricing functions
Memorandum of Understanding with NSW Health 2016	Sets out the working relationship between NSW Health and Sydney Water
Memorandum of Understanding with Environment Protection Authority 2015	Sets out the working relationship between the Environment Protection Authority and Sydney Water
Public Health Act 2010 (NSW)	The objectives of this Act are to protect and promote public health, control risks to public health, promote the control and prevent the spread of infectious diseases and recognise the role of local governments in protecting public health. Supporting Regulations are intended to support the smooth operation of the Act. Sydney Water has obligations under this Act including notifying the Minister of any situation that is likely to be a risk to public health

1.4 Quality assurance process

Our quality assurance approach to this audit involved peer review from a qualified auditor who was not part of the on-site team. This process commenced at the development and submission of the audit questionnaires. Checks of information received were conducted and included aspects such as dates for audit scope compliance, veracity of information, coverage of the subject area being audited and depth of implementation. Professional scepticism (as per ASAE 3100) was applied as part of the document review and on-site audit. Auditors liaised frequently with each other. Support auditors were used for clauses where the audit load was heavy.

Throughout the audit report writing process, the documentation was proofread and cross-checked by the audit team members. An overall quality assurance review was conducted by the audit team leader and a peer review undertaken by a qualified auditor who was not part of the on-site team.

2 Detailed audit findings

2.1 Site visit report

Site inspections were carried out on 28 October 2020. Four main locations were visited including the Nepean Water Filtration Plant (WFP), the West Camden Water Recycling Plant (WRP), facilities at Prospect and the Camelia Sewer Pump Station.

Nepean Water Filtration Plant

We inspected the Nepean WFP, however due to COVID-19 restrictions we were limited to outdoor areas. We walked through the plant verifying the process flow diagram and viewed the temporary chlorine dosing unit and the under-construction membrane package plant. We viewed the turbidity online analysers and checked the calibration stickers; we were provided with calibration certificates for the analysers checked. Issues were discussed including:

- fluoride dosing analysers reliability
- previous fluoride dosing incident
- chlorine safety incident near miss
- criticality of the turbidity analysers and the process for analyser changeover following analyser failure.

There was a follow up action to inspect the bird and vermin proofing on the reservoirs in the Nepean Risk Assessment. On the two reservoirs observed, all entries to the tank were covered and mesh was installed appropriately. The tanks have ventilated aluminium roofs and the hatches are locked and alarmed.

The storage reservoirs downstream of the Nepean WFP are located immediately adjacent to the plant and maintained by the network team. The throughput is 12 ML/day on average with a peak of 20 ML/day in summer, serving approximately 26,000 customers

- WS252 has a capacity of 14 ML and is over 30 years old
- WS471 has a capacity of 2 ML and is 7-8 years old. It was built to allow WS252 to be taken offline for maintenance.

WTP operators will go up to on-site reservoirs daily for checks and report any issues to network team. Any work that is required on the reservoirs involves liaison with WFP operations. Operations visit some reservoirs in the broader network regularly for chorine dosing and report issues to the network team.

Discussions with the Lead Engineer, Network and the Operations Lead West - Water and Waste demonstrated an understanding of the assets, their requirements and knowledge of the asset management processes required to ensure continued serviceability. A number of the key issues discussed are summarised below:

- 6 month inspections regime on reservoirs
- ROV inspections for asset conditions are conducted every five years

- Based on results, a Level 2 inspections will be performed as required
- Older (25 years+) tanks have displayed corrosion, otherwise tanks tend to be in good condition
- Chlorine creates corrosion, especially steel roof supports therefore there needs to be increased vigilance in monitoring these assets.

West Camden Water Recycling Plant

At the West Camden WRP we undertook a walkthrough of the plant, verifying the process flow diagram. We observed the CCP monitoring points and discussed the issues associated with the chlorine CCP when the system was not supplying to end users, when different chlorine limits apply for discharge to the environment. Appropriate 'Reclaimed Effluent Do Not Drink' signage was observed throughout. A culture of continuous improvement was seen during the site visit. A good practice was noted that a work order can be raised through SCADA.

The West Camden WRP has a capacity of 20 ML/day. The original plant used a Modified Ludzack-Ettinger treatment configuration, and this was upgraded in the 1990's. The plant has received further upgrades in 2004 and 2010 to increase capacity and performance. It is fed from sewage pump station SPS 440, located adjacent to the plant; SPS 440 is a network asset and not managed by the on-site team. The team is structured as a reliability, operations and maintenance team, with a diverse skill set and capability to manage the facility. Mechanical and electrical maintenance is outsourced and includes a local team of two fitters and one electrician who service the hub. They report to the contract supervisor, who manages maintenance teams for two hubs. The local team performs in house instrument calibrations, checks and valve exercising. The staff indicated the plant handles wet weather events well.

A number of the key issues discussed are summarised below:

- The team holds a quarterly asset condition and criticality review with their reliability engineer, using a tool to review risk. They will then determine the funding source as either maintenance or capital project and then progress the work as per the appropriate process.
- A higher-level workshop for criticality was held recently that was focussed at a process level. There was a desire expressed that it should be rolled out to lower level to capture the asset level.
- It was expressed that the risk matrix in use is set at an organisational / plant level. The team commented that it is difficult to apply at the asset level.
- The decommissioning process was felt to be onerous and the preferred approach is to put equipment out of service (OOS) and remove the associated preventative maintenance schedules (PM's). This allows a backup option in the future if the equipment is needed again.
- Maximo is used as the asset management tool and contains the asset hierarchy. The team demonstrated a sound understanding of the resolution of the hierarchy vs decision making vs costs.

- In terms of budgeting, tasks that are <\$20k are covered by the maintenance budget. They can also source funding from a 'like for like' capital budget.
- Condition monitoring activities are carried out for vibration analysis and oil analysis. There was discussion around the use of thermography, particularly on mechanical items such as bearings. Previously electrical thermography was conducted, but currently none is undertaken.
- A weekly review of PM's, corrective work orders and upcoming work is held. Feedback and improvements to work orders are updated in the system by the local reliability engineer.
- A number of work orders were observed in the system including:
 - work order 82470785 for oil in gearbox of Aerator #2 on IDAL#2 dates completed within scheduled period
 - work order 79002493 for the reservoir chlorine analyser, scheduled May-June 2020, completed on 4/5/2020.

Prospect Facilities

WP0239 – Water pump station

This is the second largest pump station in Sydney, pumping potable water from the treatment plant to the local reservoir at Prospect and the reservoir at Thornleigh (approximately 20 km straight line distance). The facility consists of:

- 7 pumps with online measurement for oil temperature and vibration analysis
 - 4 x 3,000 kW 2 stage pumps for Thornleigh, capable of 20 ML/day
 - 3 x 12,000 kW pumps for Prospect.

Maintenance inspections include lubrication every 2 months, mechanical service every 12 months and electrical service every 6 months on the motors. The overhead crane, RPZ valves and residual current devices have PMs every 4 months. Hard copy manuals are kept on-site, as well as on the system.

The following items were observed while on-site:

- the lifting gear had inspection tags on them, but were dated as next inspection due March 2018.
- waste oil stored in an IBC was not on a self-bunded pallet. Sydney Water should confirm if the pump station is bunded, or if it should be stored on a bunded pallet for environmental protection.

SP1035 – sewer pump station

A folder with a wiring schematic and details was included in the cubicle, along with the risk assessment. The SPS is hosed out on as needed basis. Between 07:00 and 09:00 the well is pumped down to snorkel level to clear the jets. Planned maintenance activities are carried out at 6 months for electrical and 12 months for mechanical tasks.

V30 - Hollow jet valves

Hollow jet valves control the flow from Warragamba dam to Prospect WFP. Flow through the valves is 80% of the potable water consumed in Sydney. The set up includes three valves:

- 1x low flow valve, delivering flow 50-450 L/s
- 2x high flow valves, delivering flow 250-800 L/s
- Turbine used for power generation. At the time of the inspection the turbine was not operating.

The water feed from Warragamba, the upper canal (from the Upper Nepean system) and the return feed from Prospect Reservoir all converge on the same channel that feeds the treatment plant, representing a single point of failure. Given it is an open concrete channel structure, the risk of failure is very low.

Maintenance plans were found to be in place for the jet valves and the hydraulic control units that drive the isolation valves. The hydraulics have been recently upgraded and moved up to the working level out of the valve pits.

Camellia Sewer Pump Station

Sewer pump station (SPS) SP0067 is the second largest in Sydney and conveys one quarter of the total flow to the North Head treatment plant. The dry well pump station feeds two rising mains of 750 mm and 2,100 mm diameters.

Generally, the maintenance strategy is Planned Maintenance tasks at 12 months for mechanical tasks, 6 months for lubrication and 6 months for electrical tasks. Renewal is targeted at 15 years for electronics (control systems), 20 years electrical assets (e.g. motors), 25 years mechanical assets (e.g. pumps) and 80 years civil assets.

Staff explained the key risk to the site is flooding. Additional risks are the electrical supply, older electrical assets and contamination in trade waste. The older pumps, known as conventional single stage pumps are no longer available and there are projects underway to replace them with dry well submersibles. A new pump is currently being installed to increase the overall capacity of the pump station.

Recently, bypass manifolds have been constructed to allow temporary pumping arrangements in the event of the SPS being out of service. Anchor points were installed on the concrete adjacent the valve wells for safe access. Odour control is managed by natural and forced ventilation in the pump room, and a carbon unit on the extraction system from the well.

2.2 Detailed audit findings by clause

Clause 1.7 – Pricing

Clause 1.7.1

Table 7. Clause 1.7.1 compliance grade				
Subclause	Requirement		Compliance grade	
1.7.1	Sydney Water must set the level of fees, charges, and other amounts payable for its Services in accordance with: a) the terms of the Licence; b) the Act; and c) any applicable maximum prices or methodologies for fixing maximum prices determined under the IPART Act.Non-complian (non-material)		Non-compliant (non-material)	
Risk		Target for full compliance		
Failure to comply with the requirements of this obligation presents a risk that Sydney Water is either overcharging its customers or failing to recover the costs of providing the service.		Evidence that Sydney Water has set the level of fees, charges and other amounts payable for its Services subject to the terms of the Licence, the Act and the maximum prices and methodologies determined by IPART.		

Summary of reasons for grade

Sydney Water demonstrated that it has in place appropriate procedures to guide staff to help ensure that prices are correctly calculated and applied. These procedures include steps for independent checks made by staff on the calculation of fees and charges each year, with records to be retained, and the conduct of random audits.

Sydney Water demonstrated that it had set the level of fees, charges, and other amounts payable for most of its services during the audit period in accordance with the relevant IPART Determination. We undertook checking of the calculation for some fees and charges.

However, Sydney Water continued to charge the Sydney Desalination Plant uplift charge for six weeks longer than justified under its pricing Determination which is a noncompliance with the requirements of this clause. There was no overall impact on customers as Sydney Water would alternately have been able to recover these costs through a future adjustment to its service charge therefore the non-compliance is assessed as non-material.

This clause is graded Non-compliant (non-material).

Discussion and notes

This clause requires that Sydney Water set the level of fees, charges and other amounts payable for its services in accordance with the terms of its operating licence, the *Sydney Water Act 1994* (NSW) and any applicable maximum prices or methodologies for fixing maximum prices determined under the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW).

Sydney Water uses a variety of systems to generate, process and issue bills and invoices for fees, charges and other amounts payable for its services. These systems include SAP, PropertyLink, Tapln and Developer Direct.

Sydney Water provided to us a letter from the Chief Executive Officer, IPART to the Managing Director, Sydney Water (19/137), dated 6 May 2019, advising the index to be applied to prices for water, sewerage, stormwater drainage and other services (5.5%), as well as to prices for recycled water developer charges (1.8%). These indices allow prices to be escalated to a 2019/20 price base.

Sydney Water has applied the index of 5.5% to prices for water supply, sewerage, stormwater drainage, recycled water and trade waste services, and ancillary and miscellaneous customer services. As evidence, Sydney Water provided to us a document, dated 31 May 2019, detailing the annual charge in a 2016/17 price base and the annual charge in a 2019/20 price base for each price category. This document was checked, endorsed and approved by Sydney Water, with endorsement and approval provided at managerial levels.

We also observed that Sydney Water has published on its website prices for residential services, non-residential services and other services.

Procedures

Sydney Water has in place an *Implementing IPART determined retail prices* procedure (SWIM 775467, Version 3). This procedure documents the process for implementing IPART-determined retail prices, responsibilities and accountabilities, applicable billing systems, training and competencies, document ownership and document review. The procedure was last issued on 4 June 2019 and was due for review on 30 May 2020.

The responsibilities and applicable billing systems for ancillary charges, such as charges for conveyancing certificates, are documented in Appendix 1 to the *Implementing IPART determined retail prices* procedure (SWIM 789261).

Sydney Water also has in place a number of supporting detailed procedures, work instructions and tools relating to specific price categories and billing systems:

- Annual IPART price changes & others procedure
- Update e-Developer Ancillary Service Charges procedure
- RAS: Updating prices for products provided via Property Link procedure
- RAS: Updating prices for products provided via Sydney Water Tap in procedure
- Minor Service Extension price calculation and tracking procedure
- Recycled water developer charges calculation and tracking procedure
- Updating e-Developer CPI For Recycled Water Developer Charges for DSP Areas work instruction
- *e-Developer: Create New DSP calculator for existing and new DSP Area* work instruction
- Recycled water developer charges_existing scheme v2 spreadsheet
- Recycled water developer charges_new scheme v2 spreadsheet.

Internal audit

In 2019/20, Sydney Water conducted an internal audit into its compliance with IPART's determined prices. As part of this internal audit, 15 price categories were randomly selected by Sydney Water, representing over 90% of the volume and value of the bills issued by Sydney Water. For each price category, Sydney Water collated a sample of evidence, including signed IPART price lists, screenshots of pricing web pages from Sydney Water's website, Sydney Water bills, and invoices from PropertyLink brokers/Sydney Water TapIn. The internal audit, documented in the *Operating Licence pricing audit 2019-20* memorandum (2019/0000281), found no non-compliances and was endorsed and approved at managerial levels.

SDP uplift charge

Sydney Water's pricing Determination includes an uplift to enable it to recover additional costs when the Sydney Desalination Plant is in operation. This Determination sets out that this uplift is triggered if Sydney Desalination Plant is required to operate the plant under the conditions of its licence or operational approval. The relevant wording of the clause within Sydney Desalination Plant's licence is:

When Available Storage falls below 70%, the Licence Holder must, until the Available Storage rises to 80%, operate and maintain the Water Industry Infrastructure with the objective of maximising the production of drinking water for the exclusive supply into the Corporation's area of operation (as defined in Sydney Water's Operating Licence).

Sydney Desalination Plant also has a minimum 14 month operational period once operation has commenced. When the plant commenced operation due to storages falling below 70%, the 14 month minimum operation period would end on 27 March 2020. Following heavy rainfall, dam levels rose above 80% on 14 February 2020. As the dam levels were above the level for operation in Sydney Desalination Plant's operating licence, it was no longer consistent with IPART's Determination to charge the uplift. Sydney Water chose to continue to charge the uplift. Sydney Water notes in correspondence to IPART that if it had ceased charging the uplift, it would still have been entitled to recover the ongoing costs to operate Sydney Desalination Plant through a future adjustment to the service charge. Therefore, there was no overall impact to customers. Sydney Water also notes that it would have been difficult for it to remove this uplift given the time taken to recalculate fees and charges then generate and send bills to customers.

In response to the draft report, Sydney Water noted that there was little time and it was practically difficult to cease the Sydney Desalination Plant uplift charge. Sydney Water considers that ceasing the charge then recovering the same amount in a later bill would have resulted in an inferior customer experience, as well as increased costs and administration for itself. We note these comments, but this does not alter that Sydney Water was not in compliance with this clause.

The Tribunal has considered the representation made by Sydney Water and concluded that its charging of the Sydney Desalination Plant uplift charge represents a non-

material non-compliance with this clause of its operating licence. We agree with this assessment.

Conclusion

Sydney Water demonstrated that it has in place appropriate procedures to guide staff to help ensure that prices are correctly calculated and applied. These procedures include steps for independent checks made by staff on the calculation of fees and charges each year, with records to be retained, and the conduct of random audits.

Sydney Water demonstrated that it had set the level of fees, charges, and other amounts payable for most of its services during the audit period in accordance with the relevant IPART Determination. We undertook checking of the calculation for some fees and charges.

However, Sydney Water continued to charge the Sydney Desalination Plant uplift charge for six weeks longer than justified under its pricing Determination as it was still incurring costs for operation of the plant as the minimum operation period had not ceased. There was no overall impact on customers as Sydney Water would have been able to recover these costs through a future adjustment to its service charge.

Recommendations

Recommendation 1.7.1-1: By 28 February 2021 (in advance of the updating of charges for the next financial year), Sydney Water must review its operating procedures to ensure that they reflect the requirements relating to any uplift charges for the Sydney Desalination Plant (noting that the 1 July 2020 Determination has different mechanisms for the uplift charge) and update these procedures as required. Sydney Water should also conduct awareness raising around uplift charging requirements for relevant staff, where appropriate.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 3.1 – Economic approach for water conservation

Clause 3.1.1

Subclause	Requirement		Compliance grade
3.1.1	Sydney Water must maintain a wa	ter conservation program	Non-compliant
	consistent with the Current Econo	mic Method.	(non-material)
Risk		Target for full compliance	
If the water con	nservation program is not	Evidence that the water conserver	ation program
consistent with	n the Current Economic Method	reflects the Current Economic M	ethod and in
there is a risk t	hat investment in conservation	particular, that the decision crite	ria for developing the
does not repre	esent good value for money	program reflects the expected ve	alue for water.

Summary of reasons for grade

The *Water Conservation Report* includes a one year and five year forward program. All but one project included in the forward program meets the economic criterion that the levelised cost be lower than the expected value of water. The project that does not meet this criterion has been included due to its implied benefits in areas other than water conservation leading to its benefits being greater than its costs.

The water conservation program is also lacking aspects of a well-formed program, including justification of the size and composition of the program, and details on the governance and controls for identification and inclusion of projects within the program and monitoring their delivery and benefits. As all but one project included in the forward program is consistent with the Current Economic Method, we consider this clause Non-compliant (non-material).

Discussion and notes

Economic Level of Water Conservation Methodology and Water Conservation Report

This clause requires that Sydney Water maintain a water conservation program that is consistent with the Current Economic Method.

Sydney Water has developed a methodology for determining the economic level of water conservation (the Current Economic Method), documented in *Determining Sydney Water's Economic Level of Water Conservation: Part A: The ELWC Methodology*. This methodology describes Sydney Water's approach to calculating the economic level of water conservation, including formulae and input parameters, and was approved by IPART in 2016. Under this methodology, candidate projects are to be selected for inclusion in Sydney Water's water conservation program if the levelised cost of the project is less than or equal to the expected value of water.

Sydney Water's current Reporting Manual requires that it prepare an annual Water Conservation Report. Among other inclusions, the Water Conservation Report must include information on Sydney Water's water conservation program for at least the next five financial years. Accordingly, Sydney Water has prepared a Water Conservation Report for 2019 – 2020, which includes a table (Table 3-3 of the Water Conservation Report) summarising its water conservation program for 2020/21 to 2024/25. For each candidate project, the table outlines:

- The name of the project
- Whether the project meets the economic level of water conservation
- The estimated annual water savings from the project in each year of the water conservation program.

A brief overview of each candidate project is provided in Section 4 of the Water Conservation Report.

We note the following in relation to Sydney Water's water conservation program for 2020/21 to 2024/25:

- A project that did not meet the economic level of conservation (PlumbAssist) is included in the water conservation program. Sydney Water has included this project as it is "aimed to support customers in financial hardship". While this implies that the overall benefit to cost ratio is positive, when including the benefit to customers in financial hardship in addition to water conservation benefits, this logic should be explained to prevent the conclusion that this initiative is uneconomic.
- It is not clear whether "Piloting and development" is included or excluded from the water conservation program. It's also not clear what is actually involved in this initiative as both recycled water schemes and water leakage detection are measured.
- For each project included in the water conservation program, the method to assess the effectiveness of the project is not defined in the Water Conservation Report. This is required under Sydney Water's *Reporting Manual*.
- While an overall levelised cost is provided for each project included in the water conservation program, details on the costs and benefits of each candidate project are not available in the *Water Conservation Report.*
- The water conservation program appears to be largely comprised of existing projects, such as WaterFix Residential, with little consideration of new projects. It is not clear how candidate projects are identified and investigated.
- The investment development and approval process, including governance controls, for the water conservation program is not clear. We note that while this is not included in the Water Conservation Report, there is in place governance as evidenced by Program Control Board and Program Control Group meeting minutes provided to us.

On 23 June 2020, the New South Wales Auditor-General published a report detailing the findings of its performance audit into water conservation in Greater Sydney (*Water conservation in Greater Sydney*). Our commentary above is consistent with the findings of the New South Wales Auditor-General report, which noted a lack of focus on identifying new options and investments, a deficiency in detail and transparency, and an absence of adequate governance arrangements between Sydney Water and the Department of Planning, Industry and Environment. Overall, the New South Wales Auditor-General

report found that Sydney Water had "not met all its operating licence requirements for water conservation".

At a Board meeting on 30 September 2020, Sydney Water acknowledged the New South Wales Auditor-General report and outlined its responses to the findings and recommendations in the report.

Changes to methodology

As of 1 November 2019, the economic level of water conservation methodology can only be changed by the Minister for Water, Housing and Property. Sydney Water advised that, in 2019/20, the Minister for Water, Housing and Property did not issue a direction to update the economic level of water conservation methodology.

Conclusion

This clause requires that Sydney Water's water conservation program is consistent with the Current Economic Method. Most importantly, projects included in the program need to have a levelised cost lower than the value of water that is appropriate for the timeframe of the project. Sydney Water has demonstrated that it has included projects in the program on this basis, except for one project which was apparently included based on benefits in addition to water conservation.

The Water Conservation Report includes little analytical information on the calculation of costs, benefits and levelised costs for projects. We consider that it is an opportunity for improvement that this information be provided to allow greater stakeholder transparency over the development of the program.

We have identified a number of concerns regarding the formation of the water conservation program, as documented in the *Water Conservation Report*. A program is a collection of projects that are delivered in an integrated way to deliver organisational benefits. Programs are composed of projects which are identified as appropriate for inclusion in the program, then delivered and the ongoing costs and benefits monitored. The *Water Conservation Report* acts more as a snapshot of Sydney Water's water conservation program rather than documenting a well-formed program. We consider the following are gaps between what would constitute a well-formed program and that documented in the *Water Conservation Report*:

- For each project included in the water conservation program, the method to assess the effectiveness of the project is not defined in the Water Conservation Report. This is required under Sydney Water's Reporting Manual and is good practice given the uncertainty in the potential benefits of some measures.
- While an overall levelised cost is provided for each project included in the water conservation program, details on the costs and benefits of each candidate project are not available in the Water Conservation Report. This would provide greater confidence that the size and composition of the program is optimal.
- The water conservation program appears to be largely comprised of existing projects, such as WaterFix Residential, with little consideration of new projects or the range of potential options available to Sydney Water. It is not clear how candidate projects are identified and investigated and brought into the program.

We consider that Sydney Water is non-compliant with the requirement of this clause as it has included in its program an initiative for which the levelised cost is above the economic level of water conservation and because the program is lacking some expected good practice elements of works programs. On balance, we consider that the non-compliance is non-material as the fundamental requirement that the economic level of water conservation be considered has been met.

Recommendation

Recommendation 3.1.1-1: Sydney Water must update the Water Conservation Report to include more information on the development, delivery and monitoring of the program. This should include more information on how projects are first identified from the wide range of potential options, assessment of project effectiveness and monitoring of benefits. The structure of this report and content to be included should be developed and then populated for the next water conservation report for the 2020/21 year.

Recommendation 3.1.1-2: By 30 June 2021, Sydney Water must demonstrate measures that have been taken in the 2020/21 financial year to improve its systems and processes used to deliver the water conservation program, including program monitoring and corrective action processes.

Opportunities for improvement

OFI 3.1.1-1: We recommend that Sydney Water includes more analytical information on the benefits, costs and calculation of levelised costs for projects assessed for inclusion in the water conservation program, including projects that are excluded, or included despite being assessed as uneconomic.

Clause 3.1.2

Table 9. Clause 5. 1.2 compliance grade			
Subclause	Requirement		Compliance grade
3.1.2	Sydney Water must implement water conservation measures thatNon-complianthave been assessed as economic as determined by the Current(material)Economic Method.Economic Method		Non-compliant (material)
Risk		Target for full compliance	
If the water conservation program is not implemented, then investment is inefficient and future supply augmentation options may be brought forward		Evidence that conservation measu economic have been implemented delivered or planned for delivery.	ures assessed as d, that is funded and

Table 9. Clause 3.1.2 compliance grade

Summary of reasons for grade

Sydney Water's level of leakage has exceeded the uncertainty band within the economic level of leakage calculation for three years. At the same time, Sydney Water has not implemented a measure it had identified for leakage reduction within the water conservation program.

This clause is graded Non-compliant (material).

Discussion and notes

This clause requires that Sydney Water implement water conservation measures that have been assessed as economic as determined by the Current Economic Method.

As mentioned against Clause 3.1.1, Sydney Water has documented a methodology for determining the economic level of water conservation (the Current Economic Method). Sydney Water also prepares an annual Water Conservation Report, which outlines its water conservation program for the next five financial years and summarises the implementation of this program in the current financial year.

Implementation of water conservation activities in 2019/20

In the Water Conservation Report for 2018 – 2019, Sydney Water selected six projects for inclusion in its water conservation program for 2019/20 to 2023/24, in addition to piloting and development. However, according to the Water Conservation Report for 2019 – 2020, three of these projects (WaterFix Business and Government, WaterFix Small Business and enhanced short-term leakage response) did not incur expenditure in 2019/20. The overall estimated new water savings in 2019/20 was 368 ML/year compared with a forecast of 1,115 ML/year. That is, only one third of the planned water savings were achieved. The three activities that were planned but not implemented were:

- WaterFix Business and Government (forecast 160 ML/year savings)
- WaterFix Small Business (forecast 130 ML/year savings)
- Enhanced short term leakage response.

Sydney Water has identified, in the Water Conservation Report for 2019 – 2020, its reasons for not implementing these projects. For the WaterFix programs, Sydney Water details that:

The development of the program in 2019-20 was focused on building capability and capacity within the organisation to service and support customers. Due to changing conditions including COVID-19 and supplier capacity, the structure of the service offering has been amended to support launch in 2020-21.

With respect to the Enhanced Leakage Detection activity, Sydney Water sets out that:

This initiative did not proceed in 2019-20 as the year was spent getting on top of the backlog and within the Economic Level of Leakage. The scope of the initiative was to increase maintenance crews, increase active leak detection and provide faster response times.

With respect to the reasons given, we note that COVID-19 only impacted the last quarter of the reporting year. Sydney Water also contradicts this as being a constraint on addressing water conservation in section 4.2.1 of the Water Conservation Report where an example is given of how business staff working remotely enabled identification of "multiple significant base flows resulting from concealed leaks". We do not understand why capability and capacity building would be a reason for not delivering activities that had been planned and documented in the previous year's Water Conservation Report.

We discuss leakage management in the following section.

In summary, we observed that in the face of a severe and worsening drought (for the first 7 months of the year), Sydney Water did not follow through on actions that it had previously committed to and which would have improved its water security position and would have delivered economic benefits. The magnitude by which Sydney Water underdelivered is substantial – only one third of the benefits expected were achieved.

On this basis, we consider that Sydney Water did not implement planned water conservation measures as it is obliged to under this licence clause. We discuss the particular area of leakage further following.

Leakage management

The minimum elements of water conservation to be included in the economic level of water conservation methodology were prescribed in Sydney Water's previous operating licence (*Operating Licence 2015 – 2020*). These were:

- Water leakage
- Water recycling
- Water efficiency (including demand management).

These minimum elements of water conservation are reflected in the economic level of water conservation methodology, where the economic level of water conservation is defined as the sum of the estimated annual water savings from all economically viable water leakage, water recycling and water efficiency projects.

Sydney Water advised us that it distinguishes between "day to day" water continuity work, such as leak repairs and active leak detection, and water conservation work.

Sydney Water does not consider that this routine work should be considered water conservation as it is only that which is required to maintain the existing network. Water conservation work (e.g. minimum night flow monitoring and water balance projects) is funded from the water conservation program and provided increased performance with respect to water conservation.

This distinction between "water continuity" and water conservation does not appear to be clear in the economic level of water conservation methodology. It also does not appear to be logical when Sydney Water's performance against the Economic Level of Leakage in recent years is considered, as shown in Figure 1. This figure shows that Sydney Water's leakage performance has exceeded the economic level since 2015/16. Sydney Water has maintained levels of leakage above the economic level for four years or more at the same time as deferring expenditure on leakage measures. Sydney Water's leakage performance has also exceeded the uncertainty band within the economic level of leakage calculation for three years from 2017/18 to 2019/20, coinciding with the official drought period (late 2017 to early 2020, as advised by Sydney Water). While Sydney Water reports, and we accept, that increased leakage has occurred due to the drought, this period of leakage being above the economic level includes pre-drought years and the drought also created impetus for leakage to be more strongly considered.





Source: Updated Water Conservation Report 2019/20

Sydney Water focuses on "enhanced leak response" in its water conservation program which involves "increasing the short-term resources available for leak detection, response and repair consistent with the increased short-run value of water as dams deplete" (2018/19 report). We query why the Water Conservation Program does not contemplate proven, longer term measures in use across Australia and internationally such as monitoring night flows and pressure and more enduring leakage detection. Maintaining levels of leakage above the economic level is, by definition, uneconomic and also inconsistent with maintaining an economic level of water conservation. Sydney Water appears to have had options available to it to reduce leakage which it has not considered for inclusion in its Water Conservation Program and has also not implemented an option to reduce leakage that it assessed as being economic (the enhanced leak response initiative). While Sydney Water has not implemented the enhanced leak reduction initiative, it has undertaken ongoing leakage management activities (which it has not classified as water conservation) as well as active leak detection. However, as the enhanced leak response initiative was not implemented, we conclude that this is further evidence that Sydney Water has not implemented its water conservation program. Considering both:

- the under-delivery of the 2019/20 program where only one-third of the benefits were achieved
- the period of time that the economic level of leakage has been exceeded and the level of exceedance

we conclude that the level of non-compliance is material.

Recommendation

Recommendation 3.1.2-1: Sydney Water must identify, assess, and include where appropriate measures for reducing leakage to below the economic level within its water conservation program. This should be completed for inclusion in the 2021/22 water conservation program.

Opportunities for improvement

No opportunities for improvement have been identified.

Clause 3.1.4

	8		
Subclause	Requirement		Compliance grade
3.1.4	Sydney Water must update the economic level of water conservation using the Current Economic Method: a) for the purposes of clause 3.1.1 and 3.1.2—annually; and		Compliant
	b) or the purposes of clause 3	3.1.3(c)—monthly.	
Risk		Target for full compliance	
If the econom is not update uneconomic i	nic level of water conservation d as conditions change than investment may occur	Evidence that the economic level o updated annually for developing th program and monthly for publishin	f water conservation is ne water conservation ng the economic level.

Table 10. Clause 3.1.4 compliance grade

Summary of reasons for grade

Sydney Water provided calculation spreadsheets to us that demonstrate that it updates the economic level of water conservation at the required frequency. We note that monthly updates for the last two months (although outside the audit period) are also published on Sydney Water's website. This clause is graded Compliant.

Discussion and notes

This clause requires that Sydney Water update the economic level of water conservation annually for the purpose of maintaining and implementing its water conservation program (Clauses 3.1.1 and 3.1.2) and monthly for the purpose of publishing the economic level of water conservation (Clause 3.1.3(c)).

Sydney Water advised that it updates the value of water monthly and that it updates the assumptions used to calculate the value of water at least annually and when a major change has occurred (for example, the commencement of a new IPART price determination). When compared against the levelised costs of candidate water conservation projects, the value of water enables the economic level of water conservation to be determined.

As evidence of its monthly update process for the value of water, Sydney Water provided to us monthly calculation spreadsheets for December 2019 (*Value of Water_Dec 2019.xlsx*) and a recent monthly update in August 2020 (*Value of Water_August 2020.xlsx*).

Sydney Water also provided to us an annual calculation spreadsheet (*Value of Water for 2019-20 Water Conservation Program Report.xlsx*).

We also observed that Sydney Water has published on its website the value of water and economic level of water conservation for the two most recent months (October 2020 and September 2020).

We conclude that Sydney Water has achieved compliance with this clause.

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

No opportunities for improvement have been identified

Clause 3.2 – Water Planning

Clause 3.2.4

Subclause	Requirement		Compliance grade
3.2.4	Sydney Water must implement any action that:Non-complianta) Sydney Water is responsible for delivering under the(material)Metropolitan Water Plan; or(material)		Non-compliant (material)
	b) the Minister directs, in writing, Sydney Water to implement.		
Risk		Target for full compliance	
If Sydney Water does not undertake water planning required of it, water security planning may be less efficient and effective than otherwise		Evidence that Sydney Water has implemented actions required of it under the Metropolitan Water Plan or as directed by the Minister	

Summary of reasons for grade

While we consider that Sydney Water has provided sufficient evidence, as set out above, to demonstrate its compliance with most of the requirements of the Metropolitan Water Plan and the directions of the Minister, it is also required under that Plan to implement its Water Conservation Program. As we concluded for Clause 3.1.2 that Sydney Water did not implement its Water Conservation Program, this clause (Clause 3.2.4) is also considered to be non-compliant.

Sydney Water has provided sufficient evidence to demonstrate that it is compliant with the other requirements of the Metropolitan Water Plan (contribution to Climate Change Fund) and the directions of the Minister.

This clause is considered to be Non-compliant (material).

Discussion and notes

This clause requires that Sydney Water implement any action that it is responsible for delivering under the Metropolitan Water Plan or that it is directed by the Minister to implement.

The Metropolitan Water Plan was last updated in 2017. Under the 2017 Metropolitan Water Plan, Sydney Water is explicitly required to:

- Finalise the Water Conservation Report by September 2017 and prepare this annually
- Implement the measures in the Water Conservation Report as required
- Contribute to the Climate Change Fund to provide funding for the WaterSmart Cities program (\$7.12 million) in 2017 2020.

As mentioned against Clause 3.1, the Water Conservation Reports for 2018 – 2019 and 2019 – 2020 were provided to us. However, three of the projects included in Sydney Water's water conservation program for 2019/20 to 2023/24 were not implemented in 2019/20.

Sydney Water advised that it contributed \$7.12 million to the Climate Change Fund over three years in 2017 – 2020, with a final payment of \$740,000 made on 30 July 2019. As evidence of its final payment, Sydney Water provided to us:

- A letter from the Minister for Energy and Environment to the Minister for Water, Property and Housing (DOC19/216343), dated 19 June 2019, seeking concurrence to order Sydney Water to contribute \$740,000 to the Climate Change Fund in 2019/20
- A letter from the Minister for Energy and Environment to the Managing Director, Sydney Water (DOC19/216343), dated 11 July 2019, confirming the above order
- A letter from the Managing Director, Sydney Water to the Minister for Energy and Environment, dated 25 July 2019, acknowledging the above order
- New South Wales Government Gazette Number 75 ISSN 2201-7534, dated 12 July 2019, publishing the above order
- An e-mail from the Manager, Financial Analysis, Sydney Water, dated 30 July 2019, confirming the payment of a contribution in accordance with the above order.

Sydney Water further advised that, of its contributions to the Climate Change Fund, unspent funds were repurposed to WaterFix. As evidence of both its total contributions and the approval to repurpose unspent funds to WaterFix, Sydney Water provided to us a letter from the Principal Policy Advisor, Sydney Water, dated 29 July 2019. This letter confirmed Sydney Water's total contributions to the Climate Change Fund as well as confirmation from the Minister for Energy and Environment to repurpose unspent funds to WaterFix.

On 2 January 2019, Sydney Water received a direction from the Minister for Energy and Utilities (IRF18/6620) to complete the following activities in 2019/20:

- Develop a joint Sydney Water and WaterNSW Long-Term Capital and Operational Plan by December 2020
- Develop a joint Sydney Water and WaterNSW Emergency Drought Response Plan by December 2020.

These directions were subsequently included in Sydney Water's operating licence (Clause 3.2.1). In May 2020, the Minister for Water, Property and Housing (B20/3655) extended the deadline for the submission of the above plans to 1 December 2021, with the draft Long-Term Capital and Operational Plan anticipated to be submitted by 1 June 2020 and the draft Emergency Drought Response Plan requested to be submitted by 23 December 2020.

As evidence of these directions, Sydney Water provided to us a letter from the Minister for Energy and Utilities to the Managing Director, Sydney Water, dated 2 January 2019, and a letter from the Minister for Water, Property and Housing to the Managing Director, Sydney Water (undated).

Sydney Water advised that it has submitted the draft Long-Term Capital and Operational Plan.

While we consider that Sydney Water has provided sufficient evidence, as set out above, to demonstrate its compliance with most of the requirements of the Metropolitan

Water Plan and the direction of the Minister, it is also required under that Plan to implement its Water Conservation Program. As we have assigned a grade of non-compliance for 3.1.2, this clause is also non-compliant.

Recommendation

Refer to Recommendation 3.1.2-1 under Clause 3.1.2.

Opportunities for improvement

No opportunities for improvement have been identified.

Clause 4.1 – Drinking water

We commend Sydney Water on their continuous improvement in the maintenance and implementation of their DWQMS. The requirements and obligations of the DWQMS were well-understood and embedded at the operational level.

Clause 4.1.1

Table 12. Clause 4.1.1 compliance grade				
Subclause	Requirement		Compliance grade	
4.1.1	Sydney Water must maintain a Management System that is consistent with the Australian Drinking Water Guidelines and any requirements relating to Drinking Water specified by NSW Health (the Drinking Water Quality Management System)		Compliant (minor shortcomings)	
Risk		Target for full compliance		
Without a Water Quality Management System, the risk posed to public health from non-compliance with this clause could be significant.		Systems and processes in place that meet the requirements of the Australian Drinking Water Guidelines Framework for Management of Drinking Water Quality and ensure the Water Quality Management System remains up to date.		

Summary of reasons for grade

Sydney Water has demonstrated that it is maintaining a management system consistent with the ADWG. Shortcomings have been identified in the following areas:

- gaps in documentation on the annual operational review process; with the procedure provided silent on the extent of changes that can be made in an annual review without external stakeholders present
- inconsistencies in the Corporate Risk Matrix consequence descriptors for Public Health and Illness /Injury
- inconsistencies in currency of risk procedure documentation
- currency of the emergency contact list.

A number of areas of good practice were noted during the audit including comprehensive documentation and processes for water quality review. Sydney Water has appointed a Head of Water Quality (or custodian). This role, which commenced in April 2020 provides water quality leadership, specialist advice, guidance and coaching, and actively supports day-to-day operations. We have seen sufficient evidence to confirm that the requirements have been met apart from shortcomings identified, which to date has not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes. This clause is graded Compliant (minor shortcomings).

Discussion and notes

Sydney Water has an overarching Drinking Water Management Manual that outlines how the organisation addresses its obligations to have a Drinking Water Quality Management System (DWQMS). This Drinking Water Management Manual is the roadmap for their DWQMS and is supported by documents and processes that apply across the organisation.

In considering the 'maintain' requirement of this clause, we have audited the water quality management system against the requirements of the ADWG Framework for Management of Drinking Water Quality (the Framework) and tested where documents have been maintained (i.e. that they remain current). The audit scope was for Elements 2 – 7 and 10 – 12 of the Framework.

During the audit, we focussed on application of the DWQMS for Nepean WFP.

Element 2 Assessment of the drinking water supply system

Water supply system analysis

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to assemble a team with appropriate knowledge and expertise; construct a flow diagram of the water supply system from catchment to consumer; assemble pertinent information and document key characteristics of the water supply system to be considered and periodically review the water supply system analysis, apart from a shortcoming identified in the process for undertaking annual operational risk reviews.

Water supply system analyses are reviewed prior to annual operation risk reviews and major five year catchment-to-customer risk reviews.

The makeup of assessment teams is described in the *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* (D0000799, v3, 18/8/2020).

Separate evidence of consultation with NSW Health indicated a requirement for a NSW Health representative to be present when public health risks are assessed (email correspondence between NSW Health and Sydney Water, dated between 25/10/19 and 20/11/19).

A shortcoming is noted that there is a lack of clarity on the scope of the annual operational risk review in the *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* (D0000799); particularly in regards to the extent of change that can be made to risk rankings and the requirements for a NSW Health representative to be present when public health is assessed. The requirement to include external stakeholders (NSW Health and WaterNSW) at the three yearly detailed review and not the annual operational review is only considered appropriate if public health risks are not changed in the annual review. It is noted that public health risk
rankings were changed in the Nepean WFP annual risk review (KnowRisk Register) with only internal stakeholders present when following the current procedure (refer to clause 4.1.3). We acknowledge the evidence provided by Sydney Water on the updated *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* (D0000799). However, as this evidence is dated after the audit period and first audit report, we have made a recommendation in line with the IPART audit guidelines.

Sydney Water have a process in place for the development of process flow diagrams, *Work Instruction for Creation of Process Flow Diagrams* (D0000685; dated 18/06/2018). This document is current and comprehensive. A flow diagram was provided for the Nepean WFP (D0000866D; 14 October 2019) as evidence of this process being maintained and was found to be consistent with the requirements of the work instruction.

Assessment of water quality data

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component (assemble historical data from source waters, treatment plants and finished water supplied to consumers; list and examine exceedances; assess data using tools such as control charts and trends analysis to identify trends and potential problems) apart from a shortcoming identified in the process for undertaking annual operational risk reviews.

Sydney Water has a process in place for assembling and assessing historical water quality data (BMIS0249 for catchment to consumer risk reviews and D0000799 for operational water quality risk assessments). Briefing papers compile the information prepared for catchment to consumer and detailed operational risk reviews and annual system performance reports for annual reviews. The extent of historical analysis is dependent on the type of assessment being undertaken. This approach is appropriate.

Hazard identification and risk assessment

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component apart from shortcomings identified with inconsistencies in the risk matrix and currency of risk documentation. The requirements of this component are:

- identify existing preventive measures from catchment to consumer for each significant hazard or hazardous event and estimate the residual risk
- evaluate alternative or additional preventive measures where improvement is required
- document the preventive measures and strategies into a plan addressing each significant risk.

Sydney Water's approach to risk management is set out in the *Risk Management Policy* (QMAF0003). Requirements for risk assessment are set out in the catchment-tocustomer risk reviews procedure (BMIS0249) and the operational water quality risk assessment SOP (D0000799). Sydney Water reported (Annual Compliance report) one significant change to the Drinking Water Management System in the audit period, which was a change to the Public Health risk consequence descriptors in the *Corporate Risk Matrix* (800991; dated 1/07/2019). The public health consequence descriptions changed from descriptive and semi-quantitative to quantitative. There were also changes made to some risk rankings.

Inconsistencies are noted between the consequences assigned to public health (exposure to unsafe product, through the number of people exposed) compared with the injury / illness (harm to health and wellbeing) category. Examples of consequences are provided in the *Corporate Risk Matrix*; Walkerton is provided as an example of a major public health consequence, where it is noted that there were six deaths and widespread sickness; inconsistent with the illness/injury category, where multiple fatalities are ranked as being an extreme consequence.

Discrepancies in risk documentation were identified. The Risk Management Procedure (1045159, v1, dated 16/03/2020) states in the document control that it supersedes the document *QMAF0081 Guide A: Risk Assessment* (dated 06/08/2018).

The *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* (D0000799, dated 18/08/2020) references QMAF0081 and the old risk matrix and consequence descriptors. This procedure includes the output of the alignment of risk rankings across Sydney Water's WFPs and Build Own Operate (BOO) WFPs (A Shared Understanding of Risk for Sydney Water's Water Supply Systems: Review via a Risk Framework Working Group – outcome summary report). No evidence was provided that this assessment has been updated to include the new risk matrix and consequence descriptors.

Risk assessment documentation (*Briefing Paper – Water Quality Risk Assessment, Nepean WFP Package Membrane Plant*, May 2020) carried out after 16/03/2020 also refers to the superseded QMAF0081 document. Sydney Water advised in the interviews that both documents (QMAF0081 and 1045159) remain current as the updated risk matrix is implemented across systems during the site-specific system detailed risk reviews. A shortcoming is noted around inconsistencies across documents and documentation of this changeover; including when it is appropriate to use which document / risk matrix.

Element 3 Preventive measures for drinking water quality management

Preventive measures and multiple barriers

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to:

- identify existing preventive measures from catchment to consumer for each significant hazard or hazardous event and estimate the residual risk
- evaluate alternative or additional preventive measures where improvement is required
- document the preventive measures and strategies into a plan addressing each significant risk.

Preventive measures are documented in the catchment to customer risk assessment and site-specific controls with within the site-specific KnowRisk registers. Nepean WFP KnowRisk register was provided as evidence. Sample controls for public health risks were checked and are appropriate.

Key controls relating to drinking water quality are specified in the *Drinking Water Product Specifications* (IMS0152.01). System integrity is included as an operational control point, while key performance indicators were added in the audit period for flow-testing of recycled water properties.

Additional measures are identified during the risk assessment workshops and documented in the risk assessment output documentation. Actions are entered into the improvement plan or interface register. Subject matter experts are used to determine which actions should be entered into which system.

Critical control points

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to assess preventive measures from catchment to consumer to identify critical control points; establish mechanisms for operational control and document the critical control points, critical limits and target criteria.

Critical control points are identified in the Drinking Water Product Specification (IMS0152.01) and are considered appropriate. Additional scheme specific controls and critical control point actions are assessed in the risk assessment process and documented in scheme specific KnowRisk registers and scheme specifications. The *Nepean Process Specification - Western Water Hub* (WTNE5019) documents the target criteria, critical limits and corrective actions for water quality parameters at Nepean WFP. This document is current and control limits have been set consistent with the requirements of the ADWG. Membrane filtration (pressure decay testing) was added as a CCP in the audit period (23/04/2020). This change was documented in the specification Document Control - Change History. The *Nepean Process Specification -Western Water Hub* (WTNE5019) refers to calculation of C.t through a C.t model managed by the Process Manager. The model was viewed as evidence of maintenance.

Element 4 Operational procedures and process control

Operational procedures

Sydney Water has provided sufficient evidence that it had met the ADWG requirements to identify procedures required for processes and activities from catchment to consumer and document all procedures and compile into an operations manual.

Operational procedures are documented in BMIS. Sample procedures, their version control details, dates and required review dates were sighted in the database. The filtration work instruction (WWTNE5004) was current and due for review on the 31/10/20. Some documents were marked as expired, it was advised these are being superseded by other documents.

Evidence was provided of the *Rechlorination Plants Process & Equipment Workflow Standard Operating Procedure* (RE5320) applicable to the temporary dosing chlorination unit at Nepean WFP. The document is current (12/7/2019).

Operational monitoring

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to develop monitoring protocols for operational performance of the water supply system (including the selection of operational parameters and criteria and the routine analysis of results) and they have documented monitoring protocols into an operational monitoring plan.

Monitoring protocols for operational system performance are documented into a Monitoring Plan. The *Monitoring Plan – Annual Drinking Water Quality Plan 2019-2020* (BMIS0045) and the *Monitoring Plan – Drinking Water Operational monitoring plan 2019-20* (BMIS0045.01) were provided as evidence of the currency of the monitoring plan. These plans include raw, treated, sampling parameters, schedules, locations, frequencies and guideline limits. The *Drinking Water Product Specification* (IMS0152.01) details monitoring required for process barriers. *Nepean WFP Process specification* (WTNE5019, dated 21/10/2019) details specific operational monitoring requirements, criteria and corrective actions for Nepean WFP.

Corrective action

Sydney Water has provided sufficient evidence to demonstrate the ADWG requirements to establish and document procedures for corrective action to control excursions in operational parameters and establish rapid communication systems to deal with unexpected events have been met.

The *Non-conformance and Corrective Actions procedure* (SDIMS0011, v5, dated March 2018) describes the general process for corrective actions for non-conformances. The *IMS Work Instruction for Triggers, Notifications and Actions for Adverse WQ Results* (WPIMS5274, v8, 4/7/2018) documents the process for communicating adverse water quality from compliant, operational and repeat sampling programs.

The *Nepean Process Specification Western Water Hub* (WTNE5019, dated 21/10/2019) was provided as evidence of Nepean WFP documentation of corrective actions for target and critical limit criteria. Corrective actions are provided for raw water, process water and treated water parameters. This document is current and comprehensive.

Equipment capability and maintenance

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to ensure that equipment performs adequately and provides sufficient flexibility and process control and to establish a program for regular inspection and maintenance of all equipment, including monitoring equipment.

Maximo is used to generate work orders for preventive maintenance. SOPs and schedules for equipment calibration are recorded and accessed through the Business Management Information System (BMIS). Water quality monitoring instruments are

calibrated in accordance with site-specific schedules. Checks are made daily of online instruments. The *Nepean Water Filtration Plant Equipment Master List* (WTNE5033; dated 30/4/2018) was provided as evidence of a calibration schedule for Nepean WFP.

Materials and chemicals

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to ensure that only approved materials and chemicals are used and to establish documented procedures for evaluating chemicals, materials and suppliers.

Approved treatment chemicals are detailed in the *Approved List of Chemicals in Sydney Water and Change Management Process SAP Procedure* (D0000643). This document includes chemicals and their technical specifications and the procedure for trialling and evaluating new chemicals.

The Western Water Hub Bulk Chemical Delivery Integrated Management System (D0001375) details the work instruction for receiving and unloading of bulk chemicals, including system specific details and checklists for accepting chemical deliveries.

While *AS/NZS 4020 Testing of products for use in contact with drinking water* was updated in 2018, many products are still certified to AS/NZS 4020:2005. Sydney Water provided evidence of significant engagement with suppliers to try to get products certified with the new standard. Sydney Water also provided evidence of engagement with the Water Services Association of Australia (WSAA). Sydney Water prepared the *Deviation from Standards* (D0001738, dated 15/6/2020) where deviations from standards are recommended.

Element 5 Verification of drinking water quality

Drinking water quality monitoring

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component (determine the characteristics to be monitored in the distribution system and in water as supplied to the consumer; establish and document a sampling plan for each characteristic, including the location and frequency of sampling; ensure monitoring data are representative and reliable).

Monitoring protocols for verification system performance are documented into a Monitoring Plan. The *Monitoring Plan – Annual Drinking Water Quality Plan 2019-2020* (BMIS0045) was provided as evidence of the currency of the monitoring plan. The plan includes sampling parameters, schedules, locations, frequencies and guideline limits. A 5-year drinking water quality plan (DD_1025757) provides a rationale in the 'Key risk area / comment' column for inclusion of parameters in annual monitoring plans against characteristics included in the ADWG.

Consumer satisfaction

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to establish a consumer complaint and response program and conduct appropriate training of employees.

The *Managing Water Quality Complaints Procedure* (dated 17/09/2019) documents the process for managing customer complaints. This document includes water quality complaints related to health, dirty water, taste and odour and burnt water meters. The procedure was issued during the audit period. Water quality complaints from an area with a Recycled Water Supply Scheme area are attended as a higher priority, with a response time of 1 hour, all others within 4 hours. The Area Water Quality Scientists are responsible for responding to and managing water quality complaints. The process for training water quality scientists is documented in the *Development Program for Water Quality Scientist Procedure* (D0001673).

Short term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to establish procedures for the daily review of drinking water quality monitoring data and consumer satisfaction and develop appropriate reporting mechanisms both internally and externally.

The process to review drinking water quality data is documented in a number of documents. *On Line Monitoring & Control of Assets via IICATS Integrated Management System* (HOG5214, v 5, dated 14/01/2020) details the reporting frequency and mechanism for process monitoring. The process to review consumer satisfaction is documented in the *Managing Water Quality Complaints Procedure* (dated 17/09/2019).

Mechanisms of internal and external reporting are documented in the *Drinking Water Quality Event Management SOP* (WPIMS5228). A spreadsheet of water quality management contacts was provided as evidence (D0001088), however contacts were not up to date, with one contact having left the organisation at least 6 months prior; additionally staff roles were not current.

Corrective action

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to establish and document procedures for corrective action in response to non-conformance or consumer feedback and establish rapid communication systems to deal with unexpected events.

The Drinking Water Quality Event Management Procedure (WPIMS5228, v16, dated 1/6/2020) documents the process for the identification, reporting and notification of water quality events and incidents. The Managing Water Quality Complaints Procedure (dated 17/09/2019) documents the process for responding to customer complaints, including notifications to NSW Health. These documents are current.

The *Non-conformance and Corrective Actions procedure* (SDIMS0011, v5, dated March 2018) describes the general process for corrective actions of non-conformances. The *IMS Work Instruction for Triggers, Notifications and Actions for Adverse WQ Results*

(WPIMS5274, v8, 4/7/2018) documents the process for communicating adverse water quality from compliant, operational and repeat sampling programs.

Communication

Sydney Water has defined communication protocols with the involvement of relevant agencies, prepared a contact list of key people, agencies and businesses, and developed a public and media communications strategy, apart from a minor shortcoming in the currency of the Water Quality Management Contact List.

Sydney Water has a list of key contacts (D0001088). The contents of the contact list are appropriate, however a number of people listed were no longer working in the role listed or had left the organisation. Sydney Water has developed joint communication protocols with WaterNSW (the bulk water supplier) and NSW Health. The protocols document the joint communication approval process and list the responsibilities of each organisation. Incident types are documented with key messages for each incident.

Incident and emergency response protocols

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component (Define potential incidents and emergencies and document procedures and response plans with the involvement of relevant agencies; train employees and regularly test emergency response plans; investigate any incidents or emergencies and revise protocols as necessary).

The Drinking Water Management Manual states that the *Drinking Water Quality Event Management SOP* sets out Sydney Water's approach for identifying, responding to, and escalating drinking water quality events. This procedure documents both treatment and network incidents and includes the incident trigger, event response and reporting and notification requirements. The procedures notes that Water Production is responsible for implementing training in the procedures and Regional Operations & Field Services are responsible for participating in the training of the procedures.

Sydney Water used SWIRL (Sydney Water Incident Reporting and Learnings) to maintain the incident records including notification to NSW Health, additional water quality sampling data and actions.

Element 7 Employee awareness and training

Employee awareness and involvement

Sydney Water demonstrated it has met the ADWG requirement to develop mechanisms and communication procedures to increase employees' awareness of and participation in drinking water quality management.

Sydney Water states in the Drinking Water Management Manual that they achieve employee and awareness through Water Leadership Groups, Water Forum and through training on drinking water management system documentation.

Employee training

Sydney Water demonstrated it has met the ADWG requirements to ensure that employees, including contractors, maintain appropriate experience and qualifications; identify training needs and ensure resources are available to support training programs; document training and maintain records of all employee training. The training program and competency review for a Water Quality Scientist provided sufficient evidence.

The Drinking Water Management Manual states that Compass is used to manage performance and training and for maintaining records of training. We were provided records of site-specific training (Critical instruments SOP training records – Nepean WFP and Chemicals procedures training records) that was stored at the Nepean WTP. During the interview this discrepancy was discussed. Sydney Water advised that training organised through Compass is recorded there, however site-specific training may not be recorded in Compass and is usually held locally.

There is an opportunity for improvement that the Drinking Water Management Manual is updated to reflect the current practice.

Element 10 Documentation and reporting

Management of documentation and records

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to document information pertinent to all aspects of drinking water quality management; develop a document control system to ensure current versions are in use; establish a records management system and ensure that employees are trained to fill out records and periodically review documentation and revise as necessary.

Sydney Water uses BMIS for storing and managing the quality management system documentation. The currency of documents is monitored against agreed KPIs, and reported monthly to stakeholders and management. Formal reviews and version control are managed through BMIS.

Sydney Water uses a range of processes for recordkeeping, documented in the Records Management Procedure (SDIMS0017). Records are saved in Sydney Water systems including SWIM records management system, Maximo (asset management records) and Compass for staff development. Some specific documents are maintained locally.

Currency of procedures is discussed under Element 4 Operational Procedures.

Reporting

Sydney Water has met the ADWG requirements to establish procedures for effective internal and external reporting and produce an annual report to be made available to consumers, regulatory authorities and stakeholders. The Drinking Water Management Manual (BMIS0213) records the reports produced for regulators and the public and the requirement for the reports. Sydney Water does not document the production of an annual (water quality) report for the public. They do produce quarterly drinking water

quality reports for each system, which are made available through their website to the public. As they are reporting more frequently than annually, we consider this requirement met. A procedure to develop the quarterly reports was provided.

There is no line-of-sight between the DWQMS and the parameters to be reported in the quarterly water quality monitoring reports. The IPART Reporting Manual requires:

"In line with clause 4.1.3 of the Licence, Sydney Water must ensure that the DWQMS is implemented and that all relevant activities are carried out to the satisfaction of NSW Health. This includes the characteristics that the DWQMS specifies for inclusion in the Quarterly Water Quality Monitoring Report."

In the interviews we established that Section 4.2 Compliance Sampling in the Annual Drinking Water Quality Monitoring Plan 2019-20 (BMIS0045 01 Ver6) documented these obligations. An opportunity for improvement has been identified to ensure the method by which these obligations are met is explicitly documented in the DWQMS.

Element 11 Evaluation and audit

Long-term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to collect and evaluate long-term data to assess performance and identify problems and document and report results.

The Drinking Water Management Manual states that evaluations are performed in:

- management reviews, including the annual IMS Management Review
- routine public reporting of drinking water quality
- the catchment-to-customer risk review
- the Compliance and Performance Report for water quality
- components of the annual Water Conservation Report relevant to drinking water.

Sydney Water's response to the questionnaire included additional activities such as:

- Monthly control charts for drinking water quality
- Long-term trending for service reservoir and customers taps.

We also noted the *Annual System Performance Summary Report* for Nepean WFP included an excellent summary of water quality performance. During the interviews we were advised this report is produced ahead of the annual operational risk review. The requirement for this is documented in the *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* (D0000799).

We consider this report to exemplify the operationalisation of the drinking water management system (See Clause 4.1.3).

There is an opportunity for Sydney Water to update the Drinking Water Management Manual to provide a clearer line of sight to activities undertaken at the operational level associated with the collection and evaluation of long-term data.

Audit of drinking water quality management

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to establish processes for internal and external audits and document and communicate audit results.

Sydney Water has established a program of quarterly independent audits of the Drinking Water Quality Management System. These were communicated to NSW Health in the 11/11/2019 JOG Meeting (item 7.1). BMIS is used to document the results and close out any identified actions.

Element 12 Review and continual improvement

Review by senior executive

Sydney Water has provided sufficient evidence that demonstrates the ADWG requirements for senior executive to review of the effectiveness of the management system and evaluate the need for change had been addressed.

The *Management Review process* (SDIMS0012) outlines the process for performance review by different levels of management and identifies accountabilities and requires:

- A review of business plan objectives and actions, relevant risks and controls, incident data and associated actions, audit findings and associated actions, and ongoing currency of relevant documentation
- The management review to occur at least annually.

Management reviews are performed for the 'Water Process' which encompasses the DWQMS under Sydney Water's ISO 9001 certified IMS.

Review also occurs as part of the JOG Quarterly meetings, held with NSW Health and the quarterly Strategic Liaison Group (whose members are executive representatives from NSW Health, Sydney Water and WaterNSW).

Drinking water quality management improvement plan

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to develop a drinking water quality management improvement plan and ensure the plan is communicated and implemented, and that improvements are monitored for effectiveness.

Sydney Water's Drinking Water Improvement Plan is comprised of two items:

- the *Product Management Improvement Framework* (BMIS0214) which describes the approach used to identify the improvement programs and initiatives
- the *Product Management Improvement Register* and dashboard which records the improvement actions and initiatives.

The *Product Management Improvement Register* had been maintained, with progress recorded against relevant actions for the quarter 4, 1 and 2 JOG updates.

Sydney Water had processes to communicate and implement the plan including presenting the plan to NSW Health during the quarterly JOG meetings.

In the interviews Sydney Water identified on-going improvements to the management of the drinking water improvement plan to capture research projects and programs (particularly where the research is not conducted by customer delivery). This exemplifies Sydney Water's approach to continuous improvement.

Recommendation

Recommendation 4.1.1-1: By 31 March 2021, document the scope of the drinking water annual operational risk assessment reviews, to ensure that the assessment of public health risks does not occur without a NSW Health representative present.

Recommendation 4.1.1-2: By 30 June 2021, review the Corporate Risk Matrix to rectify inconsistencies between Public Health and Injury /Illness consequence descriptors, including liaison with NSW Health.

Recommendation 4.1.1-3: By 31 March 2021, formalise the process for how the updated risk matrix and risk procedure is being implemented across water supply systems, including resolving inconsistencies in superseded documentation references, particularly noting the *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* procedure.

Opportunities for improvement

OFI 4.1.1-1: Update the Drinking Water Management Manual to provide a clearer line of sight to activities undertaken at the operational level associated with the collection and evaluation of long-term data such as the review of water quality data undertaken for the Annual System Performance Summary Report for the WFP.

OFI 4.1.1-1: Update the Drinking Water Management Manual to formalise where training records are stored (locally at water filtration plants or in Compass).

OFI 4.1.1-3: Specify in the Drinking Water Management Manual how the obligations under Performance Standards for Water Quality in the IPART Reporting Manual Requirement are met (particularly for the compliance monitoring).

OFI 4.1.1-4: Ensure the responsibility for keeping the emergency contact list up to date is clearly documented and the review is undertaken.

Clause 4.1.3

Table 13. Clause 4.1.3 compliance grade					
Subclause	Requirement	Compliance grade			
4.1.3	Sydney Water must ensure that the Drinking Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Drinking Water Quality Management System and to the satisfaction of NSW Health.	Compliant (minor shortcomings)			
	[Note: Sydney Water is to apply the Drinking Water Quality Management System to the Drinking Water system under its control, having regard to the entire Drinking Water supply system – from the water catchment to the Consumer.]				
Risk	Target for full compliance				

Subclause Requirement	Compliance grade
If the Water Quality Management Syste is not fully implemented, there is a high risk that Sydney Water may not be able to effectively manage risks to water quality and protect public health.	 Evidence that the Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Water Quality Management System. Evidence to show that NSW Health is satisfied with the Drinking Water Quality Management System and its implementation.

Summary of reasons for grade

Sydney Water has demonstrated that it is has a fully implemented Drinking Water Quality Management System, apart from shortcomings in the following areas:

- Public health risk rankings were changed in the Nepean WFP annual operational risk review, contrary to the requirement that NSW Health should be present when public health risks are assessed
- Delays in transferring improvement action items identified in the risk assessment to appropriate risk registers

A number of areas of good practice were noted during the audit around water quality performance analysis, including the use of virtual tags in SCADA, the Central SCADA model, development of comprehensive site-specific annual water quality review performance reports and investigations undertaken on fluoride analyser reliability. Comprehensive incident log notes were noted as an area of good practice kept by operational staff during the Nepean WFP raw water quality event.

We have seen sufficient evidence to confirm that the requirements have been met apart from shortcomings identified, which to date has not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes. This clause is graded Compliant (minor shortcomings).

Discussion and notes

The audit scope was for Elements 2 – 7 and 10 – 12 of the Framework.

Evidence was provided of engagement between Sydney Water and NSW Health (email correspondence from NSW Health dated 14/11/19), that NSW Health indicated satisfaction with implementation of the drinking water management systems, would require that Sydney Water:

- *Regularly update the Joint Operational Group (JOG) on implementation of the management system and action on the improvement register*
- Demonstrate a record of consultation with NSW Health prior to the JOG
- Consult NSW Health on significant changes proposed to the management system
- Allow adequate time for consultation with NSW Health and incorporation of feedback prior to significant changes
- Implement a system of internal review of the management system with NSW Health involvement

Evidence was provided of JOG meeting minutes, email correspondences, Drinking Water Quality Annual Compliance Report and Quarterly Reports to NSW Health as evidence of satisfaction. A shortcoming is noted that NSW Health advised the auditors that changing public health risk rankings (that occurred at the Nepean WFP annual risk review) without NSW Health attendance is not considered satisfactory.

During the audit, we focussed on implementation of the DWQMS for Nepean WFP.

The key findings that contributed to the grade for each element are noted below.

Element 2 Assessment of the drinking water supply system

Water supply system analysis

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to assemble a team with appropriate knowledge and expertise; construct a flow diagram of the water supply system from catchment to consumer; assemble pertinent information and document key characteristics of the water supply system to be considered and periodically review the water supply system analysis.

The accuracy of the Nepean WFP process flow diagram (D0000866D; 14 October 2019) was tested during the site visit. Due to COVID-19 restrictions we were limited to outdoor areas. There was consistency with the processes viewed and the interview responses during the site visit against the process flow diagram.

The *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* (D0000799, v3, 18/8/2020) documents the procedure for undertaking operational water quality risk assessments. Evidence provided (Nepean WFP operational risk assessment attendance sheet) was consistent with the requirement for the annual operational water quality review of the assessment team to be formed from treatment / network operations.

The Annual system performance summary report -Nepean WFP 2018-19 (983963) was provided as evidence of the documentation of pertinent information and key characteristics of the water supply system. Sydney Water advised that this document was utilised to inform the annual operational risk review of Nepean WFP. This report included a copy of the current Nepean WFP process flow diagram and a clear system description. Evidence of a process flow diagram for the temporary membrane works, as part of risk assessment documentation was also provided as evidence of implementation.

Assessment of water quality data

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (define the approach and methodology to be used for hazard identification and risk assessment; Identify and document hazards, sources and hazardous events for each component of the water supply system; Estimate the level of risk for each identified hazard or hazardous event; Evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty; Determine significant risks and document priorities for risk management; Periodically review and update the hazard identification and risk assessment to incorporate any changes).

The Annual system performance summary report -Nepean WFP 2018-19 (983963) provided comprehensive analysis of data from the preceding year and was used to inform the annual operational risk review and confirms that the relevant procedure was implemented in practice for annual reviews. While a detailed WFP operational risk review was not undertaken in the audit period, a briefing paper for a Nepean WFP Package Membrane Plan was provided as evidence, which included assessment of raw water quality from 2014/15 – 2018-19.

Hazard identification and risk assessment

Shortcomings were identified with implementation of the requirements of this component, where Sydney Water was required to:

- identify existing preventive measures from catchment to consumer for each significant hazard or hazardous event and estimate the residual risk
- evaluate alternative or additional preventive measures where improvement is required
- document the preventive measures and strategies into a plan addressing each significant risk.

Evidence was provided of an annual operational risk review for Nepean WFP (KnowRisk register – Nepean WFP June 2020). This risk review was tested against the requirements of the *IMS-Operational Risk Assessment Workshop (KnowRisk Review) SOP for Drinking Water* (D0000799). Discussion of the adequacy of this procedure is included in clause 4.1.1.

Public Health risk rankings were changed during the risk assessment (documented in the Risk Comment column) without NSW Health in attendance:

- Risk ID 53476: 'Illness in the community due to inadequate disinfection or underdosing leading to not meeting the critical limit of chlorine' the residual risk reduced from high to medium (with likelihood changing from very unlikely to rare). The basis provided was "no issue with plant performance".
- Risk ID 54087: 'Actions by disgruntled employees leading to malicious damage resulting in poor water quality' the residual risk reduced from high to medium (with likelihood changing from very unlikely to rare). The basis provided was "As per Orchard Hills scoring".

Evidence of consultation with NSW Health indicated a requirement for a NSW Health representative to be present when public health risks are assessed (email correspondence between NSW Health and Sydney Water, dated between 25/10/19 and 20/11/19).

Element 3 Preventive measures for drinking water quality management

Preventive measures and multiple barriers

Sydney Water has provided sufficient evidence to demonstrate implementation of the ADWG requirements for this component apart from a shortcoming identified for the timings with actions being entered into appropriate registers following the risk assessment process. The requirements of this component are to:

- identify existing preventive measures from catchment to consumer for each significant hazard or hazardous event and estimate the residual risk
- evaluate alternative or additional preventive measures where improvement is required
- document the preventive measures and strategies into a plan addressing each significant risk

The Nepean WFP KnowRisk register (June 2020) was provided as evidence for this component:

- preventative measures for sample public health risks were reviewed and considered appropriate.
- sample preventative measures were tested on-site and were found to be in place (online analysers, treatment processes, reservoir integrity).
- Status of actions associated with risk ID54204 'Investigate and confirm the vermin proofing of the CWT and Reservoirs 471, 252 overflow pipes' and 'Investigate the frequency of CWT, and reservoir 471 and 252 inspection and program' was discussed during the audit interview. Sydney Water advised that actions were either tracked through an improvement plan or site-specific interface register and that actions were also tracked through the KnowRisk register. The action 'Investigate and confirm the vermin proofing of the CWT and Reservoirs 471, 252 overflow pipes' had an assigned a date of 12/12/2020 in KnowRisk. The June 2020 improvement plan was provided as evidence and the current draft version viewed during the audit interview (October 2020). There was no evidence that either of these actions had been entered into an improvement plan or interface register at the time of the audit. The time taken since the risk assessment to transferring these actions (greater than three months) into either an interface register or improvement plan is considered a shortcoming.

The *Drinking Water Product Specification* (IMS0152.01) identifies key preventative measures including critical control points, operational control points, their limits and monitoring requirements. System integrity is included as a network operational control point. The specification requires that backflow compliance is reported via the Backflow Prevention Device Inspection and Maintenance Reports. Sample reports were provided as evidence of this requirement (report 360609 dated 27/04/2020; report 360613, dated 26/04/2020 and report 360615 dated 27/04/2020).

Sydney Water advised that a number of cross connections or potential for cross connections were identified between the recycled and the potable water systems within customers properties; evidence of actions taken and notifications made include:

- SWIRL record (INC-29805, 26/03/2020) provided details of the investigations including actions taken and notifications made to NSW Health and Office of Fair Trading.
- SWIRL record (INC-29728, 10/03/2020) a recycled water meter had not been installed; details of the investigation and notifications made to NSW Health and Office of Fair Trading are documented. Evidence was provided (meeting minutes) of this reported at the 18 May 2020 JOG meeting.

A number of spreadsheets were provided as evidence of measures currently being undertaken to identify properties requiring backflow devices. A *Backflow Operation Plan* – *Folio of Progress (June 2020)* tracking spreadsheet was provided. Current progress is considered appropriate.

Critical control points

Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements under this component to assess preventive measures from catchment to consumer to identify critical control points; establish mechanisms for operational control and document the critical control points, critical limits and target criteria.

CCPs were tested through a demonstration of the SCADA systems and data viewed was found to be consistent with CCP documentation. Turbidity shutdown limits were set at 0.1 NTU; permissions to change to this limit were set at 0 – 0.5 NTU; consistent with the CCP limit of 0.5 NTU and requirements in the *Drinking Water Specification* (IMS0152.01).

An area of good practice was noted with the use of virtual tags (a calculated parameter in SCADA that display only required data); for instance, turbidity data is presented only when the outlet is closed allowing visual clarity in checking for exceedances.

SCADA turbidity data for individual and combined filter turbidity was viewed with no CCP exceedances found:

- 13 February 2020 a spike up to 1 NTU from the combined filter was noted to have occurred for 1.5 hours. Evidence was provided that the WFP was offline during this period (Nepean WFP combined turbidity trend_130220).
- Two spikes were noted up to 1 NTU at Filter 2 on the 25 and 28 February; it was confirmed onscreen that both instances occurred for less than 20 seconds; consistent with criteria to notify NSW Health for exceedances greater than 15 minutes.

We noted that chlorination data prior to 12 October 2020 was not available to be viewed in SCADA; as a result of the local cache being deleted when updating the analyser name. We were advised that this data was in the process of being restored to SCADA from the backup. An opportunity for improvement is made to review the process for changing names in SCADA to prevent deletion of local data.

Element 4 Operational procedures and process control

Operational procedures

Sydney Water has provided sufficient evidence to demonstrate implementation of the ADWG requirements through the implementation of identified procedures for processes and activities.

Implementation of the *Western Water Hub Bulk Chemical Delivery Integrated Management System* (D0001375) was tested during the site visit. A delivery docket for sodium hypochlorite (IXOM, 12/06/2020) and a certificate of analysis for sodium hypochlorite (IXOM dated 11/06/2020) were sighted and were consistent with the requirements of the procedure.

We viewed a completed *Nepean WFP Daily Process Equipment Report and Rounds* dated 15/1/2020. We observed that the log sheet had a yes or no answer format which had the potential to be completed incorrectly. While out of the audit date scope, the form had recently been updated and implemented, rectifying this potential issue. No opportunity for improvement is therefore made.

Operational monitoring

Sydney Water has provided sufficient evidence to demonstrate implementation of the Sydney Water has provided sufficient evidence to demonstrate it has met the ADWG requirements to develop monitoring protocols for operational performance of the water supply system (including the selection of operational parameters and criteria and the routine analysis of results).

Operational WFP monitoring is documented through daily inspection sheets, lab analysis records; hardcopy site book and SCADA records. We were provided as evidence the daily log sheet for Nepean WFP for the 8, 9, 10 and 11 May 2020. The Central SCADA system is used to enter the operational monitoring; this was viewed as evidence during the audit interviews.

We viewed how Sydney Water review water quality performance using the SWIFT system for Nepean Water Filtration Plant. Data is utilised from a number of sources (including operational and SCADA data) and used to review rates changes and limits exceptions and produce monitoring reports. This model, included as evidence of the ongoing review of CCP performance is noted as an area of good practice.

We tested the *Drinking Water Operational Monitoring Plan 2019-20*. The monitoring plan requires (section 4.8.1) the Monthly Drinking Water Quality Performance Report to have 'Comments, control charts, boxplots, total chlorine and THM tables, THM graphs and No. exceptions YTD'; these requirements were consistent with that provided in the June 2020 Western Region Drinking Water Performance Report against the Australian Drinking Water Guidelines.

During the interviews we discussed the maintenance of the backflow prevention devices that protect the drinking water systems from backflow from Sydney Water sites. We requested and received the certificates for 7 backflow tests for the RPZs at West Camden STP.

Corrective action

Sydney Water has provided sufficient evidence to demonstrate implementation of the ADWG requirements to establish and document procedures for corrective action to control excursions in operational parameters and establish rapid communication systems to deal with unexpected events.

No CCP exceptions were noted in the SCADA data viewed; refer to Element 3 critical control points for details. Evidence (*Personal Log Sheet* for a rain event water quality incident on the 10/2/2020) was provided of the actions and communications undertaken in response to high turbidity values during rain event at Nepean WFP. The log records increased turbidity testing and changes made to the turbidity shutdown

value (in communication with NSW Health and consistent with CCP limits in the *Drinking Water Specification* and *Nepean WFP Process Specification*).

Equipment capability and maintenance

Sydney Water has provided sufficient evidence to demonstrate implementation of the ADWG requirements of this component (ensure that equipment performs adequately and provides sufficient flexibility and process control; establish a program for regular inspection and maintenance of all equipment, including monitoring equipment).

Calibration frequency specified on the Nepean Water Filtration Plant Equipment Master List (WTNE5033; dated 30/4/2018) was tested on-site. We observed calibration stickers dated 26/10/2020 on the filter 1 turbidity analyser (ATU 3612) and viewed a HACH Ultraturbidimeter maintenance calibration report for the same analyser dated 3/11/2019. This was consistent with the yearly frequency specified in the Equipment Master List.

Sydney Water has a record of continuous improvement around instrument reliability, while outside the scope of the audit a number of investigations into reliability of online instruments was provided as evidence.

Materials and chemicals

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (ensure that only approved materials and chemicals are used; establish documented procedures for evaluating chemicals, materials and suppliers).

We tested the Approved List of Chemicals in Sydney Water and Change Management Process SAP Procedure (D0000643). Sodium hypochlorite is in use at the Nepean WFP, (IXOM dated 11/06/2020) a certificate of analysis for sodium hypochlorite (IXOM dated 11/06/2020) was sighted in alignment with the requirements pf the procedure.

During the site visit at Prospect Pump Station, for chemicals seen on-site, including hydraulic oil (Shell Tellus S2MX46) and epoxy coating (Tankguard412), technical data sheets were checked and the chemicals are appropriate for use in drinking water systems.

Element 5 Verification of drinking water quality

Drinking water quality monitoring

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (determine the characteristics to be monitored in the distribution system and in water as supplied to the consumer; establish and document a sampling plan for each characteristic, including the location and frequency of sampling; ensure monitoring data are representative and reliable).

We tested requirements documented in the *Monitoring Plan - Annual Drinking Water Quality Plan 2019-20.* A requirement for 12 monthly *E. coli* samples for the Nepean system; is consistent with that reported in the 13 samples tested as reported in the *Quarterly drinking water report* (April to June 2020). The frequency testing requirements for manganese and aluminium were also consistent for that undertaken for the Nepean system.

Consumer satisfaction

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (establish a consumer complaint and response program, including appropriate training of employees).

A sample health complaint made for Nepean (11/2/2020) was viewed in the CRM (*Interaction System*) and tested against the *Managing Water Quality Complaints Procedure* (dated 17/09/2019). The customer reporting feeling ill; actions undertaken in the response to the complaint were recorded in the CRM system. The procedure requires that the customer is asked if they may refer their details to NSW Health – a record was made that the customer declined to send their complaint details to NSW Health. The record was consistent with the procedure. Refer to Element 7, Employee Training for records of training relating to consumer satisfaction.

Short-term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (establish procedures for the daily review of drinking water quality monitoring data and consumer satisfaction; develop reporting mechanisms internally, and externally, where required).

The Labware software generates daily data notification and reports to staff for specific systems. Evidence was provided of email correspondence with results data for Di-Chloramine (dated 19/12/2019)

Evidence of external reporting of monitoring data and consumer satisfactions was provided:

- JOG Meeting minutes (19/9/2019, 11/11/19, 6/03/2020, 18/05/2020)
- Quarterly Drinking Water Quality Monitoring Report for NSW Health (1 April 2020 to 30 June 2020)
- Annual Drinking Water Quality Compliant and Performance Report, 2019-20

Corrective action

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (establish and document procedures for corrective action in response to non-conformance or consumer feedback; establish rapid communication systems to deal with unexpected events).

Evidence was provided of the management of an incident for the *E. coli* detected in the Nepean system in March 2020 as part of the routine verification testing program. The incident was viewed in SWIRL and investigative report provided. Actions taken included resampling; reservoir inspection; water quality checked at compliance sites and any other nearby reservoirs. Investigations report completed and logged in SWIRL as an

incident. The incident was reported at the JOG meeting on the 18 May 2020; meeting minutes were provided as evidence.

Element 6 Management of incidents and emergencies-

Communication

Sydney Water has defined communication protocols with the involvement of relevant agencies, prepared a contact list of key people, agencies and businesses, and developed a public and media communications strategy,

Sydney Water demonstrated they had followed their communication protocols including notifying NSW Health as required.

From the reporting data, we selected a low fluoride incident and viewed the SWIRL record (13/2/20). The recorded noted that NSW Health was notified.

Refer to discussion on evidence of notification to NSW Health in Preventative Measures and Multiple Barriers and Element 4, Corrective Actions and Element 3.

Incident and emergency response protocols

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (Define potential incidents and emergencies and document procedures and response plans with the involvement of relevant agencies; train employees and regularly test emergency response plans; investigate any incidents or emergencies and revise protocols as necessary).

Records in SWIRL were viewed as part of the audit interviews. Evidence was provided of a proactive approach to incidents reporting, with hazards as well as incidents and emergencies being recorded.

Refer to details of the records of management of incident in Element 4, Corrective Actions and Element 5, Corrective Actions.

Element 7 Employee awareness and training

Employee awareness and involvement

Sydney Water demonstrated they have met the requirements for implementation with the ADWG to develop mechanisms and communication procedures to increase employees' awareness of and participation in drinking water quality management.

Sydney Water delivered Water Quality awareness training to staff involved in the supply of drinking water to customers. The Compass training records show that 85 staff were trained in drinking water quality awareness, across the following roles:

- Commercial Client Representative
- Contract Officer
- Customer Advocate
- Customer Water Quality Manager
- Environmental Specialist

Clause 4.1 – Drinking water

- Field Sampling Team Leader
- Lab Manager
- Lab Supervisor
- Network Operator
- Network Technician
- Networks Team Leader
- Operational Planner
- Planner
- Program Coordination Team Leader
- Program Coordinator
- Project Leader
- Regulatory Liaison Officer
- Water Quality Analyst

Employee training

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (ensure that employees, including contractors, maintain the appropriate experience and qualifications; identify training needs and ensure resources are available to support training programs; document training and maintain records of all employee training apart from minor shortcomings associated with training records.

During the interview we viewed the Compass program where training records are kept. The Manager demonstrating the program was able to see this team records. We selected a production officer from the Nepean WFP and viewed their records from 1/7/19 - 30/6/20. Training for confined space training and bushfire awareness training were recorded. A training record was provided as evidence for a Water Quality Scientist (Dated 15/07/2020) for training completed in the audit period.

During this audit period Sydney Water completed the training of production officers and relevant operational staff at Nepean WFP for the critical instruments SOP for water quality monitoring. Sydney Water also completed the operators training for chemicals delivery procedures and quality assurance for Nepean WFP. The records for both these training sessions were paper-based and held locally.

Evidence of training was provided for the Nepean Process Specification, undertaken on the 23/03/2020. Sydney Water advised that operators were trained in the standard operating procedure for the temporary chloring dosing unit, but that no records were kept.

Element 10 Documentation and reporting

Management of documentation and records

Sydney Water demonstrated implementation of the ADWG requirements to:

- ensure current versions of drinking water quality management documentation are in use through their BMIS and supporting review processes.
- establish a records management system and ensure that employees are trained to fill out records. We viewed the records associated with the different systems that Sydney Water uses including SWIRL, MAXIMO and Compass as well as paper records associated with their quality management system. Specific observations are discussed throughout the report.

Reporting

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements of this component (establish procedures for effective internal and external reporting; produce an annual report to be made available to consumers, regulatory authorities and stakeholders).

We have seen sufficient evidence that Sydney Water produced the reports required under their DWQMS and the IPART Reporting Manual. Not all of the requirements of the Reporting Manual were addressed in the Drinking Water Annual Compliance Report. These deficiencies are graded at Clause 10.2.

Element 11 Evaluation and audit

Long-term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate implementation with the ADWG requirements to collect and evaluate long-term data to assess performance and identify problems and document and report results.

The Nepean WFP System Performance Summary 2018/19 is strong evidence that Sydney Water meets this obligation. The report was prepared in April 2020 ahead of the annual operational risk review (KnowRisk Register June 2020). The Report charted the last 5 years of key raw water data including true colour, turbidity, dissolved organic carbon, Total organic carbon and total manganese. The last 5 years of treated water was charted for pH, free chlorine, monochloramine trihalomethanes, *E. coli*, fluoride, true colour, turbidity, aluminium total manganese and total iron.

Audit of drinking water quality management

Sydney Water conducted two of the three independent audits scheduled in the audit period (Cascade WFP on 4th October 2019 and Prospect WFP scheduled for January and conducted on 4th February). A third audit, of North Richmond WFP, was included in the Systems Assurance Audit Plan for 19/20 but was not undertaken due to COVID-19 restrictions. Both the Cascade and Prospect WFP audit assessed the implementation of the ADWG Framework elements 2-6 and 12. We sighted the reports to the JOG for these two audits reporting improvement opportunities and observations.

Element 12 Review and continual improvement

Review by senior executive

The Management Systems presentation from the 14 November 2019 was provided as evidence that the senior executive has reviewed the effectiveness of the managed system and evaluated the need for change. This presentation reported performance against the CCPs and OCPs. Key improvements were presented including the corporate water quality improvement plan and its dashboard reporting and new hazard reporting. The presentation also included slides illustrating the progress on the drinking water improvement plan. The Customer Delivery Performance Dashboard Report for June 2020 was also provided as evidence. This reported on operating licence compliance with drinking water quality meeting ADWG guidelines which we consider a lagging indicator of the DWQMS effectiveness.

The attendees at the management meeting included General Managers, Heads of Department (including Risk) and relevant managers, which meets the ADWG requirements for the senior executive review.

Drinking water quality management improvement plan

Sydney Water has provided sufficient evidence to demonstrate they had implemented the ADWG requirements to develop a drinking water quality management improvement plan; ensure that the plan is communicated and implemented, and that improvements are monitored for effectiveness, apart from a shortcoming identified with the timings of actions being entered into appropriate registers following the risk assessment process discussed under Element 3 Preventative Measures and Multiple Barriers.

The development of the Drinking Water Dashboard (as part of the improvement plan) in the improvement plan is strong evidence that Sydney Water implements and communicates its improvements. Sydney Water provided evidence that plan was presented to NSW Health during the quarterly JOG meetings.

Sydney Water closed off 15 items on the improvement plan in 2019/20 and added two.

Refer to discussion on improvement plan items identified during the risk assessment under Element 3 Preventative Measures and Multiple Barriers.

Recommendation

Recommendation 4.1.3-1: By 30 June 2021, establish processes for identifying and actioning improvement items identified in risk assessments to ensure timely resolution and update the Product Management Improvement Framework.

Recommendation 4.1.1-1 also applies to this clause.

Opportunities for improvement

OFI 4.1.3-1: Review process for changing SCADA names to prevent deletion of local data available for operators to view

OFI 4.1.3-2: Review the records management process for operational water quality training to ensure records of this training are kept.

Clause 4.2 – Recycled Water

We commend Sydney Water on the continuous improvement in the maintenance and implementation of their Recycled Water Quality Management System (RWQMS). We found the operations staff to have a strong understanding of their obligations to management recycled water safely. At the reporting level we observed that reporting remains focussed on verification reporting and compliance rather than the reporting on the effectiveness of the controls (CCP reporting).

Clause 4.2.1

Subclause	Requirement		Compliance grade
4.2.1	Sydney Water must maintain a Management System that is consistent with the Australian Guidelines for Water Recycling and any requirements relating to water recycling specified by NSW Health (the Recycled Water Quality Management System).Compliant (minor shortcomings)		
Risk		Target for full compliance	
The risk posed to public health and the environment from non- compliance with this clause could be significant.		Systems and processes in place to identify the requirements of the Australian Guidelines for Water Recycling in Sydney Water's context, a system, document or other which meets the intent of a Recycled Water Quality Management System and evidence to show how these requirements have been maintained	

Summary of reasons for grade

Sydney Water has demonstrated that it is has a fully implemented RWQMS, apart from shortcomings in the following areas:

- gaps in documentation on the annual operational review process
- inconsistencies in currency of risk procedure documentation
- lack of documentation on the basis of the low chlorine contact tank (CCT) flow critical control point for West Camden WRP
- gaps in referencing appropriate site-specific documents in the scheme recycled water quality managements plans. For example, for West Camden, the *West Camden WRP Incident Response Manual*, chemical delivery plan and relevant monitoring documentation are not referenced in the Camden RWQP and do not reference site-specific audits or internal reviews.
- No evidence provided for the basis for the scheduling of internal recycled water quality management plan audits
- The *Product Management Improvement Framework* focussed on Drinking Water and was missing explicit references to recycled water.

We have seen sufficient evidence to confirm that the requirements have been met apart from shortcomings identified, which to date has not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes. This clause is graded Compliant (minor shortcomings).

Discussion and notes

Sydney Water manages its recycled water through a hierarchy of documents supported by its integrated management system. The Recycled Water Management Manual is a roadmap for their recycled water management system and provides the overall corporate management framework relevant to Sydney Water's operational recycled water schemes. The Recycled Water Management Manual is structured according to the elements, components, and actions set out in the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) (AGWR) 'Framework for management of recycled water quality and use' (AGWR Framework). The Recycled Water Management Manual is supported by scheme specific recycled water quality management plans. During the audit, we focussed on documentation for Camden West WRP; with the Recycled Water Quality Management plan for West Camden (WQ0006) provided as evidence.

In considering the 'maintain' requirement of this clause, we have audited the water quality management system against the requirements of the AGWR Framework. The audit scope was for Elements 2 – 7 and 10 – 12 of the Framework.

Element 2 Assessment of the recycled water supply system

Intended uses and source of recycled water

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (identify source of water; identify intended uses, routes of exposure, receiving environments, endpoints and effects; consider inadvertent or unauthorised uses).

The Recycled Water Management Manual states that these requirements are addressed through Scheme Plans. Source water, intended uses, receiving environments, inadvertent or unauthorised used and scheme target are adequality documented in the West Camden in the Recycled Water Quality Management plan for West Camden (WQ0006). The document was last updated in June 2019; during the site visit it was confirmed that end users as documented were current.

Recycled water system analysis

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (assemble pertinent information and document key characteristics of the recycled water system to be considered; assemble a team with appropriate knowledge and expertise; construct a flow diagram of the recycled water system from the source to the application or receiving environments; periodically review the recycled water system analysis).

Recycled water supply system analyses are reviewed prior to detailed recycled water quality risk reviews. The makeup of assessment team and the data required for analysis

is described in the *Recycled Water Risk Assessment Workshop SOP* (D0001681, v1, 16/3/2020).

Sydney Water have a process in place for the development of process flow diagrams, *Work Instruction for Creation of Process Flow Diagrams* (D0000685; dated 18/06/2018). This document is current and comprehensive. A flow diagram was provided for the West Camden WRP (778440; 22 June 2019) as evidence of this process being maintained and was found to be consistent with the requirements of the work instruction.

Assessment of water quality data

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (assemble historical data about sewage, greywater or stormwater quality, as well as data from treatment plants and of recycled water supplied to users; identify gaps and assess reliability of data; assess data (using tools such as control charts and trends analysis), to identify trends and potential problems).

Sydney Water has a process in place for assembling and assessing historical water quality data for detailed risk reviews (D0001681) with information compiled in the risk assessments briefing and output reports. The requirements for data analysis included in the SOP are appropriate.

Hazard identification and risk assessment

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (define the approach to hazard identification and risk assessment, considering both public and ecological health; periodically review and update the hazard identification and risk assessment to incorporate any changes; identify and document hazards and hazardous events for each component of the recycled water system; estimate the level of risk for each identified hazard or hazardous event; consider inadvertent and unauthorised use or discharge; determine significant risks and document priorities for risk management; evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty) apart from minor shortcomings identified with inconsistencies across risk documentation.

Requirements for risk assessments are detailed in the *Recycled Water Risk Assessment Workshop SOP* (D0001681). The risk assessment SOP states (Section 2.0 Scope) that the procedure for WRP annual risk reviews is not covered under this document. No evidence was provided where the process for annual reviews is documented. Sydney Water has a *Recycled Water Hazard and Risk Library* (D0001682) of risks to be considered as part of the risk assessment process.

The issues around the risk matrix noted in clause 4.1.1 also relate to this clause. Sydney Water reported (Annual Compliance report) one significant change to the Recycled Water Management System in the audit period, which was a change to the public Health risk consequence descriptors in the *Corporate Risk Matrix* (800991; dated 1/07/2019).

Discrepancies in risk documentation were identified as a minor shortcoming. The Risk Management Procedure (1045159, v1, dated 16/03/2020) states in the document

control that it supersedes the document *QMAF0081 Guide A: Risk Assessment* (dated 06/08/2018). The Recycled Water Risk Assessment Workshop SOP (D0001681), dated 16/3/2020) references QMAF0081. Risk assessment documentation (*Risk Assessment Report Wollongong Stage 1 Recycled Water Scheme, June* 2020) which used the current risk matrix (800991; dated 1/07/2019) refers to the superseded QMAF0081 document. Sydney Water advised in the interviews the current risk matrix (800991; dated 1/07/2019) is being used for recycled water risk assessments.

Element 3 Preventive measures for recycled water management

Preventive measures and multiple barriers

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Identify existing preventive measures systemwide for each significant hazard or hazardous event, and estimate the residual risk; identify alternative or additional preventive measures that are required to ensure risks are reduced to acceptable levels; document the preventive measures and strategies, addressing each significant risk).

Preventative measures are documented in scheme specific management plan and reviewed in the risk assessments. Section 3.1 of the *Recycled Water Quality Management plan for West Camden* (WQ0006) documents treatment and end user controls for the scheme.

Additional measures are identified during the risk assessment workshops and documented in the risk assessment output documentation. Actions are entered into the improvement plan or interface register. Subject matter experts are used to determine which actions are entered into which system.

Critical control points

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (assess preventive measures throughout the recycled water system to identify critical control points; establish mechanisms for operational control; document the critical control points, critical limits and target criteria), apart from a shortcoming in the documentation on the basis of the low flow critical control point for West Camden WRP.

The *Recycled Water Product Specifications* (D000096) identifies key preventative measures including critical control points, operational control points, their limits and target performance levels. The basis for critical control points is documented in the specification; with the exception of low CCT flow as a critical control point at West Camden WRP.

The critical control points in the recycled water specification were consistent with those in the West Camden in the Recycled Water Quality Management plan for West Camden (WQ0006).

Element 4 Operational procedures and process control

Operational procedures

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Identify procedures required for all processes and activities applied within the whole recycled water system (source to use); document all procedures and compile into an operations manual).

Operational procedures are documented in BMIS. A sample of documents, their version control details, dates and required review dates were sighted in the database. All documents viewed were current; with no documents marked as expired.

The West Camden WRP – Plant Operations Manual (D0001287, v2) was provided as evidence. The protocols for interfaces between wastewater network and the WRP are documented in Operational Interface protocols. The West Camden Sewerage Catchment Operational Interface protocol (OIP), Hydraulics (WWNW001, v4, 20/08/18) was provided as evidence and currency.

Operational monitoring

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (develop monitoring protocols for operational performance of the recycled water supply system, including the selection of operational parameters and criteria, and the routine analysis of results; document monitoring protocols into an operational monitoring plan) apart from a shortcoming associated with appropriate referencing in the site-specific recycled water quality plan.

Recycled Water Management Manual states that the scheme plans include and monitoring plan. Monitoring protocols for are documented in the *Monitoring Plan – Wastewater Treatment Plant: Compliance and Operational 2018-2020* (773507, 3/7/2018); this document is current for the audit period. The plan covers effluent quality and process monitoring requirements. Process monitoring requirements are included in Appendix 7.

The Camden Wollondilly Hub Sampling and Analysis, Integrate Management System (D0001344.03, v2, date, February 2020) includes the laboratory schedule and sampling locations for West Camden WRP. The West Camden Water Recycling Plant, Liquid Stream Readings Plant Monitoring Workflow, Work Instruction (DOC0154, v3 25/5/2017) documents the process to inspect and monitor the designated liquid stream readings plant equipment. A shortcoming is identified that while monitoring schedules are included in these documents; references to these schedules are not included to in the Camden Recycled Water Quality Management plan.

The *West Camden WRP Process Specification* (D0001178) details monitoring target criteria and limits for each process unit.

Operational corrections

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (establish and document procedures for corrective

action where operational parameters are not met; establish rapid communication systems to deal with unexpected events).

The Recycled Water Management Manual states that WRPs have Unit Process Guidelines (UPG) for troubleshooting and corrective action guides. A UPG for Biological Nutrient Removal (TO0021, v3) was provided as evidence.

The Recycled Water Quality Event Management Plan, Integrated Management System (WR5271, v12, dated 1/6/2020) is the overarching process for corrective actions of nonconformances. The West Camden WRP Incident Response Manual, Integrated Management System (D0001222.10, v4, v8, 22/8/2019) documents the process for incidents specifically. A shortcoming is noted that references to the scheme specific incident management plan is not include in the Camden Recycled Water Quality Management plan under this component, only the overarching plan.

The *Camden Recycled Water Quality Management plan* documents corrective actions for critical and operational limit exceedances.

Equipment capability and maintenance

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Ensure that equipment performs adequately and provides sufficient flexibility and process control; establish a program for regular inspection and maintenance of all equipment, including monitoring equipment).

Schedules for calibrations are accessed through BMIS. The *Camden Wollondilly Hub* – *Online Instrument Calibration SOP, Integrated Management System* (D0001768) provides instructions and schedules for inspections, cleaning and calibration of field for the Camden Wollondilly Hub plants. Schedules are included for pH, chlorine, ORP, turbidity and dissolved oxygen instruments. Inspection and maintenance requirements are included in the *West Camden WRP – Plant Operations Manual* (D0001287, v2) which was provided as evidence.

Materials and chemicals

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Ensure that only approved materials and chemicals are used; establish documented procedures for evaluating chemicals, materials and suppliers).

Approved treatment chemicals are covered under Sydney Water chemical specification documentation and supply contracts. A specification chemical specification was viewed for Sodium Hypochlorite.

The *West Camden WRP Bulk Chemical Delivery* (D0001375) details the work instruction for receiving and unloading of bulk chemicals, including chemical varication analysis required. While the Recycled Water Management Manual states there are procedures for delivery of chemicals, a shortcoming is noted that references to the site-specific bulk chemical delivery plan is not referenced in the *Camden Recycled Water Quality Management plan*.

Element 5 Verification of recycled water quality and environmental performance

Recycled water quality monitoring

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Determine the characteristics to be monitored; determine the points at which monitoring will be undertaken; determine the frequency of monitoring), apart from a minor inconsistency in the Recycled Water Management Manual.

A minor inconsistency is noted in the Recycled Water Management Manual that states that scheme monitoring plans form the input for the Annual Recycled Water Quality Monitoring Plan; contrary to the monitoring plans provided covering a 2-year period (2019-2021).

Monitoring protocols for verification system performance are documented into a Monitoring Plan. The *Monitoring Plan – Recycled Water Quality: Compliance & Operational 2019-2021* (BMIS0045) was provided as evidence of documentation of verification monitoring requirements. Monitoring schedules for West Camden WRP irrigation is included in Appendix 5 Table 9, consistent with that included in *West Camden Recycled Water Quality Management Plan* Appendix D.

Application site and receiving environment monitoring

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (determine the characteristics to be monitored and the points at which monitoring will be undertaken).

Verification monitoring at receiving environments is described above in Recycled Water Monitoring. The Recycled Water Management Manual states that responsibility for end use monitoring is dependent on the end use. The *West Camden Recycled Water Quality Management Plan* states that the scheme end users are responsible for the environmental discharge and monitoring on their site.

Documentation and reliability

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (establish and document a sampling plan for each characteristic, including the location and frequency of sampling, ensuring that monitoring data is representative and reliable) as discussed under Element 5, Recycled Water Monitoring section above.

Satisfaction of users of recycled water

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (establish an inquiry and response program for users of recycled water, including appropriate training of people responsible for the program).

The *Managing Water Quality Complaints Procedure* (dated 17/09/2019) documents the process for managing customer complaints for both drinking and recycled water. Water

quality complaints from an area with a Recycled Water Supply Scheme area are attended as a higher priority. The Area Water Quality Scientists are responsible for responding to and managing the water quality complaints. The process for training for water quality scientist is documented in the *Development Program for Water Quality Scientist Procedure* (D0001673). The CRM system was viewed with the option to select 'Recycled water – dirty water' as an option.

For the West Camden scheme, the Business Customer Representative is provided as the contact for end user. Regular six-monthly meetings scheduled.

Short-term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Establish procedures for the short-term review of monitoring data and satisfaction of users of recycled water; develop reporting mechanisms internally and externally, where required).

The process to review recycled water verification data is documented in the scheme specific recycled water quality management plans. The process to review consumer satisfaction is documented in the *Managing Water Quality Complaints Procedure* (dated 17/09/2019).

Mechanisms of external reporting are documented in the Drinking Water Quality Event Management SOP (WPIMS5228) and the *Annual Reporting to EPA and IPART by MD&R* (DOC0327). External reporting is undertaken through quarterly reports to irrigation and industrial end users and NSW Health. Other mechanisms include provision of data through the JOG meetings.

Corrective responses

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (establish and document procedures for corrective responses to nonconformance or feedback from users of recycled water; establish rapid communication systems to deal with unexpected events) apart from a shortcoming noted in referencing appropriate documents in the scheme specific management plans.

The Recycled Water Quality Event Management Plan, Integrated Management System (WR5271, v12, dated 1/6/2020) is the overarching the general process for corrective actions of non-conformances. The West Camden WRP Incident Response Manual, Integrated Management System (D0001222.10, v4, v8, 22/8/2019) documents the process for incidents specific to West Camden. As discussed in Element 4, a shortcoming is noted that references to the scheme specific incident management plan is not included in the Camden Recycled Water Quality Management plan under this component, only the overarching plan.

The Notification of Plant Recycled Water Production Interruptions, Integrated Management *System* (WRHQ5050, v6, dated 11/05/2020) describes the process for notification of plant interruptions.

Element 6 Management of incidents and emergencies

Communication

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Define communication protocols with the involvement of relevant agencies and prepare a contact list of key people, agencies and stakeholders; develop a public and media communications strategy).

Recycled Water non-conformances are communicated according to the procedure in the *Recycled Water Quality Event Management Plan* (WR5271). Figure 1 includes a flowchart of the incident escalation and notification process. The document covers scheme specific events and lists the actions or response for the event by the responsible officer.

The document *Notification of Plant Recycled Water Production Interruptions* describes the communication and notification process to the recycled water customer. The *Water Quality Management Contacts List* provides the detail contact list for all schemes and Sydney Water Internal and External agencies.

Incident and emergency response protocols

Sydney Water demonstrated it has met the AGWR requirements to define potential incidents and emergencies and document procedures and response plans with the involvement of relevant agencies; train employees and regularly test emergency response plans and investigate any incidents or emergencies and revise protocols as necessary.

Recycled Water Quality Event Management Plan (WR5271) documents potential incidents and procedures at the plants and the network including:

- Short term outage of key water treatment processes or equipment
- Failure of key water treatment processes or equipment
- Inadequate disinfection levels (in the network)
- Customer complaints/third party allegation
- Cross connection/backflow
- High risk broken mains
- Other recycled water quality results in the network
- Security breaches
- Threats/sabotage
- Natural events
- Effluent quality
- Inappropriate or un-authorised use of recycled water.

Element 7 Operator, contractor and end user awareness and training

Operator, contractor and end user awareness and involvement

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (develop mechanisms and communication procedures to increase operator, contractor and end user awareness of, and participation in, recycled water quality management and environmental protection).

Sydney Water states in the Recycled Water Management Manual that they achieve awareness through induction programs, newsletters, noticeboards, seminars, team briefings, divisional updates, meetings, internal forums, forums with key stakeholders, Sydney Water's intranet, internal social media, email, and road shows.

Training packages for the site-specific recycled water quality management plans are developed for individual schemes. Evidence of a presentation for West Camden was provided as evidence of maintenance (1277187 Training package – West Camden RWQMP training package.pptx).

Awareness and involvement of the recycled water management system for end users is managed through the Business Customer Representatives through meetings held with the end users; 'Customer recycled water awareness' included as an agenda item on the *Recycled Water Customer Meeting Form*.

Operator, contractor and end user training

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to ensure that operators, contractors and end users maintain the appropriate experience and qualifications identify training needs and ensure resources are available to support training programs and document training and maintain records of all training sessions.

Staff position descriptions document required staff skills, qualification and experience. A number of position descriptions were provided of evidence (Senior Production Officer, Business Customer Representative, Process Manager).

Sydney Water have developed the *Production Capability Framework, Technical Capability Training Program FAQ (December 2019).* This is seen as an exemplar process for identifying gaps and assessing capabilities of staff seeking career progression. An example template document for staff and managers to document progression of gaps identified in the process (*Production Capability Development Guide – Product Quality*) for career development staff working to progress down a different path.

The *Contribution and Development Planning and Review Policy* (734434) documents the requirement for employees to have a Contribution and Development Plan and that Compass is used to document records for this process.

Training records are maintained in Compass for formal training, training co-ordinated across Sydney Water or training scheduled through Compass. Local training records (e.g. for local SOPs) are held locally. Compass has recently expanded its functionality to be able to incorporate the local training records. We have noted an improvement

opportunity for Sydney Water to centralise training records associated with the production of safe drinking and recycled water.

Element 10 Documentation and reporting

Management of documentation and records

Sydney Water uses the same systems for the management of records as discussed under Element 10 of Clause 4.1.1.

Reporting

As required by the AGWR, Sydney Water has established procedures for internal and external reporting including the preparation of an annual report for regulatory authorities. Sydney Water have not fully established the procedures and process required to meet the requirements of the Recycled Water Management Manual (BMIS0260) as detailed in Table 10-1 that documents the required compliance reporting. This shortcoming is discussed in Clause 10.2.

Sydney Water does not document the production of an annual (recycled water) report for end users. They do produce quarterly irrigation water quality reports provided to end users. As they are reporting more frequently than annual, we consider this requirement met.

Element 11 Evaluation and audit

Long-term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (collect and evaluate long-term data to assess performance and identify problems; document and report results) apart from shortcomings identified under Clause 10.2.

Sydney Water has procedures and processes to conduct long-term analysis of recycled water quality. The *Preparation of Recycled Water Quarterly Reports* requires a statistical analysis of 12-month rolling window of data.

Long-term water quality data is also analysed during the scheme risk assessment. The statistical analysis of water quality data (10 years) is trended and checked against AGWR microbiological, LTV and STV values. This analysis is presented in scheme risk assessment reports to inform the stakeholders and included in the final risk assessment report as required under the *Recycled Water Risk Assessment Workshop SOP* (D0001681).

Sydney Water has not documented how the long-term analysis of critical control points performance is undertaken. Recommendations are made for this under Clause 10.2.

Audit of recycled water quality management

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish processes for internal and external audits and document and

communicate audit results apart from minor shortcomings associated with the limited internal audits undertaken.

The Assurance and Monitoring (Audit and Inspections) process (SDIMS0010) outlines the process for an effective audit and inspection program for process performance monitoring and risk management. The requirements for audit of the RQWMS could not be established from the Recycled Water Management Manual. The Recycled Water Quality Management Plan West Camden also did not establish the requirements.

From the evidence provided, it appears that one audit was scheduled in the 2019/20 year to review the implementation of a scheme's recycled water quality management plan. Additional audits were schedules for two other WRP to *"To assess the effectiveness of the environmental and integrated management system requirements against the relevant Standards, legislative and business requirements."*

Processes are established through BMIS to track the audit results. In the interviews we also established that findings from an audit at one plant are transferred to all plants if the findings are not site-specific issues.

We consider the limited auditing (or documentation of audits) focussed on recycled water management) a minor shortcoming as no basis for audit scheduling in the evidence was provided. Review of the 19/20 audit schedule showed only one WRP RWQMP was internally audited. During the interviews Sydney Water stated they have identified that every Hub should be "touched" by an audit every three years and that every AGWR element should be audited every year. Findings from these audits should be applied across all the plants. We support this improved auditing approach.

The RWQMS is also subject to the operational licence audit (this report).

Element 12 Review and continuous improvement

Reviewed by senior managers

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements under this component (Senior managers review the effectiveness of the management system and evaluate the need for change).

Recycled water quality management improvement plan

Sydney Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to develop a recycled water quality management improvement plan and ensure the plan is communicated and implemented, and that improvements are monitored for effectiveness apart from a shortcoming associated with lack of explicit reference to recycled water in the *Product Management Improvement Framework*

Sydney Water's Recycled Water Improvement Plan is comprised of two items:

- the *Product Management Improvement Framework* (BMIS0214), which describes the approach used to identify the improvement programs and initiatives
- the *Product Management Improvement Register* and dashboard, which records the improvement actions and initiatives.

We found that the *Product Management Improvement Framework* is focussed on Drinking Water. This document should be reviewed and expanded to explicitly reference recycled water. Sydney Water acknowledged in the interviews that this document was high level and that it needed to document the processes to be followed in maintaining the improvement plan.

The *Product Management Improvement Register* had been maintained, with progress recorded against relevant actions for the quarter 4, 1 and 2 JOG updates.

Sydney Water had processes to communicate and implement the plan including presenting the plan to NSW Health during the quarterly JOG meetings.

Actions from the recycled water risk assessment are transferred either to the Hub Action List or the Recycled Water Improvement Plan Register depending upon their significance. Risk associated with CCPs and interlocks are transferred to the Recycled Water Improvement Plan Register. If actions apply to multiple plants, these are also carried into the improvement plan. We requested and were provided with the Georges River Hub Master Action List. This demonstrates the maintenance of the systems associated with the improvement plan. Sydney Water has a continuous improvement approach to improving the transfer and tracking of recycled water improvement actions from the risk assessments.

Recommendation

Recommendation 4.2.1-1: By 30 June 2021, document the procedure for undertaking the recycled annual operational risk assessment reviews.

Recommendation 4.2.1-2: By 31 March 2021, ensure risk assessment documentation (including workshop reports and the operational risk assessment procedure) refer to the current Risk Management Procedure and Risk Matrix.

Recommendation 4.2.1-3: By 30 September 2021, update critical control point documentation for Camden West WRP to document the basis for the CCT low flow critical control point

Recommendation 4.2.1-4: By 31 December 2021, update scheme specific recycled water quality management plans that are scheduled for review in this period to include reference to scheme specific documentation, including West Camden Recycled Water Quality Management Plan. Include an action in the Recycled Water Improvement Register to update all scheme specific plans with this information at their scheduled review.

Recommendation 4.2.1-5: By 31 December 2021, update the recycled water audit schedule to ensure a yearly review of high risk AGWR elements at a number of recycled water schemes each year (as agreed with NSW Health). The schedule should be risk-based and consider locations and exposures. All recycled water schemes should be audited within a 3-year cycle.

Recommendation 4.2.1-6: By 30 June 2021, review and update the *Product Management Improvement Framework* to explicitly reference recycled water. Establish processes for identifying and undertaking action items in risk assessment to ensure timely resolution and update the Product Management Improvement Framework.
Opportunities for improvement

OFI 4.2.1-1: Bring the practice of developing an annual system performance (undertaken at for water filtration plants) to recycling plants prior to the annual risk assessment review

OFI 4.2.1-2: Update the Recycled Water Management Manual to clarify discrepancies in in where training records are stored, either locally at water recycling plants or in Compass.

OFI 4.2.1-3: Specify in the Recycled Water Management Manual how the obligations under Performance Standards for Water Quality in the IPART Reporting Manual Requirement are met.

OFI 4.2.1-4: Centralise local training records associated with the production of safe drinking and recycled water in Compass.

Clause 4.2.3

Subclause	Requirement		Compliance grade
4.2.3	Sydney Water must ensure that the Recycled Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Recycled Water Quality Management System and to the satisfaction of NSW Health.		Compliant (minor shortcomings)
Risk T		Target for full compliance	
If the Recycled Water Quality Management System is not fully implemented, there is a high risk that Sydney Water may not be able to effectively manage the risk to public health and the environment.		Evidence that the Recycled Water Quality M is fully implemented and that all relevant ac out in accordance with the Recycled Water System. Evidence to show that NSW Health Recycled Water Quality Management System implementation.	lanagement System ctivities are carried Quality Management is satisfied with the m and its

Summary of reasons for grade

Sydney Water has demonstrated that it is has a fully implemented Recycled Water Quality Management System, apart from shortcomings in the following areas:

- SCADA critical limit for low flow CCT at West Camden WRP was set incorrectly
- Range of permissions to change the flow CCT critical control points and the bypass flow critical limit were set inconsistent with the critical limits
- Errors in verification monitoring reporting

We have seen sufficient evidence to confirm that the requirements have been met apart from shortcomings identified, which to date has not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.

This clause is graded Compliant (minor shortcomings).

Discussion and notes

Evidence was provided of engagement between Sydney Water and NSW Health (email correspondence from NSW Health dated 14/11/19), that NSW Health indicated satisfaction with implementation of the recycled water management systems would require that Sydney Water:

- *Regularly update the Joint Operational Group (JOG) on implementation of the management system and action on the improvement register*
- Demonstrate a record of consultation with NSW Health prior to the JOG
- Consult NSW Health on significant changes proposed to the management system
- Allow adequate time for consultation with NSW Health and incorporation of feedback prior to significant changes
- Implement a system of internal review of the management system with NSW Health involvement

Evidence was provided of JOG meeting minutes, email correspondences, Recycled Water Quality Annual Compliance Report and Quarterly Reports to NSW Health as evidence of satisfaction.

Element 2 Assessment of the recycled water supply system

Intended uses and source of recycled water

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (identify source of water; identify intended uses, routes of exposure, receiving environments, endpoints and effects; consider inadvertent or unauthorised uses).

Review of intended uses and sources of recycled water is undertaken as part of the risk assessment review process. Section 2.1 of the *Risk Assessment Report Liverpool RWQMP* (December 2019) was provided of evidence of this review. While outside the scope of the audit period, an updated *Recycled Water Quality Management Plan Liverpool WRP* (WQ003, v4, dated 17/7/2020) was provided showing ongoing implementation of this requirement.

Recycled water system analysis

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (assemble pertinent information and document key characteristics of the recycled water system to be considered; assemble a team with appropriate knowledge and expertise; construct a flow diagram of the recycled water system from the source to the application or receiving environments; periodically review the recycled water system analysis).

Detailed risk assessments are carried out on a four-yearly basis. Sydney Water provided evidence for Liverpool WRP (*Risk Assessment Report Liverpool RWQMP*; December 2020), Wollongong WRP Stage 1 (*Risk Assessment Report Wollongong Stage 1 Recycled Water Scheme, June* 2020) and Stage 2 (*Risk Assessment Report Wollongong Stage 2 Recycled Water Scheme, June* 2020). The risk documentation provided was consistent with *Recycled Water Risk Assessment Workshop SOP* (D0001681). The accuracy of the West Camden WRP process flow diagram (778440; dated 22/6/2020;) was tested during the site visit. There was consistency with the processes viewed and the interview responses during the site visit against the process flow diagram.

Assessment of water quality data

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (assemble historical data about sewage, greywater or stormwater quality, as well as data from treatment plants and of recycled water supplied to users; identify gaps and assess reliability of data; assess data (using tools such as control charts and trends analysis), to identify trends and potential problems).

Assessment of historical data is undertaken as part of the detailed recycled water quality risk assessment reviews. Liverpool and Wollongong Stage 1 and Stage 2 risk assessments reports were provided as evidence. The reports included an analysis of 10 years of influent data and effluent data. A detailed sampling program was also undertaken of microbial indicators to test log reduction value performance.

Hazard identification and risk assessment

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (define the approach to hazard identification and risk assessment, considering both public and ecological health; periodically review and update the hazard identification and risk assessment to incorporate any changes identify and document hazards and hazardous events for each component of the recycled water system; estimate the level of risk for each identified hazard or hazardous event; consider inadvertent and unauthorised use or discharge; determine significant risks and document priorities for risk management; evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty).

Liverpool and Wollongong Stage 1 and Stage 2 risk assessments reports were provided as evidence of detailed risk assessments undertaken in the audit period. The methodology used was consistent with the *Recycled Water Risk Assessment Workshop SOP* (D0001681). Uncertainty was considered as part of these risk assessment and documented in the risk column 'Risk comment - certainty of control'. The current *Corporate Risk Matrix* (800991 and *Recycled Water Hazard and Risk Library* (D0001682) was used and referenced in the risk reports.

Evidence was provided of an annual operational risk review for West Camden WFP (West Camden KnowRisk spreadsheet).

Element 3 Preventive measures for recycled water management

Preventive measures and multiple barriers

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Identify existing preventive measures system-

wide for each significant hazard or hazardous event, and estimate the residual risk; identify alternative or additional preventive measures that are required to ensure risks are reduced to acceptable levels; document the preventive measures and strategies, addressing each significant risk).

Sample preventative measures documented in the West Camden in the Recycled Water *Quality Management plan for West Camden* (WQ0006) were tested on-site and found to be in place (treatment processes, maintenance of signage; critical control points).

Critical control points

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Assess preventive measures throughout the recycled water system to identify critical control points; establish mechanisms for operational control; document the critical control points, critical limits and target criteria) apart from shortcomings identified with setting of SCADA critical limits.

CCPs were tested through a demonstration of the SCADA systems, including cross checking that the SCADA critical limits were set consistent with CCP documentation and the range that these limits were able to be modified by Operators was limited by the critical limits Shortcomings with incorrectly set SCADA shutdown limits were identified. The low CCT flow shutdown limit was set at 45 L/s rather than the critical limit of 50 L/s; permissions to change this limit were set at 0 - 265 L/s; consistent with the upper but not lower critical limit. The Bypass flow critical limit was set at 84% consistent with the specification; however, permissions to change this were set at 0 - 265 L/s; were set at 0 - 100%; inconsistent with the critical limit. All other shutdown values and change permissions were set consistent with the critical limits in the specification.

Critical control point data (free chlorine residual, CCT turbidity; CCT flow) was viewed in SCADA for a sample period (January 2020). Exceptions against limits were noted on the 8 January, however no CCP exceedances occurred, with the exceptions occurring for less than 20 seconds or when water from the plant was not being supplied. It is noted that checking critical control point performance had to be undertaken by comparing analyser data to the plant flow data, to check that for any exceedances, water was not being supplied. An opportunity for improvement is noted to implement virtual tags, as used at the drinking water treatment plants, to enable improved review of critical control performance.

Element 4 Operational procedures and process control

Operational procedures

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Identify procedures required for all processes and activities applied within the whole recycled water system (source to use); document all procedures and compile into an operations manual).

The process units covered in the *West Camden WRP – Plant Operations Manual* (D0001287, v2) were consistent with those viewed during the site inspection. Evidence was provided of operations issues documented through process team meeting notes

(West Camden daily operations log, 24/11/2019). Training records were provided as evidence of implementation for West Camden WRP, *CWH Lab Schedule* training record sheet (30/01/220).

Operational monitoring

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Develop monitoring protocols for operational performance of the recycled water supply system, including the selection of operational parameters and criteria, and the routine analysis of results; document monitoring protocols into an operational monitoring plan).

Operational WRP monitoring is documented through daily inspection sheets, lab analysis records and SCADA records. We were provided as evidence, West Camden WRP liquid stream workshop log sheets and the Liquid Monthly Lab Sheet for November 2019 and viewed SCADA records during the site visit.

We tested the *Camden Wollondilly Hub Sampling and Analysis, Integrated Management System* (D0001344.03) against the November 2019 West Camden's Liquid Monthly Lab Sheet. The parameter, locations and frequencies undertaken are consistent with the schedule requirements.

Operational corrections

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (establish and document procedures for corrective action where operational parameters are not met; establish rapid communication systems to deal with unexpected events).

Sydney Water advised that there were no CCP exceedances in the audit period for West Camden. SCADA was viewed during the site visit and no exceedances were noted for the data sampled; refer to Element 3 critical control points for details. Evidence was provided of process meetings to discuss and record corrective actions (West Camden daily operations log, 24/11/2019).

Equipment capability and maintenance

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (ensure that equipment performs adequately and provides sufficient flexibility and process control; establish a program for regular inspection and maintenance of all equipment, including monitoring equipment).

Calibration records were provided for the West Camden WRP Hach Turbidity Meter, from 22/4/2020 to the 24/6/2020; generally consistent with the requirement for weekly verification and monthly calibration (D0001768).

During the site visit Sydney Water advised that the calibration schedule for West Camden WRP laboratory instruments is located locally. Sydney Water has added this as an improvement to be put into Maximo.

Materials and chemicals

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Ensure that only approved materials and chemicals are used; establish documented procedures for evaluating chemicals, materials and suppliers).

A certificate of analysis was provided for sodium hypochlorite, 11/5/2020; this was consistent with the requirement set in the technical specification for sodium hypochlorite (viewed during the interviews) and the analysis required in the *West Camden WRP Bulk Chemical Delivery* (D0001375).

Element 5 Verification of recycled water quality and environmental performance

Recycled water quality monitoring

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Determine the characteristics to be monitored; determine the points at which monitoring will be undertaken; determine the frequency of monitoring) apart from a shortcomings with errors in some monthly verification monitoring reports.

An *E. coli* detect was noted in the 'year to date' section of the May and June 2020 *West Camden Irrigation Scheme Monthly Reports* (July 2019 – June 2020), however the exception was not included on any of the monthly summaries provided. Sydney Water advised that the detect occurred in January 2020, that the analysis was undertaken manually and had not been picked up in the reporting until May 2020, this is considered a minor shortcoming. Evidence associated with the *E. coli* detect were viewed, including that a repeat sample was undertaken and *E. coli* less than 100 cfu/100 mL was detected; as there were less than two consecutive tests, the event was not notifiable. We acknowledge the Sydney Water provided evidence that they acted on this audit finding, updating the *Recycled Water Reporting Work Instruction* (MP0021). However, as this evidence is dated after the audit period and audit interviews, we have made a recommendation in line with the IPART audit guidelines.

An improvement to the reporting process is recommended on how *E. coli* detects are distinguished in the monthly reports from those that are notifiable to NSW Health under the *Recycled Water Quality Event Management Plan (WR5271)*.

It was also noted that verification testing is done on a scheduled basis, irrespective of whether water is being supplied to end user. The exception results are being reported without the supporting information as to whether recycled water was being supplied at the time. This can result in exceptions being reported for water that was not supplied.

Application site and receiving environment monitoring

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (determine the characteristics to be monitored and the points at which monitoring will be undertaken).

Quarterly irrigation water quality reports are provided to each customer. Evidence was provided of the *Irrigation Water Quarterly Report, Elizabeth Macarthur Agricultural Institute Supply Scheme (Fourth Quarter, 1/4/2020-30/6/2020.* Refer to the discussion under Recycled Water Quality Monitoring under this clause for issues noted in the irrigation reports.

A *Recycled water customer meeting form for Elizabeth Macarthur Agricultural Institute* (19 June 2020) was provided as evidence of the communication of responsibility of end user monitoring, with the item included as an agenda item.

Documentation and reliability

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (establish and document a sampling plan for each characteristic, including the location and frequency of sampling, ensuring that monitoring data is representative and reliable) apart from a shortcoming, as discussed under the Recycled Water Monitoring section above.

Satisfaction of users of recycled water

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (establish an inquiry and response program for users of recycled water, including appropriate training of people responsible for the program).

An example dirty water customer complaint was viewed in the CRM system for recycled water (6/5/2020); a MAXIMO work order to flush was recorded in the system. The records of the complaint were consistent with the Managing Water Quality Complaints Procedure (dated 17/09/2019). A training record was provided as evidence for a Water Quality Scientist (Dated 15/07/2020) for training completed in the audit period.

Short-term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (establish procedures for the short-term review of monitoring data and satisfaction of users of recycled water; develop reporting mechanisms internally and externally, where required).

An example daily exception report from EKAMS system was provided as evidence (21/05/2020) of internal reporting mechanisms. Evidence of external reporting of monitoring data and consumer satisfactions was provided:

- JOG Meeting minutes (19/9/2019, 11/11/19, 6/03/2020, 18/05/2020)
- *Quarterly Recycled Water Quality Monitoring Report for* NSW Health (1 October 2019 to 31 December 2019)
- Annual Recycled Water Quality Compliant and Performance Report, 2019-20

Corrective responses

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Establish and document procedures for

corrective responses to nonconformance or feedback from users of recycled water; establish rapid communication systems to deal with unexpected events). Refer to discussion above in Short-term evaluation of results.

Element 6 Management of incidents and emergencies

Communication

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Define communication protocols with the involvement of relevant agencies and prepare a contact list of key people, agencies and stakeholders; develop a public and media communications strategy).

Incident and emergency response protocols

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Define potential incidents and emergencies and document procedures and response plans with the involvement of relevant agencies; train employees and regularly test emergency response plans; investigate any incidents or emergencies and revise protocols as necessary).

During the interviews the management of incidents was tested. The initial response will be to minimise the impacts of the incident and escalate as appropriate. The operators and the hub manager each keep personal logs. Following the incident these are consolidated. Blank hardcopies are kept on-site and operators are encouraged to complete these as the incident progresses.

We discussed the aerator failure at West Camden and viewed the SWIRL record (INC-28126) for this incident. These discussions and demonstrations provided sound evidence that Sydney Water was implementing the RWQMS.

Element 7 Operator, contractor and end user awareness and training

Operator, contractor and end user awareness and involvement

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (develop mechanisms and communication procedures to increase operator, contractor and end user awareness of, and participation in, recycled water quality management and environmental protection).

A register of training undertaken for recycled water quality event management plans was provided as evidence of implementation (*Training Records - Compass - Recycled Water Quality Event Management Plan.xls*).

The *Recycled water customer meeting form for Elizabeth Macarthur Agricultural Institute* (19 June 220) was provided as evidence of end user awareness; an item 'Customer recycled water awareness' is included on the record.

Operator, contractor and end user training

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (ensure that operators, contractors and end users maintain the appropriate experience and qualifications; identify training needs and ensure resources are available to support training programs; document training and maintain records of all training sessions).

An example of a completed *Technical Capability* form (December 2019) was viewed during the interview for a Process Engineer. Evidence was provided of two operators progress in completing the NWP30219 - Certificate III in Water Industry Operations, noting that face to face training was delay due to COVID-19 restrictions (email correspondence).

During the interview we viewed the Compass program where training records are kept. Training records were either held locally or in Compass. Evidence of training records (sign in sheet) were provided for West Camden, including *CWH RW Overview* (30/01/2020) and *CWH Lab Schedule* 23/01/2020. The records for both these training sessions were paper-based and held locally.

Element 10 Documentation and reporting

Management of documentation and records

Sydney Water demonstrated the implementation of the AGWR requirements to:

- ensure current versions of recycled water quality management documentation are in use through their BMIS and supporting review processes. During the interviews Sydney Water demonstrated that the procedures were maintained on BMIS and that there were not out of date documents for the West Camden WRP.
- establish a records management system and ensure that employees are trained to fill out records. We viewed the records associated with the different systems that Sydney Water uses including SWIRL, MAXIMO and Compass as well as paper records associated with their quality management system. Specific observations are discussed throughout the report.

There is a requirement in the IPART Reporting Manual that Sydney Water to include: "An assessment of the performance of critical control points (as identified by the Water Quality Management Systems) over the long-term in accordance with the ... Australian Guidelines for Water Recycling". Sydney Water advised they did not undertake this analysis for recycled water as a number of the plants did not have the reporting tools to do this consistently. Additional evidence was requested and provided that demonstrated Sydney water maintained the appropriate records for CCP monitoring.

Reporting

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (establish procedures for effective internal and external reporting; produce an annual report aimed at users of recycled water, regulatory authorities and stakeholders).

Sydney Water produced the reports required under their RWQMS and the IPART Reporting Manual. However not all of the requirements of the Reporting Manual were addressed in the *Recycled Water Annual Compliance Report*. These deficiencies discussed and are graded at Clause 10.2.

Element 11 Evaluation and audit

Long-term evaluation of results

Sydney Water has provided sufficient evidence to demonstrate implementation with the AGWR requirements of this component (Collect and evaluate long-term data to assess performance and identify problems; document and report results).

The *Quarterly Recycled Water Monitoring Reports* for NSW Health (3rd and 4th Quarter) provided evidence of the 12-month rolling average analysis of the verification data.

Each quarter, statistical analyses of 12-month rolling window of data are performed. The *Quarterly recycled water monitoring report for NSW Health 19-20 3rd Quarter* was provided as evidence. Findings and any associated actions are presented at each Joint Operational Group meeting.

The Wollongong Stage 1 and 2 Risk Assessment Reports, undertaken in the audit period, included the statistical analysis and trending of 10 years of water quality data and against the AGWR microbiological, long-term value and short-term value. The evaluation of results focuses of verification results rather than CCPs. Sydney Water is schedule to have all of the CCPs for the WRPs online by the end of the year. Evaluation of CCP performance should become embedded within the organisation for short- and long-term performance evaluation and reporting.

Audit of recycled water quality management

Sydney Water conducted 2 audits of the WRPs in the audit period. A third was scheduled for early June but was delayed due to COVID-19 workplace isolation requirements and undertaken on 1/7/2020 (just outside the audit period). We have considered the delay valid and consider the audit report and its findings relevant evidence of the implementation of the audit process.

Element 12 Review and continuous improvement

Reviewed by senior managers

The Management Systems presentation from the 14 November 2019 was provided as evidence that the senior executive has reviewed the effectiveness of the recycled water quality management system and evaluated the need for change. The attendees at the management meeting included General Managers, Heads of Department (including Risk) and relevant managers. The reporting for recycled water focussed on verification compliance, and did not report of on Sydney Water's preventative approach to water quality management through the CCPs. This approach contrasted with Sydney Water's drinking water quality reporting which did reporting on preventative management.

Recycled water quality management improvement plan

Sydney Water has provided sufficient evidence to demonstrate they had implemented the AGWR requirements to develop a recycled water quality management improvement plan; ensure that the plan is communicated and implemented, and that improvements were monitored for effectiveness.

Sydney Water have developed a consolidated Recycled Water Improvement Register. This initiative provides organisation-wide visibility to the improvement actions at individual plants. Action items from the recycled water risk assessments are transferred to this register if they are significant or apply to more than one site. Plant improvements are added to the relevant Hub Master Action List. We requested and were provided with evidence that actions identified at the Liverpool risk assessment had been transferred to the Georges River Hub Master Action List and implementation of the actions had commenced (*Liverpool WRP: Action Plan to Optimise RW supply Reliability*).

The development of the Recycled Water Dashboard (as part of the improvement plan) in the improvement plan is strong evidence that Sydney Water implements and communicates its improvements. Sydney Water provided evidence that plan was presented to NSW Health during the quarterly JOG meetings.

Sydney Water closed off 12 items on the improvement plan in 2019/20 and added 6 actions.

Recommendation

Recommendation 4.2.3-1: By 30 June 2021, Sydney Water must review permissions and limits in SCADA to ensure that changes outside critical limits can only be made in accordance with an appropriate change management procedure and that critical limits align with the critical control point documentation for all plants.

Recommendation 4.2.3-2: By 30 June 2021, formalise the review of recycled water verification report, to be explicit about the need to manually check that exceptions are included in the Irrigation Scheme Monthly reports, and train staff in the updates.

Opportunities for improvement

OFI 4.2.3-1: Implement the use of virtual tags in SCADA (as noted at the drinking water treatment plants) to display data for critical control point parameters only when water is supplied to end users, to more easily review critical control performance.

OFI 4.2.3-2: Improvement to the reporting process is recommended on how *E. coli* exceptions are distinguished in the monthly reports from those that are notifiable under the *Recycled Water Quality Event Management Plan (WR5271)*.

Clause 5.1 – Water Continuity Standard

Clause 5.1.1

Table 16. Clause 5.1.1 compliance grade				
Subclause	Requirement		Compliance grade	
5.1.1	Sydney Water must ensure that, in each financial year, at leastNon-compliant9,800 Properties per 10,000 Properties (in respect of which Sydney(non-material)Water provides a Drinking Water supply service) receive a DrinkingWater supply service unaffected by an Unplanned WaterInterruption (the Water Continuity Standard).Standard)		Non-compliant (non-material)	
Risk		Target for full compliance		
If more properties experience unplanned water interruptions than the standard, customers will have not received the level of service they have paid for and there may be public health impacts.		To achieve compliance, it must be demonstrated that at least 9,800 properties per 10,000 properties receive supply unaffected by an unplanned interruption.		

Summary of reasons for grade

In 2019/20, there were 48,550 properties impacted by Unplanned Water Interruptions. This equates to 9,763 properties per 10,000 properties unaffected by an Unplanned Water Interruption which is below the minimum standard of 9,800 properties per 10,000 properties.

This clause is Non-compliant (non-material).

Discussion and notes

This clause requires that Sydney Water ensure that, in each financial year, at least 9,800 properties per 10,000 properties (in respect of which Sydney Water provides a drinking water supply service) receive a drinking water supply service unaffected by an unplanned water interruption. This is known as the water continuity standard.

Under Sydney Water's operating licence, an unplanned water interruption is defined as an event where:

- The supply of drinking water at the first cold water tap of a property is interrupted without the customer or consumer having received prior notice of that interruption from Sydney Water
- It takes more than five continuous hours for normal supply of drinking water to be restored to the property.

Process

Data for water continuity events is initially logged in two separate systems; service faults and network events are logged in Maximo, whereas service requests and customer complaints are logged in SAP. Any work orders resulting from service requests and customer complaints are then logged in Maximo. The majority of work orders are serviced by Sydney Water's Network Team, with contractors only called in for specialist work requests. Field data from the Network Team is logged in real time using Panasonic Tough Books that are linked to Maximo. The location of the Network Team is also tracked via the Global Positioning System by the field supervisor.

As part of this process, field crews are able to undertake a network trace using a geographic information system application, Tensing, to identify the properties affected by the unplanned water interruption. The affected properties are then sent to the billing system to be captured with the associated work order number.

Sydney Water has in place *Maintenance Crew ClickMobile Work Instructions* (Version 1). These work instructions document the procedure to log data in the field, from the start to the end of the field crew member's shift. The work instructions were last issued on 5 May 2020.

Reporting

The data captured for unplanned water interruptions is reported monthly from Sydney Water's Business Intelligence system, which uses a reporting query that interrogates work order data in Maximo. This query uses relevant fields from the Maximo work order, including problem type, task code, remedy code, parent work order, reported time, actual finish time, proposed water off/on time and actual water off/on time, to identify unplanned water interruptions. The query contains checks for data completion.

Sydney Water has developed a Performance Indicator Sheet for the water continuity standard (SWIM 1278037, Version 1). This performance indicator sheet documents the indicator definition, assigned roles (indicator owner, data provider, analysis/commentary provider, reporting manager and reporting coordinator) and report details (title, report location, screenshots of results, and query details). The performance indicator sheet was last issued on 1 August 2020. We observed that the definitions contained in the performance indicator sheet are consistent with those in Sydney Water's operating licence.

Quality assurance

In addition to the data completion checks contained in the reporting query, Sydney Water advised that it runs monthly quality assurance reports and conducts six-monthly peer reviews on the reported data.

Calculations

Sydney Water advised that it analyses unplanned water interruption data on a monthly basis. This includes a forecast to the end of the year, based on historical data, to track and estimate performance against the water continuity standard.

As evidence, Sydney Water provided to us:

- A schedule of unplanned water interruptions in 2019/20 (*Maximo All Unplanned Water Interruption 20082020.xlsx*), listing, for each unplanned water interruption, fields including the work order number, interruption type, problem type, reported date and time, actual water off date and time, and restored date and time
- Network Performance Report as at June 2020

• *Operating Licence Compliance and Performance Report* for 2019 – 2023, relating to system performance standards in 2019/20.

Data trailing

We selected a small sample of work orders from the schedule of water supply interruptions and trailed them into Maximo to review the event details. The work orders trailed were: 79968706, 79138836, 78102285 and 78391864. We found that the information recorded in Maximo was consistent with that in the reporting schedule.

Conclusion

In 2019/20, there were 48,550 properties impacted by Unplanned Water Interruptions. This equates to 9,763 properties per 10,000 properties unaffected by an Unplanned Water Interruption which is below the minimum standard of 9,800 properties per 10,000 properties. As Sydney Water has missed the standard by a small margin we have assigned a grade of non-material.

We are required to provide a recommendation for all observed non-compliances. This clause was also non-compliant in the 2018/19 audit period and the recommendation focused on capturing lessons learned from one significant event. While a small number of events can impact this indicator, Sydney Water also suggests that the prolonged dry conditions in the first half of 2019/20 has contributed to the failure against this standard. We therefore make the following two recommendations:

- Sydney Water should provide updated analysis of its understanding of the relationship between prevailing weather conditions in the last five years, soil moisture and the impact on water main bursts, leaks and unplanned supply interruptions. Sydney Water should complete this analysis by 30 June 2021.
- Sydney Water should complete lessons learned reports for the five largest unplanned water supply interruption events that occurred in 2019/20 (as detailed in Table 17) and identify what measures could be implemented in future to reduce the number of properties impacted by future interruptions at these locations. Sydney Water should demonstrate how it has considered the application of these lessons learned across its entire network. Sydney Water should complete this analysis by 31 December 2021.

Reported date and time	Location
25 March 2020 11:00:00 PM	940-946 Victoria Road West Ryde
01 August 2019 10:19:35 AM	78 Bowden St Ryde
14 October 2019 03:30:00 PM	829 Punchbowl Road Punchbowl
31 August 2019 10:58:00 AM	70 Bringelly Road Kingswood
17 November 2019 12:15:00 PM	1A Naree Road Frenchs Forest

Table 17. Five largest unplanned water supply interruption events in 2019/20

Recommendation

Recommendation 5.1.1-1: By 30 June 2021, Sydney Water must provide updated analysis of its understanding of the relationship between prevailing weather conditions

in the last five years, soil moisture and the impact on water main bursts, leaks and unplanned supply interruptions.

Recommendation 5.1.1-2: By 31 December 2021, Sydney Water must complete lessons learned reports for the five largest unplanned water supply interruption events that occurred in 2019/20 and identify what measures could be implemented in future to reduce the number of properties impacted by future interruptions at these locations. Sydney Water should demonstrate how it has considered the application of these lessons learned across its entire network.

Opportunities for improvement

No opportunities for improvement identified.

Clause 5.1.2

Subclause	Requirement		Compliance grade
5.1.2	Sydney Water must use:	avel and	Compliant
	a) the water Continuity Optimal Level; and		
	b) the Water Continuity Tolerance Band,		
	as inputs to decisions regarding the design, construction, operation and maintenance of its water supply system.		
Risk Target for full compliance			
If the water continuity optimal levels and tolerance bands are not considered in decision making, it cannot be demonstrated that Sydney Water is balancing service levels with cost and risk.		Evidence that the Water Continuit the Water Continuity Tolerance B incorporate as inputs into design operation and maintenance of its system.	ity Optimal Level and Band have been a, construction, s water supply

Summary of reasons for grade

Sydney Water had demonstrated that it reflects the Performance Standard in relevant planning documents as well as internal reporting.

We have graded this clause as Compliant.

Discussion and notes

We requested Sydney Water to provide evidence of where the Water Continuity Standard has been incorporated into decision making, noting that this is a new standard within the Operating Licence which commenced in November 2019.

Sydney Water responded that the standards have been incorporated into decision making in the following ways:

- Internal reporting, and Board reporting in particular, have been updated to reflect the new standard
- A communication strategy to operational staff had commenced. However, implementation has been delayed due to the significant natural disasters which

have occurred during the audit period and which have required operational focus

- Medium- and long-term planning is being reviewed including forecasts, renewal planning and configuration management
- Relevant documentation, as set out in Table 19, refers to the operating licence standard and therefore guides decision making.

Document	BMIS reference	How this document includes or references the performance standard
Watermain Asset Management Plan	AMQ0049	The required service standards are discussed throughout this document
Water System Planning Guideline	AMQ0562	The expected outcome of this planning document is to support continuity of supply
Standard PRV Contingency Plan	D0001149	The expected outcome of this planning document is to support continuity of supply
Above Ground Pipeline Decision Framework	AMQ0136	The decision-making framework includes at Step 13 audit of outcomes which includes against the risk profile, customer service and community impacts. This by definition, includes the Service Performance Standards
Critical Water Main Renewal Decision Framework	AMQ0035	A quantitative economic determination of the consequence of failure is made considering the direct and indirect costs to Sydney Water and includes an allowance for social impacts to the community such as water discontinuity, traffic disruption and property damage.
		The decision-making framework includes at Step 10 audit of outcomes which includes against the risk profile, customer service and community impacts. This by definition, includes the Service Performance Standards
Reticulation Water Main Renewal Decision Framework	AMQ0100	The decision-making framework includes at Step 9 audit of outcomes which includes against the risk profile, customer service and community impacts. This by definition, includes the Service Performance Standards
Bonding of Works Policy	ACDP0143	The stated objective is that new connections do not adversely impact existing customers

Table 19. Example documents where water continuity standards are used for decision make	Table 19	. Example o	documents where	water continuit	v standards are	used for de	cision makir
---	----------	-------------	-----------------	-----------------	-----------------	-------------	--------------

We note that much of the documentation referred to has a passive link to the Performance Standard in that planning document refers to the Standard in generic terms so will capture any changes to the standard. We have no issue with this but note that this only provides the framework for using the Performance Standard to inform decision making. Actual use of the Performance Standard should be reflected in the analysis and decision making referred to by Sydney Water in the areas of *"forecasts, renewal planning and configuration management"*. Given the timing of introduction of the new Performance Standards, we accept that Sydney Water is compliant with the Standard for the current audit period on the basis of its updates to reporting and the implicit reference within planning documents but expect for future audit periods that Sydney Water should be able to provide analysis of how the Performance Standards have influenced expenditure planning decisions in the short-term and in long-term forecasts. We have recorded this as an opportunity for improvement.

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

OFI 5.1.2-1: Sydney Water should provide analysis of how the Performance Standards have influenced expenditure planning decisions in the short-term and in long term forecasts for the next audit period.

Clause 5.2 – Water Pressure Standard

Clause 5.2.1

Fable 20. Clause 5.2.1 compliance grade					
Subclause	Requirement		Compliance grade		
5.2.1	Sydney Water must ensure that, in each financial year, at least 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service affected by fewer than 12 Water Pressure Failures (the Water Pressure Standard).		Compliant		
Risk		Target for full compliance			
If more properties experience water pressure failures than the standard, customers will have not received the level of service they have paid for and there may be public health impacts.		o achieve compliance, it must be demonstrated that at least 999 properties per 10,000 properties receive supply affected y fewer than 12 Water Pressure Failures.			

Summary of reasons for grade

Sydney Water has demonstrated that at least 9,999 properties per 10,000 properties received supply affected by fewer than 12 Water Pressure Failures in 2019/20.

This clause is graded Compliant.

Discussion and notes

This clause requires that Sydney Water ensure that, in each financial year, at least 9,999 properties per 10,000 properties (in respect of which Sydney Water provides a drinking water supply service) receive a drinking water supply service affected by fewer than 12 water pressure failures. This is known as the water pressure standard.

Under Sydney Water's operating licence, a water pressure failure is a situation in which a property experiences a pressure of less than 15 metres head of pressure for a continuous period of one hour or more. Such head of pressure is measured at the point of connection (usually the main tap) of the property to Sydney Water's drinking water supply system.

Process

Sydney Water uses pressure gauges that are connected to Sydney Water's telemetry system, IICATS, to identify pressure failures. Sydney Water advised that these gauges are calibrated as per manufacturer guidelines. Sydney Water does not use modelling to determine pressure failures.

Pressure enquiries and complaints are also initiated by customers through the call centre and logged in Sydney Water's customer relationship management software. Sydney Water has developed an electronic "WR8" form to manage this process and the interfaces between its teams. Pressure enquiries and complaints are managed through the *Water pressure customer complaint management process* (DOC0333.03, Version 1).

This process was last issued on 21 October 2015 and was due for review on 21 October 2017.

Sydney Water advised that low pressure readings are investigated, elevation contours are used to determine the area affected, and the number of properties affected is processed accordingly.

Sydney Water has in place an *SDIMS Work Instruction for Investigation and Reporting Water Pressure Failure* (DOC0333, Version 2). This work instruction documents definitions, responsibilities for investigating and reporting water pressure failures, and task instructions. The work instruction also documents a change history and document ownership. The work instruction was last issued on 10 January 2020.

Reporting

Sydney Water advised that the data captured for pressure failures is reported weekly from its Business Intelligence system by using a reporting query.

Sydney Water has developed a *Performance Indicator Sheet* for the water pressure standard (SWIM 1278038, Version 1). This performance indicator sheet documents the indicator definition, assigned roles (indicator owner, data provider, analysis/commentary provider, reporting manager and reporting coordinator) and report details (title, report location, screenshots of results, and query details). The performance indicator sheet was last issued on 1 August 2020. We observed that the definitions contained in the performance indicator sheet are consistent with those in Sydney Water's operating licence.

Sydney Water has in place a *Compiling Water Pressure Failure Data in Table2* work instruction (DOC0333.04, Issue 1). This work instruction documents the procedure for reporting and compiling water pressure failure data. The work instruction also documents a change history. The work instruction was last issued on 10 November 2019.

Quality assurance

Sydney Water advised that it conducts monthly cross reviews on the reported data.

Calculations and data trailing

Sydney Water advised that it analyses pressure failure data on a monthly basis. This includes a forecast to the end of the year to track and estimate performance against the water pressure standard.

We requested Sydney Water to provide evidence of its reconciliation reports / investigations (including pressure contours) to confirm the number of impacted properties for the two low pressure incidents at Hall Street, Pitt Town on 13/12/2019 and 14/12/2019. Sydney Water provided this information to us and we are satisfied that the investigations support the reported data.

Conclusion

We conclude that Sydney Water has provided sufficient evidence in the form of the lowpressure events schedule, investigation and reporting procedures and incident investigation reports to demonstrate that it has met the Performance Standard.

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

No opportunities for improvement have been identified.

Clause 5.2.5

may expect.

Table 21. Clau	se 5.2.5 compliance grade		
Subclause	Requirement		Compliance grade
5.2.5	 For each Property Cluster, Sydney Water must: a) by 30 June 2020, review its business processes to ensune no Property at risk of being affected by recurring Water Failures from the same cause is connected to Sydney Water Supply system, unless the owner (at the to connection) is: i. informed of that risk; and ii. provided with options to reduce that risk 		Non-compliant (non-material)
Risk		Target for full compliance	
If the business processes are not updated, customers may unknowingly purchase a property at risk of recurring Water Pressure Failures and therefore not receive the level of service they		Evidence that relevant business processes have been updated so that the owner of any property to be connected to the network within a cluster is informed of the risk and provided with options to	

Summary of reasons for grade

Sydney Water provided evidence that the relevant business process, the *Watermain connections staff guide* was updated within its business systems before 30 June 2020. We found that the business process omits two of the low-pressure clusters that have been identified through reporting against the performance standard. Therefore, we conclude that Sydney Water is non-compliant against this obligation as it has not included all relevant clusters within the business process. We consider that the non-compliance is non-material, given that the total number of properties in these clusters (13 properties) is equal to 16% of the total number of properties across all clusters (83 properties). This clause is graded Non-compliant (non-material).

reduce the risk.

Discussion and notes

Sydney Water advised that it has identified the following Property Clusters that are affected by recurring Water Pressure Failures prior to the Commencement Date:

- North Richmond and Wilberforce
- Bankstown (Bedwell Ave & Edith Street)

- Buxton (Greetham Road)
- Denham Court (Fox Valley Road).

We requested Sydney Water provide mapping of these clusters to the schedule of water pressure failures reported for Clause 5.2.1. Sydney Water provided this mapping and we reviewed this information to confirm the consistency between the clusters identified and the water pressure failures that have been identified. Sydney Water notes that these clusters experience low pressure almost every day because they are at a high elevation relative to the supplying reservoir. Other properties that experienced low pressure experienced it during high demands which are only a few days a year as evidenced by the compliance spreadsheet.

Sydney Water advised that to meet the requirements of this clause it updated the *Watermain connections staff guide* to reflect the new process and to identify low pressure areas. The updated document was then uploaded to SWIM and a link to the document saved in Helix. Sydney Water provided to us an email dated 22 June 2020 to confirm that the updated business process was in place before 30 June in SWIM and Helix.

We reviewed the low-pressure clusters listed in the Watermain connections staff guide against the low-pressure clusters detailed in the schedule of low-pressure events reported against the Performance Standard. This comparison is shown in Table 22 and shows that the business process omits two of the low-pressure clusters that have been identified through reporting against the performance standard. Therefore, we conclude that Sydney Water is non-compliant against this obligation as it has not included all relevant clusters within the business process. We consider that the non-compliance is non-material, given that the total number of properties in these clusters (13 properties) is equal to 16% of the total number of properties across all clusters (83 properties) (property numbers as advised by Sydney Water).

Clusters recorded in monthly reports of low-pressure clusters	Clusters reported in Appendix 2 of Watermain connection staff guide
Kurrajong	Not included
North Richmond	North Richmond and Wilberforce
Horsley Park	Not included
Bass Hill	Bankstown (Bedwell Ave & Edith Street)
Buxton	Buxton (Greetham Road)
Denham Court	Denham Court (Fox Valley Road)

 Table 22. Mapping of low-pressure areas between Performance Standard report and Watermain

 connection manual

Recommendation

Recommendation 5.2.5-1: By 31 March 2021, Sydney Water must update its business process manual to fully and accurately reflect low pressure clusters.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 5.3 – Dry Weather Wastewater Overflow Standard

Clause 5.3.1

Subclause	Requirement		Compliance grade
5.3.1	Sydney Water must ensure that, in each financial year, at least:Complianta) 9,928 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service unaffected by an Uncontrolled Wastewater Overflow; andDescription b) 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service but excluding Public Properties) receive a sewerage service but excluding Public Properties) receive a sewerage service affected by fewer than three Uncontrolled Wastewater Overflows, (the Dry Weather Wastewater Overflow Standard).		Compliant
Risk		Target for full compliance	
If more properties experience Uncontrolled Wastewater Overflows than the standard, customers will have not received the level of service they have paid for and there may be public health impacts.		To achieve compliance, it must be de least 9,928 Properties per 10,000 Pro which Sydney Water provides a sewe excluding Public Properties) receive unaffected by an Uncontrolled Wast that at least 9,999 Properties per 10, respect of which Sydney Water prov service but excluding Public Propert sewerage service affected by fewer to Uncontrolled Wastewater Overflows	emonstrated that at operties (in respect of erage service but a sewerage service ewater Overflow; and .000 Properties (in ides a sewerage ies) receive a :han three

Summary of reasons for grade

Sydney Water has demonstrated that more properties than the lower limit have been unaffected by an Uncontrolled Wastewater Overflow and that more properties than the lower limit have been unaffected by more than three Uncontrolled Wastewater Overflows.

This clause is graded Compliant.

Discussion and notes

This clause requires that Sydney Water ensure, in each financial year, at least:

- 9,928 Properties per 10,000 properties (in respect of which Sydney Water provides a sewerage service but excluding public properties) receive a sewerage service unaffected by an uncontrolled wastewater overflow
- 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding public properties) receive a sewerage service affected by fewer than three uncontrolled wastewater overflows.

This is known as the dry weather wastewater overflow standard.

Process

Sydney Water has adopted the following definitions in relation to dry weather wastewater overflows:

- An uncontrolled dry weather wastewater overflow is a wastewater overflow occurring in dry weather that is not a controlled wastewater overflow
- A controlled wastewater overflow is a sewage overflow that is directed by Sydney Water via a designated structure to a predetermined location, such as a stormwater drainage system or waterway, in order to prevent overloaded or blocked sewers from discharging at sensitive locations, on private property or within buildings
- An uncontrolled wastewater overflow will be taken to have commenced on the earlier of the following:
 - When a person notifies Sydney Water that a property (which may include a public property) has experienced a sewage overflow which Sydney Water confirms is an uncontrolled wastewater overflow
 - When Sydney Water's systems identify that a property (which may include a public property) has experienced an uncontrolled sewage overflow.
- Public property is real property vested in or under the control of a Minister of the Crown or public authority, excluding so much of such real property as is leased, licensed or used for private purposes.

Sydney Water advised that its systems identify the wastewater overflow category based on the overflow point. Sydney Water also advised that its civil staff are trained to be able to identify the different categories of wastewater overflows, with training modules maintained in Sydney Water's Compass system.

Reporting

The data captured for dry weather wastewater overflows is reported monthly from Sydney Water's Business Intelligence system, which uses a reporting query that interrogates work order data in Maximo.

Sydney Water has developed a Performance Indicator Sheet for the dry weather wastewater overflow standard (SWIM 1278039, Version 1). This performance indicator sheet documents the indicator definition, assigned roles (indicator owner, data provider, analysis/commentary provider, reporting manager and reporting coordinator) and report details (title, report location, screenshots of results, and query details). The performance indicator sheet was last issued on 1 August 2020. We observed that the definitions contained in the performance indicator sheet are consistent with those in Sydney Water's operating licence.

Quality assurance

Sydney Water advised that the reported data is validated against its customer relationship management system, as well as Maximo, to identify and rectify any omitted properties that are subject to an uncontrolled sewage overflow rebate.

Calculations

Sydney Water advised that it analyses dry weather wastewater overflow data on a monthly basis. This includes a forecast to the end of the year to track and estimate performance against the dry weather wastewater overflow standard.

As evidence, Sydney Water provided to us:

- An annual calculation spreadsheet for 2019/20 (*Maximo All Wastewater Overflow Impacted Properties Report 20082020.xlsx*), listing, for each property affected by a wastewater overflow, fields such as the property number, work order number, task code, interruption time, year and month of the overflow, and rebate type
- *iConnect Wastewater Monthly Report* as at June 2020
- *Operating Licence Compliance and Performance Report* for 2019 2023, relating to system performance standards in 2019/20.

We confirmed that the total number of properties affected by dry weather wastewater overflows in 2019/20 as per the annual calculation spreadsheet (6,867 properties) is the figure reported in the iConnect Wastewater Monthly Report and Operating Licence Compliance and Performance Report.

We confirmed that the total number of properties affected by three or more dry weather wastewater overflows in 2019/20 as per the annual calculation spreadsheet (34 properties) is the figure reported in the iConnect Wastewater Monthly Report and Operating Licence Compliance and Performance Report.

We confirmed that wet weather wastewater overflows have been excluded from the reported data.

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 5.5 – Asset Management

Clause 5.5.1

Subclause	Requirement		Compliance grade
5.5.1	Sydney Water must maintain a Management System in relation to Compliant Sydney Water's Assets that is consistent with the Australian Standard AS ISO 55001:2014 Asset management – Management systems – Requirements (the Asset Management System).		
Risk Target for full compliance			
Assets are poorly managed leading to higher costs and failure to meet required service levels including public health and environmental protection.		Sufficient evidence that a Management System for assets is in place consistent with the standard and that it is maintained.	

Summary of reasons for grade

The Asset Management Policy and Strategic Asset Management Plan demonstrate that Sydney Water has in place an asset management system consistent with the requirements of ISO 55001:2014.

This clause is graded Compliant.

Discussion and notes

This clause requires that Sydney Water maintain an asset management system that is consistent with the Australian Standard AS ISO 55001:2014 Asset management – Management systems – Requirements.

Asset management system

Sydney Water has in place an Asset Management Policy (AMQ0033, Version 3). The Asset Management Policy documents Sydney Water's definition of asset management, the scope and objective of the Asset Management Policy, and guiding principles for the sustainable development and management of Sydney Water's assets. The Asset Management Policy also documents accountabilities, training and competencies, document ownership and document review. The Asset Management Policy was last issued on 25 September 2017 and is due for review every two years.

At the 31 October 2019 meeting of the Asset Management Forum, the Asset Management Forum confirmed the currency of the information within the Asset Management Policy and recommended the extension of the expiration date. An extension of the expiration date to January 2021 was subsequently approved by the document owner. Sydney Water provided to us screenshots of the document review trail from the Business Management Information System (BMIS).

Sydney Water has in place a Strategic Asset Management Plan (BMIS D0000876, Version 3). The Strategic Asset Management Plan documents:

- The purpose of the Strategic Asset Management Plan
- An overview of Sydney Water's assets and the services delivered

- The role of Sydney Water's asset management system
- The context of the asset management system, including Sydney Water's ownership structure, stakeholders and risk management process
- Sydney Water's asset management objectives
- Roles and responsibilities in maintaining and implementing the asset management system, including a Responsible Accountable Consulted Informed (RACI) matrix
- An overview of Sydney Water's asset management framework, including the scope of the asset management framework and interfaces with other management systems
- An overview of decision-making frameworks, decision-making criteria and asset management planning processes developed by Sydney Water.

Within the Strategic Asset Management Plan, a line of sight is established between the asset management objectives set in the Strategic Asset Management Plan and the asset management principles articulated in the Asset Management Policy. The asset management objectives are further linked to Sydney Water's corporate commitments and strategic objectives. The Strategic Asset Management Plan also references an Asset Management Improvement Plan and internal audit program. The Strategic Asset Management Plan was last issued on 6 March 2019.

Together, the Asset Management Policy and Strategic Asset Management Plan describe the scope of the asset management system that Sydney Water has in place, the principles and objectives for making asset management decisions and the approach taken to planning for delivering service through the asset base. The Strategic Asset Management Plan makes reference to numerous other systems and processes that support the overall approach to asset management. Some of these we discuss further under clause 5.5.2 which relates to implementation.

We consider that the Policy and Strategic Asset Management Plan reviewed provide evidence that Sydney Water has in place an asset management system consistent with the requirements of ISO 55001:2014.

External audit

In 2019/20, a certification body performed a surveillance audit of Sydney Water's asset management system against the requirements of ISO 55001:2014, documented in *Assessment Report: Sydney Water Corporation*. The surveillance audit identified several opportunities for improvement but did not identify any corrective actions. The identified opportunities for improvement largely related to training and competency, risk identification and governance structures. This audit provides further assurance that the asset management system is in place and is maintained.

Changes to asset management system

Sydney Water advised that there were no significant changes to the asset management system in 2019/20. However, Sydney Water noted a change to its organisational structure in April 2020, with consequent impacts on the ownership of the asset

management system and the responsibilities of staff in relation to the asset management system.

The Strategic Asset Management Plan is yet to be updated to reflect the change to Sydney Water's organisational structure. In particular, the roles and responsibilities of Sydney Water staff in relation to the asset management system (Section 4.4 of the Strategic Asset Management Plan) will be affected. Sydney Water advised that it is currently updating the Responsible Accountable Consulted Informed matrix for the asset management system, aligned to its current organisational structure.

Conclusion

Sydney Water has in place a management system for its assets that is consistent with the requirements of ISO 55001:2014 as evidenced by its Asset Management Policy and Strategic Asset Management Plan which describe the scope and components of the system as well as the principles used for making decisions relating to service delivery. An external surveillance audit was also undertaken during the audit period which also concluded that the asset management system meets the requirements of ISO 55001:2014. A number of opportunities for improvement were identified.

The Asset Management Policy was due for review on 25 September 2019. At the 31 October 2019 meeting of the Asset Management Forum, the Asset Management Forum confirmed the currency of the information within the Asset Management Policy and recommended the extension of the expiration date. An extension of the expiration date to January 2021 was subsequently approved by the document owner. We note that the Strategic Asset Management Plan was updated in March 2019 and is consistent with the guiding principles in the existing Asset Management Policy. This demonstrates that the Asset Management Policy remains current for informing the asset management system.

The Management System Lead sits in the Product and Asset Management Systems group.

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

OFI 5.5.1-1: Sydney Water should complete the scheduled review of the Asset Management Policy.

Clause 5.5.2

Subclause	Requirement		Compliance grade
5.5.2	Sydney Water must ensure that the Asset Management System isNon-compliantfully implemented and that all relevant activities are carried out in(non-material)accordance with the Asset Management System.		Non-compliant (non-material)
Risk		Target for full compliance	
Assets are poorly managed leading to higher costs and failure to meet required service levels including public health and environmental protection.		Sufficient evidence that a Management System for assets is in place consistent with the standard and that it is maintained.	

Table 25. Clause 5.5.2 compliance grade

Summary of reasons for grade

Sydney Water has undertaken significant activity in the audit period including awareness, training, internal and external audits and management reviews that demonstrate that it is implementing its asset management system. However, there currently exists a backlog of inspections for sewage pumping stations and recent experience has identified that catch-up inspections are identifying a material number of assets in poor and very poor condition. These are typically ancillary items which present a relatively low risk to Sydney Water achieving its asset management objectives.

This clause is graded Non-compliant (non-material).

Discussion and notes

This clause requires that Sydney Water ensure the asset management system is fully implemented and that all relevant activities are carried out in accordance with the asset management system.

Communication, training and awareness

We challenged Sydney Water to demonstrate how staff were aware of the asset management system and its relevance to their various roles within the organisation. Sydney Water advised that "regular communication on important matters" related to the asset management system occurs via a series of forums attended by senior management and middle management. These forums, which are responsible for asset management governance in Sydney Water, include:

- Product and Asset Leadership Group
- Asset Management Forum
- Functional Process Councils (Maintenance Process Council, Renewal Process Council and Monitoring Process Council).

As evidence, Sydney Water provided to us:

- The Terms of Reference for the Product and Asset Leadership Group (BMIS D0000676) (1 October 2017)
- The Terms of Reference for the Asset Management Forum (BMIS D0000675) (1 October 2017)

- An example agenda for the Product and Asset Leadership Group (2 October 2019 meeting)
- An example agenda for the Asset Management Forum (25 September 2019 meeting).

Sydney Water advised that specific matters are communicated to senior executives through executive papers. As evidence, Sydney Water provided to us an executive briefing on Sydney Water's participation in Water Services Association of Australia's (WSAA) Asset Management Customer Value (AMCV) benchmarking and maturity assessment project. Sydney Water also provided to us a letter from the Head of Service Planning and Asset Strategy, Sydney Water to all Heads of Business accountable for asset management functions, providing information on the WSAA AMCV project and seeking representatives from across the business.

Sydney Water also provided to us a register of training and awareness activities carried out in 2019/20 in relation to the asset management system.

Audits and reviews

The implementation of the asset management system is monitored through audits (internal and external audits) and reviews.

In 2019/20, a certification body performed a surveillance audit of Sydney Water's asset management system against ISO 55001:2014, documented in *Assessment Report: Sydney Water Corporation.* The surveillance audit identified several opportunities for improvement. The identified opportunities for improvement largely related to training and competency, risk identification and governance structures.

Sydney Water also performs internal audits as part of an assurance program for its asset management system. In 2019/20, Sydney Water performed internal audits on five asset types and asset management subjects:

- Wastewater rising mains
- Water and wastewater valves and pumping stations
- Asset renewals management
- Integrated planning
- Maintenance Management Framework and Maintenance Process Council.

The internal audits found no non-conformances. However, a number of improvement opportunities were identified, typically relating to documentation of processes, training, integration of asset management planning functions across the organisation, and risk identification and management.

Sydney Water advised that audits are recorded in BMIS, with corrective actions and improvement opportunities entered into the same database and progressed through a workflow.

In addition to internal and external audits, senior management in Sydney Water perform an annual review of the performance of the asset management system. In 2019/20, a management review encompassing 1 July 2018 to 31 October 2019 was conducted and documented in *Asset Management System (AMS) Annual Management*

Review: 1 July 2018 – 31 October 2019 (dated November 2019). This review identified eight recommendations. The Asset Management Improvement Plan, endorsed by the Asset Management Forum, was included as an appendix to the review report.

We consider that the internal and external audits, as well as management review and the participation in the benchmarking exercise provided strong evidence of Sydney Water's ongoing implementation of its asset management system.

Sewage pumping stations

We selected sewage (wastewater) pumping stations as an asset class to review the implementation of the asset management system in more detail.

Sydney Water has in place an Asset Master Plan for wastewater pumping stations, low pressure sewerage systems and vacuum sewerage systems (AMQ0021, Version 4). This Asset Master Plan documents:

- Purpose and scope of the Asset Master Plan
- Outcomes and benefits of the Asset Master Plan
- Asset overview
- Performance criteria
- Performance and gap analysis, including consequence of failure
- Future requirements
- Planning needs
- Asset strategy
- Action plan
- Investment plan.

The Asset Master Plan also documents a change history, document ownership and requirements for document review. The Asset Master Plan was last issued in 2019 and is due for review annually.

Sydney Water has in place a consequence of failure assessment guideline for sewage pump stations, vacuum sewerage systems and low-pressure sewerage systems (BMIS D0001090, Version 2). Under this guideline, each facility is separated into seven standard sub-processes, and the consequence of failure of each sub-process is assessed against nine consequence categories. The guideline also documents a change history and document ownership. The guideline was last issued on 3 September 2019.

As evidence of the application of the consequence of failure assessment guideline, Sydney Water provided to us a spreadsheet detailing the assessed consequence of failure for each sub-process at each facility (*D0001090 - Appendix B - SPS Condition and Risk Rating.xlsx*). We reviewed this assessment and consider it is sound. It suggests that detailed consideration has been given to management of the consequence of failure of the facilities.

Sydney Water advised that condition assessments of sewage pumping stations are generally a combination of desktop assessments to identify aging equipment and field-based visual inspections to determine condition and evaluate the need for intervention.

Sydney Water has developed a rolling, five-year visual inspection program for all its sewage pumping stations.

As evidence, Sydney Water provided to us a spreadsheet summarising the five-year sewage pumping station inspection program for 2018 – 2022 (*SPS Inspection Program 2018 – 2022.xlsx*). We observed that of the 380 facilities scheduled for inspection between January 2018 and June 2020 (inclusive), 140 facilities were yet to be inspected as at 4 August 2020. We consider that the backlog of inspections is evidence that the asset management system is not fully implemented as required by the licence obligation as the actions to mitigate known potential risks have not been implemented. We comment on the materiality of this non-compliance at the end of this section.

Sydney Water advised that further assessments arising from the inspection program may include checking pump performance (e.g., pump run times), equipment failure rates, equipment maintenance records or equipment obsolescence, or directly consulting the maintenance service provider. Sydney Water also advised that, where evidence of significant deteriorating condition is sighted during visual inspections, more detailed inspections are performed and, where necessary, appropriate interventions are recommended. As evidence, Sydney Water provided to us a schedule of Level 2 (more detailed) sewage pumping station inspections for 3 April 2020 to 12 May 2020 (7765A, Version 2), dated 6 April 2020.

In the previous financial year (2018/19), a significant structural failure occurred at SP0103 (Northmead sewage pumping station). Sydney Water subsequently undertook a desktop review of all its sewage pumping stations to identify those constructed in a similar era or with a similar design or construction. As a result of the desktop review, Sydney Water identified 85 similar sewage pumping stations and, between November 2018 and September 2020, conducted Level 1 and Level 2 inspections at all identified facilities. As evidence, Sydney Water provided to us a letter from the Head of Wastewater and Environment, Sydney Water to the Manager Regulatory Operations Metropolitan South, Environment Protection Authority, dated 18 September 2020, outlining the actions taken since the failure of SP0103.

This letter sets out that arising from the initial Level 1 inspections a "Phase 1" program of Level 2 inspections of 40 pumping station was completed between August 2019 and October 2019. This audit found a total of 539 action items arising from the inspections, an average of 13.5 per pump station. Of the total number of action items, 137 were classified as corresponding to a level 4 or level 5 (poor or very poor) condition grade. This is an average of 3.9 action items per pump station in these two worst categories. A summary of the action items identified is provided in Table 26.

Summary item	Condition based asset valuation (CBAV) grade				Total No.	Percentage (%)	
	1	2	3	4	5		
	Very	Good	Fair	Poor	Very		
	Good				Poor		
Further inspection required	0	47	59	12	3	121	22%
Concrete repair	0	24	30	5	1	60	11%
Seal infiltration	0	23	20	21	0	64	12%
Repair pump/pipe valve supports	0	17	41	50	14	122	23%
Mechanical repair	0	20	11	3	0	34	6%
Electrical repair	0	1	0	0	1	2	0%
Corrosion protection (painting)	0	30	46	34	0	110	20%
Clear drain	0	1	1	5	0	7	1%
General cleaning	1	8	3	7	0	19	4%
Total No	1	171	211	137	19	539	
%	0%	32%	39%	25%	4%		

Table 26. Action items identified from Phase 1 Level 2 SPS inspections

Source: Sydney Water

It is not possible to comment on the level of risk that would be assessed by Sydney Water under its asset risk framework as the consequence of failure is specific to the operating context of the pumping station and the different sub-processes within the pump station. However, as a general observation, poor and very poor condition items will generally lead to higher risks for more important assets. By inspection, some of the items to which the poor and very poor rating apply appear important to the function of the pump station, e.g. concrete repair, seal infiltration, corrosion repair and repair pump/pipe valve supports.

We clarified with Sydney Water whether our perceived level of risk was in line with its understanding of the risk associated with these items. Sydney Water provided information which demonstrated that the issues identified generally related to ancillary equipment such as ladders, step irons and handrails, which do not affect the normal operation of the pumping station. On the basis of this information provided by Sydney Water, we conclude that the observed non-compliance is non-material.

Recommendation

Recommendation 5.5.2-1: By 31 December 2021, Sydney Water must review its inspection programs for all asset classes to incorporate lessons learned from its current inspection program for sewage pumping stations. The output should be an updated condition assessment strategy (or similar) document(s) that specifies the desired approach to condition assessment for all major asset classes including (for example):

- Consideration of risk of asset failure and consequence of failure
- Frequency of inspection

- Level of inspection (visual v detailed inspection) and situations where more detailed inspections are warranted
- Inspection techniques
- Resourcing and support considerations such as access and shutdowns

Opportunities for improvement

No opportunities for improvement were identified.

Clause 6.4 – Assistance Options for Payment Difficulties and Actions for Non-Payment

Clause 6.4.1

Table 27. Clause 6.4.1 compliance grade						
Subclause	Requirement	Compliance grade				
6.4.1	Sydney Water must maintain and fully i	Compliant				
	a) a payment difficulty policy that assist experiencing payment difficulty to bette and future Bills;					
	b) procedures relating to a payment plan for residential Customers who are responsible for paying their Bills and who are, in Sydney Water's reasonable opinion, experiencing payment difficulty;					
	c) procedures for identifying the circumstances under which Sydney Water may disconnect or restrict the supply of water to a Customer's Property; and					
	d) provisions for self-identification, identification by community welfare organisations and identification by Sydney Water of residential Customers experiencing payment difficulty,					
	(the Assistance Options for Payment Difficulties and Actions for Non-Payment).					
Risk		Target for full complian	ce			
Failure to comply with the requirements of this obligation presents a risk that Sydney Water creates financial or personal hardship for customers that could otherwise be avoided through implementing		Evidence that Sydney Water has in place the required policy and procedures relating to customers experiencing payment difficulties as well as procedures for where restrictions and				

Summary of reasons for grade

payment difficulty measures.

Sydney Water has in place policies and procedures for customers experiencing payment difficulties as well as procedures for entering into payment plans and applying restrictions and connections to supply. Sydney Water provided evidence as to how it is implementing these procedures which included records of customer contact, information provided to customers, information provided to welfare agencies and training records for staff.

disconnection of supply may occur.

This clause is graded Compliant.

Discussion and notes

Sydney Water had in place a Payment Assistance policy for the audit period 2019/20. Version 4 of the Policy was issued on 30 October 2019 following review of the previous version against the requirements of the new Operating Licence. Sydney Water provided to us an approval document showing the changes made to the Policy to account for the new licence. These changes were:

• Inclusion of assistance for non-residential customers

• Minor text edits to improve readability.

The changes to the Policy were approved by the Head of Customer Services.

The Policy has two stated objectives, firstly to "keep the water on" and secondly to "pay your bill in a way that you can manage".

The Overdue payments procedure sets out procedures relating to putting in place payment plans as well as the circumstances under which Sydney Water may restrict or disconnect customers. Payment plans are considered alongside the other types of assistance provided to customers. The assistance that may be provided to customers include deferral of payment of the bill in full to a mutually acceptable date, putting in place an instalment arrangement (payment plan) or accessing a flexipay card that allows payment of smaller, regular amounts. Customers may be assessed as qualifying for payment assistance by Sydney Water' Customer Care team or by an accredited welfare agency. There is also in place a Payment Assistance Scheme procedure which describes the conditions for providing financial assistance to customers through the Customer Care team or in coordination with welfare agencies to low income households.

The circumstances under which Sydney Water may disconnect or restrict the supply of water to a Customer's Property is set out in the Overdue Payments Procedure. These actions are pursued when customers do not respond to preceding notices. An outstanding debt notice is generated and sent when payments are seven days overdue. If payment is still not made and the customer does not contact Sydney Water then a reminder notice may be sent. Sydney Water seeks to make contact with the customer at this stage and may visit the property and also communicate through other known addresses.

Customers in hardship may be identified by Sydney Water's Customer Care team as well as accredited welfare agencies. Customers may self-identify to the Customer Care team. Sydney Water explained that its staff are provided training to identify and respond to the needs of customers experiencing payment difficulty.

The preceding demonstrate that Sydney Water has in place the policies and procedures to meet the requirements of this clause.

Sydney Water provided to us an example of a reminder notice dated 17 June 2020 which includes information on the options available for those experiencing payment difficulties. This demonstrates that Sydney Water is providing information to customers to help them to self-identify as requiring payment assistance.

Sydney Water also provided to us an example of a questionnaire completed by its Customer Care team for a customer which led to them being identified as in hardship. This led to the customer being included in the Bill Assist program in October 2019.

Sydney Water also provided to us the checklist and guidance note that it provides to welfare agencies to assist them in identifying customers for inclusion on the Payment Assistance Scheme.

Sydney Water provided to us a timetable for staff training from February 2020 as well as a record of training completed by individuals as recorded in its Compass system. These

provide further assurance that Sydney Water is implementing its policies and procedures in this area.

Sydney Water detailed that due to the drought, bushfires and the flood in late 2019 and early 2020, it ceased collection activities between November 2019 and February 2020. From late March until 30 June 2020 (and ongoing), Sydney Water also ceased restrictions and disconnections in consideration of the customer impact of COVID-19.

Based on the preceding examples, we conclude that Sydney Water is implementing its policies and procedures for assisting customers experiencing payment difficulties.

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 6.4.2

Table 28. Clause 6.4.2 compliance grade							
Subclause	Requirement	Compliance grade					
6.4.2	Sydney Water must provide, free of cha Assistance Options for Payment Difficul Payment on its website and to:	Compliant					
	a) all residential Customers, at least anr						
	b) residential Customers who Sydney Water identifies as experiencing payment difficulty on the date that Sydney Water first identifies that the Customer is experiencing payment difficulty; and						
	any other person upon request made to the Contact Centre.						
Risk		Target for full complian	ce				
Failure to comply with the requirements of this obligation presents a risk that Sydney Water's customers experience financial hardship that could otherwise be avoided if they were aware of the payment difficulty measures in place.		Evidence that Sydney Water has provided to its customers information on Assistance Options for Payment Difficulties and Actions for Non Payment through the required channels.					

Summary of reasons for grade

There is evidence that Sydney Water provides customers information on Assistance Options for Payment Difficulties and Actions for Non Payment through its website, with bills at least annually and when customers are identified as in hardship.

This clause is graded Compliant.

Discussion and notes

We visited Sydney Water's website and were able to locate the following information relating to Assistance Options for Payment Difficulties and Actions for Non Payment:

• Payment Assistance Policy
- Overdue Payments Policy
- Customer contract
- Help with your bill web page which has an extensive range of information and links to relevant documents.

Sydney Water has in place a procedure that sets out how it plans and produces its quarterly newsletters (Waterwrap) which include the financial assistance information relevant to this clause.

To demonstrate that it provided the required information to customers at least annually with bills, Sydney Water provided correspondence from its printing provider that the information was provided within the Waterwrap newsletter insert sent to customers in the February 2020 to April 2020 period. Sydney Water also provided this version of Waterwrap to us and we confirm that it includes information on financial assistance for those experiencing payment difficulties.

Sydney Water also provided its 'Our contract with you' which summarises its customer contract to customers in the August to October 2019 period. This includes information on what customers should do if they are experiencing payment difficulties. Sydney Water provided correspondence from its printing supplier to demonstrate that this information had been provided to customers.

When a customer is identified for inclusion within a Payment Assistance Scheme, this is recorded within Sydney Water's CRM. The customer is then provided with a letter introducing the BillAssist scheme which includes information on the assistance available to them and which they are accessing. Sydney Water provided to us evidence of this process from identification to provision of the BillAssist information for an example customer.

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 6.5 – Family Violence

Clause 6.5.1

Subclause	Requirement		Compliance grade
6.5.1	Sydney Water must develop and implement a family violence Compliant policy by 1 July 2020 (or another date approved by IPART in writing).		Compliant
Risk		Target for full compliance	
Failure to develop or implement a family violence policy presents a risk that Sydney Water creates financial or personal hardship for customers affected or experiencing family violence		Evidence that a family violence has been developed by the 1 July 2020 and evidence is provided that the policy has been fully implemented	

Summary of reasons for grade

Sydney Water developed and issued the *Family Violence Assistance Policy* on the 1 April 2020, ahead of its obligation to have the policy developed and implemented by 1 July 2020. Sufficient evidence was provided that this policy had been implemented in the audit period.

This clause is considered Compliant.

Discussion and notes

A *Family Violence Assistance Policy* (1117163, version 1, dated 1/04/2020) was provided as evidence. The was published on 1st April 2020 prior to the required date of the 1 July 2020. Document version control was checked on the document management system SWIM during the interview. The upload date was marked as 2/4/2020; consistent with the issue date of the 1/04/2020. We viewed the Sydney Water website to confirm that this document was accessible. Sydney Water advised they had brought forward the timing of the policy roll out in consideration of increased risk of family violence associated with COVID-19 restrictions, and we commend them for the work.

The *Family Violence Assistance Policy* states that a case coordinator will be assigned to customers identified as experiencing, or that are affected by, family violence. A Customer Care Case coordinator position description was provided as evidence. Under Section 3 of the position description a requirement is included for tertiary qualifications (Bachelor degree) in community or social services. This requirement is consistent with that stated in the *Family Violence Assistance Policy*.

The *BillAssist case management and review procedure* (584054, ver 3, dated 6/4/2020) was provided as evidence of documentation of the process for case management and review by the Customer Care team.

Due to the confidentially required for this clause, we were not able to view any customer records directly. We viewed as evidence a deidentified case study of implementation of the family violence policy. During the interviews we also viewed a blank form that would be completed following a request from a customer. This was

consistent with the deidentified case study provided. We viewed a deidentified list of the numbers of customers accessing BillAssist as evidence of implementation.

The content of the family violence policy is discussed under clause 6.5.2

Recommendation

No recommendations are made for this clause.

Opportunities for improvement

No opportunities for improvement have been identified.

Clause 6.5.2

Table 30. Clause 6.5.2 compliance grade				
Subclause	Requirement		Compliance grade	
6.5.2	The family violence policy must, at a minimum, provide for:Complianta) the protection of private and confidential information;b) access to payment difficulty programs;c) processes that minimise the reliance on individuals to disclosetheir family violence; and		Compliant	
	d) processes for referrals to specialist services.			
Risk		Target for full compliance		
Failure to develop a family violence policy that complies with this obligation presents a risk that Sydney Water creates financial or personal hardship for customers affected or experiencing family violence		Evidence that a family violence has been developed by the 1 July 2020 and evidence is provided that the policy has been fully implemented		

Summary of reasons for grade

Sufficient evidence was provided that the Family Violence Assistance Policy (1117163) includes at a minimum protection of private and confidential information; access to payment difficulty programs; processes that minimise the reliance on individuals to disclose their family violence and processes for referrals to specialist services.

This clause is therefore assessed as Compliant.

Discussion and notes

Evidence that the Family Violence Policy (1117163) includes the obligations as specified under this clause is discussed below.

Protection of private and confidential information

Protection of private and confidential information is detailed under section 2.1 of the *Family Violence Policy*. A requirement is included that customers affected by family violence will be entered into the BillAssist program to ensure that information is protected and cannot be inadvertently provided to perpetrators or connected parties. Specific mechanisms for confidentially for customers experiencing family and domestic violence are documented in the *BillAssist Case Management and Review Procedure*

(584054) including, setting a password and submitting any information into the CRM via confidential attachments.

Access to payment difficulty programs

Assistance with payment of bills is covered under section 2.2 and 2.3 of the *Family Violence Assistance Policy.* Payment assistance can be through the following mechanisms, assistance with government concessions, help to setup Centrelink payments, payment plans or help through the Payment Assistance Scheme.

Processes that minimise the reliance on individuals to disclose their family violence

Within the Scope Section 1.2 of the *Family Violence Policy* it states that the policy covers both self-identified instance of family violence as well as those that are identified by a community service provider.

Processes for referrals to specialist services

The process for referrals to specialist services is covered under section 2.3 "We can ... refer you to a community service agency that we partner with for help. This might be for counselling services, emergency financial relief and medical advice and support".

Recommendation

There are no recommendations for this clause.

Opportunities for improvement

No opportunities for improvement have been identified for this clause.

Clause 8.1 – Negotiations with WIC Act licensees and Potential Competitors

Clause 8.1.1

Table 31. Clause 8.1.1 compliance grade				
Subclause	Requirement		Compliance grade	
8.1.1	Sydney Water must negotiate the provision of Services to WIC Act No Require licensees and Potential Competitors in Good Faith.		No Requirement	
Risk		Target for full compliance		
Failure to negotiated provisions of services to WIC Act licensees and potential competition could result in inhibited development		Evidence to show how Sydney Wat provision of Services to WIC Act lic competitor. Evidence of outcomes	ter has negotiated ensees and potential of any negotiations.	

Summary of reasons for grade

Sydney Water advised that they have not received any requests for the provision of services from WIC Act licensees or Potential Competitors during the audit period. Sufficient evidence was provided to confirm that processes were in place to receive request and that no requests had been made. We therefore have assigned an audit grade of No Requirement.

Discussion and notes

Sydney Water advised that they had not received any requests for the provision of services from WIC Act licensees or Potential Competitors during the audit period. We confirmed mechanisms are in place for WIC Act licencees or Potential Competitors to make a request to Sydney Water for a provision of service (via the Sydney Water website, contact us or urban growth email).

Evidence was provided of processes in place to receive requests and to negotiate provision of services. We viewed the Helix system *Manage Competition Business Process Area Diagram*. Processes were mapped, with the first step being to provide information to the access seeker. Evidence of documentation prior to, and following, the audit period was used to confirm that the absence of records in the audit period was evidence that no requests were received. We viewed a draft template document *Notice of a WIC Licensee Application, Assess need to respond form* (Ver 1, 17/9/2019) as evidence that a process is in place.

Sydney Water advised that they also were made aware of potential competitors through process to review WIC Act applications. A review of WIC Act applications (outside the audit date scope) was viewed as evidence that the process was occurring and that an absence of records is sufficient evidence. We therefore consider there is sufficient evidence for a finding of no requirement.

Recommendation

No recommendations have been made for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

Clause 8.3 – Code of Conduct

Clause 8.3.1

Subclause	Requirement		Compliance grade
8.3.1	Sydney Water must use its best endeavours to cooperate with each WIC Act licensee to establish a code of conduct required by a WIC Act licence where Sydney Water has received a written request from the WIC Act licensee to establish such a code.No Requirement		No Requirement
Risk		Target for full compliance	
Not having an appropriate Code of Conduct in place with each Licensed Network Operator and Licensed Retail Supplier within the Area of Operations means that governance risks to the water supply network could occur and risks to consumers ensue.		Evidence to show how Sydney Water h Licensed Network Operator and Licen within Sydney Water's Area of Operati communication had. Evidence of 'best including meetings, liaison records etc outcomes of cooperation within the au implementation of requests where exit	has identified current sed Retail Supplier ons and the type of endeavours' Evidence of udit date scope e.g. isting.

Summary of reasons for grade

No requests were made to establish a code of conduct during the audit period. Sufficient evidence was provided to confirm that processes were in place and that no requests had been made to establish a code of conduct during the audit period. This clause is therefore graded No Requirement.

Discussion and notes

Sydney Water advised that they had not received any requests form a WIC Act licensee to establish a code of conduct. Evidence of documentation prior to the audit period was used to confirm that a process is in place and that the absence of records in the audit period was evidence that no requests were received.

Sydney Water advised that the intent of the code of conduct is to clarify roles and responsibilities regarding the operation and maintenance of water industry infrastructure. There are communication or operational protocols in places for all WIC Act schemes that have a direct connection to their infrastructure. We viewed a template *Utilities Agreement* document as evidence that a process is in place with provisions relating to obligations relating to communication and incident protocols. We viewed evidence outside the audit period of a Code of Conduct for the Wilton Recycled Water Scheme at Bingara Gorge (11018, 10/10/13) and a *Utilities Service Level Agreement for Barangaroo (150626)*.

Recommendation

No recommendation was made for this clause.

Opportunities for improvement

No opportunities for improvement have been made.

Clause 10.2 – Reporting

Clause 10.2.2

Table 33. Clause 10.2.2 compliance grade

Subclause	Requirement		Compliance grade
10.2.2	Sydney Water must comply with all of its reporting and auditing Non-compliant obligations set out in the Reporting Manual, including in relation (non-material) to:		Non-compliant (non-material)
	a) water conservation and planning;		
	b) performance standards for water qu	ality	
 c) performance standards for service interruptions; d) Customers and Consumers; e) information and services for competitors; f) critical infrastructure security; and g) performance monitoring and reporting. 			
		itors;	
		ng.	
Risk	Target for full compliance		
Without accura risk that the pe	Vithout accurate and timely information, there is a Evidence that Sydney Water has provided all of isk that the performance of Sydney Water against its information for reporting and auditing as set		has provided all of and auditing as set

Summary of reasons for grade

Operating Licence requirements will not be known.

Two aspects of this clause were found to be non-compliant non-material. When reporting performance standards for service interruptions, Sydney Water did not provide information relating to major drivers for observed performance and variances to historical performance. Sydney Water also did not report on the performance of critical control points in the annual compliance and performance report for recycled water.

Based on the evidence sighted, Sydney Water did comply with reporting obligations to report CCP exceedances to NSW Health for drinking and recycled water.

The clause is Non-compliant (non-material).

Discussion and notes

This clause requires that Sydney Water comply with all its reporting and auditing obligations set out in the Reporting Manual, including in relation to:

- a) Water conservation and planning
- b) Performance standards for water quality
- c) Performance standards for service interruptions
- d) Customers and consumers
- e) Information and services for competitors
- f) Critical infrastructure security
- g) Performance monitoring and reporting.

Only sub-clauses a), b), c) and g) are within the scope of our audit.

out in the Reporting Manual and on time.

Under Sydney Water's Reporting Manual, and where relevant to the scope of our audit, Sydney Water has the following reporting obligations:

- Water conservation and planning:
 - Annual Water Conservation Report
- Performance standards for water quality
 - Quarterly Water Quality Monitoring Report Drinking Water
 - Quarterly Exception reporting to NSW Health (drinking and recycled water)
 - Monthly Reporting on fluoride monitoring to NSW Health
 - Annual Compliance and performance reporting (drinking and recycled water)
 - Incident and emergency reporting Drinking Water and Recycled Water (as required)
 - Notification of significant changes to Water Quality Management Systems (as required)
- Performance standards for service interruptions:
 - Annual Compliance and performance reporting
 - As required Strategic Asset Management Plan
- Performance monitoring and reporting:
 - Annual Statement of compliance
 - Annual Audit recommendations
 - Annual Compliance and performance reporting performance indicators
 - Annual Compliance and performance reporting environmental performance indicators.

We discuss Sydney Water's compliance with each of these obligations below.

Water conservation and planning

As noted against Clause 3.1, Sydney Water has prepared a Water Conservation Report for 2019 – 2020. We discuss the compliance of the contents of the Water Conservation Report against Clause 3.1.

Under its Reporting Manual, Sydney Water must submit the Water Conservation Report to IPART and DPIE by 1 September following the end of the relevant financial year, or another date approved by IPART. We were provided with the Water Conservation Report provided to IPART as part of the 1 September 2020 Report.

As noted against Clause 3.1, Sydney Water advised that, in 2019/20, the Minister for Water, Housing and Property did not issue a direction to update the economic level of water conservation methodology.

Performance standard for water quality

Quarterly - Water Quality Monitoring Report - Drinking Water

The Sydney Water Reporting Manual requires that Sydney Water prepares a report each quarter on their performance against all health and aesthetic water characteristics and raw water operational characteristics identified in the DWQMS and publish this report on its website within four weeks.

Sydney Water prepares quarterly reports for each of their supply systems. IPART confirmed this approach was appropriate i.e. their obligation did not require the preparation of a single report covering all the systems. Sydney Water has a Work Instruction for the *Preparation of the Quarterly Drinking Water Quality Report* (MP0023).

We were unable to easily locate the Quarterly Water Quality Monitoring Reports for the audit period on Sydney Water's homepage. Using the search function, we tested

- water quality report
- water quality monitoring report
- quarterly water quality report
- quarterly water quality monitoring report.

We contacted customer service. The officer was able to direct us to the location where the reports could be searched. To download the report, the users must enter an address relevant to the system of interest. This requires users to understand the different supply systems to be able to generate addresses relevant to the reports.

An improvement opportunity is made to improve the accessibility of these documents from the Sydney Water website.

We tested the four Quarterly Drinking Water Quality Reports for the Nepean Delivery System relevant to the audit period. They could be downloaded from the website. The document properties show that each of the four reports was produced within the required 4 weeks. Additional evidence was provided in the form of screen shots confirming the Illawarra and Prospect South report had been loaded onto the website in the required time.

We established during the audit interview that the reporting schedule relevant to Clause 10.2 was documented in the *Annual Drinking Water Quality Monitoring Plan 2019-20* (BMIS0045 01, v6). We cross checked the compliance sampling requirements with the report and found the sample numbers aligned with those in the schedule. We have seen sufficient evidence to be satisfied the Sydney Water meet its obligations for the quarterly report of drinking water.

Quarterly – Exception reporting to NSW Health and incident and emergency reporting – Drinking Water and Recycled Water (as required)

The Sydney Water Reporting Manual requires that Sydney Water prepares a report each quarter on their performance against all health and aesthetic guideline values in the

relevant monitoring program in the DWQMS and RWQMS and critical control point breaches and action taken and provide it to NSW Health within 6 weeks.

We reviewed the third and fourth quarter Recycled Water Reports prepared for NSW Health. These reports contained a number of exceedances that were detected as a consequence of routine scheduled sampling when the plant is not producing recycled water (see discussion in Clause 4.2).

Monthly - Reporting on fluoride monitoring to NSW Health

Sydney Water is required prepare a monthly a report containing fluoride monitoring information required by the *New South Wales Code of Practice for Fluoridation of Public Water Supplies* (the Code) or specified by NSW Health and submit this report to NSW Health within two weeks following the end of the relevant month.

Evidence was provided that the daily fluoride bench test results for June 2020 for the nine plants had been provided to NSW Health on 7/8/2020, which meets clause 10.2.1.2 of the Code.

The report also contained the distribution system samples for the 13 distribution systems required under clause 10.2.2.1. Sufficient samples had been taken and reported to demonstrate compliance with the code, with the exception of the Warragamba system, which had only 7 results. The report noted that "Due to fluoridation issues at Warragamba WFP, the dosing system was offline from the 05/06/2020 to the 09/06/2020. Three compliance samples were set to non-reportable. The dosing system was brought back online 09/06/2020. A Form 5 was issued to NSW Health on 05/06/2020." Therefore, for the June period Sydney Water met its obligations for fluoride reporting

NSW Health noted it had been provided with water quality reports in its submissions to IPART.

Annual – Compliance and performance reporting

The Sydney Water Reporting Manual requires that Sydney Water prepare a compliance and performance report on its management of the quality of Drinking Water and Recycled Water and submit this to IPART and NSW Health by 1 September.

The compliance and performance report must include:

- The Drinking Water and Recycled Water quality management activities and programs completed by Sydney Water in the financial year to meet its water quality objectives, including the results and outcomes from those activities and programs
- The Drinking Water and Recycled Water quality management activities and programs proposed to be undertaken by Sydney Water to meet its water quality objectives, including the expected outcomes, scope and timetable for completion
- An assessment of the performance of critical control points (as identified by the Water Quality Management Systems) over the long-term in accordance with the Australian Drinking Water Guidelines and the Australian Guidelines for Water Recycling (each, a Guideline) (as the case may be)

- An assessment of the review and continual improvement conducted over the previous 12-month period (as identified by the Water Quality Management Systems) in accordance with Element 12 of the relevant Guideline
- Any significant changes made to a Water Quality Management System
- Any non-compliance with a Water Quality Management System and the action/s taken to resolve those non-compliances.

Sydney Water addresses this obligation through the productions of the Annual Drinking Water Quality Management Compliance and Performance Report and the Annual Recycled Water Quality Management Compliance and Performance Report (referred to in the rest of this section as the Drinking Water Compliance Report and the Recycled Water Compliance Report)

An e-mail was provided showing the Drinking and Recycled Water Annual Compliance and Performance Reports for 2019-20 were submitted to NSW Health on 1/09/2020.

Both reports were structured to clearly identify the reporting requirements. We appreciate the high-level nature of the report contents is consistent with previous years' reports. However, we consider the reporting obligation has not been met. A summary of the compliance of the reports with the reporting obligations is given in Table 34.

Aspect	Observation
Completed drinking or recycled water quality management activities and programs	In both reports, this section provided a high-level overview of the implementation of the relevant water quality management system.
Proposed activities and programs	In both reports, this section provided a high-level overview of the proposed activities and programs. The documented proposed drinking water activities and programs described business as usual activities.
	As well as business as usual activities, the Recycled Water Compliance Report included "To streamline documentation for simplification and update to the same framework as recently completed for our Drinking Water Quality Management System." and "To develop improved Recycled Water critical control point reporting."
	The IPART Reporting Manual requires the expected outcomes, scope and timetable for completion for these programs and activities to be included, however this information was not included in this section of the report.
	In this section in both reports is the action to progress improvement initiatives identified in the relevant improvement register. These initiatives do have estimated completion dates; however, the scope and the outcome are not addressed.
CCP performance	The drinking water report documents performance of CCPs for the plants and OCPs for the distribution system. Drinking water customer satisfaction is also reported.
	CCP performance for recycled water was not reported. In the report Sydney Water stated that "Online critical control point (CCP) monitoring is being implemented across all recycled water plants to improve monitoring and control of recycled water systems. Online instrumentation has been implemented for UV and chlorination CCPs at all recycled water plants,

Table 34. Summary of compliance with reporting obligations

Aspect	Observation
	with one site (St Marys WRP) remaining which will be completed by December 2020."
	In the interview, Sydney Water stated that they do not have the tools in place in a number of plants to report of CCP compliance.
	The recycled water report did include the notifications made to NSW Health.
Assessment of the review and continual improvement	In both reports, this section contained selected actions from the relevant improvement register. The action, status, and estimated completion date were reported.
conducted over the previous 12 months	Completed actions were not reported in this section, although 15 recycled water and 14 drinking water actions were completed in the reporting period.
	Sydney Water has developed a dashboard for reporting improvement plan progress. This tool would be well utilised for this section of the report.
	We observed discrepancies between the dates in the Drinking Water Compliance Report and the improvement register and raised this at the audit interview. Sydney Water advised that the reason for the discrepancy may be as a result of the compliance report and the improvement plan being updated concurrently.
Significant changes	Sydney Water advised of a significant change to both systems associated with the change in public health consequence descriptors. We note that the risk matrix itself also changed at this time. This change was not flagged as significant. NSW Health advised they were made aware of the change in the matrix.
Non compliance with the management	Sydney Water has taken a narrow interpretation of "compliance" when reporting against this requirement,
system	While the Macquarie Dictionary defines compliance as <i>performance, as of a business or institution, that is within government regulations</i> , non-compliance is defined as <i>failure or refusal to comply</i> (defined as <i>to do as required or requested</i>).
	We would expect the reporting in this section to extend beyond the reporting any non-conformances noted in the ISO19001 certification and the Operational Audits. As a minimum, we would also expect internal audit findings relating to water quality to be included as well any de-briefs that indicated the management system had not been followed.

Throughout the audit we observed significant progress made by Sydney Water in drinking and recycled water management that would be appropriate to include in this report:

- The addition of water quality reviews in the scheme specific Annual System Performance Summary and the use of this analysis to inform the annual operational risk assessment.
- The consolidation of the Recycled Water Improvement Plan and the implementation of dashboard reporting for the Drinking and Recycled Water Improvement Registers.

Performance standards for service interruptions

As noted against Clauses 5.1 to 5.3, Sydney Water has prepared an Operating Licence Compliance and Performance Report for 2019 – 2023, relating to system performance standards in 2019/20. This report documents:

- System performance standards
- Monthly performance against these standards in 2019/20
- Annual performance against these standards from 2014/15 to 2019/20
- An overview of factors contributing to performance in 2019/20
- An overview of programs and initiatives in 2019/20 affecting performance against these standards.

We note that the compliance and performance report appear to contain little information in the following areas which are required under Sydney Water's Reporting Manual:

- Major factors (both positive and negative) that have influenced performance against these standards, including factors that are both within and beyond its control
- Any significant variation (both positive and negative) between performance in the financial year and performance in the previous five years.

For example, there is no discussion on the major factors that influence performance for the water pressure standard. Sydney Water has also not included discussion on variances to historical performance trends citing the change in the standard in 2019/20. We do not agree that this is grounds for omission of the discussion as Sydney Water has available to it the information to backcast performance trends. In response to the draft report, Sydney Water noted that it is limited in what it can do to make historical comparisons for this standard given the low number of properties affected and the introduction of the new standard. However, the Reporting Manual requirement to discuss major factors and significant performance variations remains.

For the Dry Weather Wastewater Overflow standard, there is no discussion on the drivers of variance for the five-year trend. Two factors impacting performance are detailed – the use of wet wipes and a decrease in preventive maintenance. However, there is no quantification of the importance of these factors compared to others factors or how these factors have varied over time. The discussion on wet wipes is informative but it is difficult to ascertain its relevance to the overall issue of dry weather overflow performance.

The discussion relating to the Water Continuity Standard is more quantitative and better aligns with the requirements. However, it is also difficult to ascertain the relative importance of initiatives such as the Customer Hub, Hydrant Wizard and Mains Wizard and active leak detection compared with more routine activities such as mains renewal, pressure management and network reconfiguration.

The report also appears to contain a lot of content about potential future initiatives (e.g. Internet of Things) which are not required under the Reporting Manual. We consider that the inclusion of this content distracts from the primary purpose of providing an accurate record of the current status of performance and understanding of reasons for

this observed performance. As the materiality or potential of these future initiatives is discussed in limited detail it may lead to the reader having a misleading impression of their relative importance, particularly when the major factors driving historical performance have not been quantified or discussed in detail.

We consider that Sydney Water's failure to adequately discuss the major factors driving performance and the variances to historical trends for two of the three Performance Standards represents a non-compliance. On balance, we consider that this is a non-material non-compliance as we understand that Sydney Water has undertaken this analysis to inform its delivery of its service objectives but has chosen not to include this information in the Compliance and Performance Report as the Reporting Manual requires.

We consider that an opportunity for improvement is that Sydney Water should only report on potential future initiatives relating to the Performance Standards when they are considered sufficiently material to impact future performance. If Sydney Water chooses to discuss future initiatives, we suggest it considers quantifying the extent of potential future trials or applications and their expected benefits such that they may be revisited in future years to assess whether the future initiatives achieved their expected benefits.

Sydney Water submitted a revised version of the Compliance and Performance Report to IPART on 23 September 2020. As evidence, Sydney Water provided to us an e-mail from the Corporate Compliance Manager, Sydney Water to IPART, enclosing the revised report and a description of the update made.

Under its Reporting Manual, Sydney Water is required to prepare a Strategic Asset Management Plan in line with AS ISO 55001:2014 and submit this to IPART by 1 February 2020, or another date approved by IPART. During the audit, we sighted an email from Sydney Water to IPART, dated 30 January 2020, enclosing the Strategic Asset Management Plan. We discuss the compliance of the contents of the Strategic Asset Management Plan against Clause 5.5.

Performance monitoring and reporting

This sub-clause requires that Sydney Water reports:

- Annually its Statement of Compliance by 1 September following the end of the relevant financial year
- Annually on status of any recommendations arising from the most recent Operational Audit and for past recommendations that are not fully implemented
- Annually against the performance and environmental performance indicators and the National Water Initiative performance indicators.

Sydney Water's Statement of Compliance has been provided to us and is dated 1 September 2020. The performance indicators and National Water Initiative reports have been provided to us.

Recommendation

Recommendation 10.2.2-1: By 31 March 2021, Sydney Water must ensure that all information required for annual compliance reporting is included with particular regards to; critical control breaches for all plants, whether automated or manually monitored, assessment of the performance of critical control points over the long term; the proposed water quality management activities and programs, including expected outcomes, scope and timetable for completion.

Recommendation 10.2.2-2: Sydney Water must provide detailed and quantitative discussion regarding the drivers for observed performance and variances to historical performance for all Performance Standards within the Performance Standards Report. This should be implemented for the next Performance Standards Report which will be for the 2020/21 year. Under Sydney Water's Reporting Manual, the Performance Standards Report is due for submission by 1 September following the end of the relevant financial year (i.e., 1 September 2021).

Opportunities for improvement

OFI 10.2.2-1: We suggest that Sydney Water consider actions that could improve the ease by which the quarterly reports can be located on their website. The use of metadata associated with the each of the file may assist. Sample addresses (such as those provided in Work Instruction *Preparation of the Quarterly Drinking Water Quality Report* (MP0023) could also be provided to allow people to easily access system-specific reports.

OFI 10.2.2-2: We suggest that Sydney Water consider incorporating the improvement plan dashboard reporting into the Annual Compliance Reports.

OFI 10.2.2-3: We suggest that Sydney Water should only report on potential future initiatives in the Performance Standards Reports when they are considered sufficiently material to impact future performance. If Sydney Water chooses to discuss future initiatives, we suggest it considers quantifying the extent of potential future trials or applications and their expected benefits such that they may be revisited in future years to assess whether the future initiatives achieved their expected benefits.

Clause 10.2.4

Table 35. Clause 10.2.4 compliance grade				
Subclause	Requirement		Compliance grade	
10.2.4	Sydney Water must maintain sufficient record systems to enable Sydney Water to report accurately in accordance with this clause 10.2.		Compliant (minor shortcomings)	
Risk		Target for full compliance		
Without accurate and timely information, there is a risk that the performance of Sydney Water against its Operating Licence requirements will not be known		Evidence that Sydney Water sufficient record systems fo	r has in place r reporting.	

Summary of reasons for grade

We consider that Sydney Water has maintained sufficient record systems to enable it to report accurately in accordance with Clause 10.2. However, there are minor shortcomings in document control and record keeping.

While Sydney Water advised they do not have the tools to report CCP compliance for recycled water at a number of plants, we were satisfied with the evidence sighted that they do maintain records of CCP compliance.

This clause is considered Compliant (minor shortcomings).

Discussion and notes

This clause requires that Sydney Water maintain sufficient record systems to enable it to report accurately in accordance with Clause 10.2.

Sydney Water advised that records are managed in accordance with its Records Management Policy (189255, Version 5) and Controlled Documents Standard (QMAF0008, Version 7). Sydney Water advised that it ensures it meets the *State Records Act 1998* (NSW) requirements through SWIM documents and the SWIM records system.

We note the following in relation to document control:

- Clause 1.7 Pricing:
 - All procedures, work instructions and tools reviewed include a version number and version date
 - Of the procedures, work instructions and tools reviewed, all but two documents have a defined document owner. A document owner is not specified in the *e-Developer: Create New DSP calculator for existing and new DSP Area* work instruction or the *Updating e-Developer CPI For Recycled Water Developer Charges for DSP Areas* work instruction.
 - Only the "Implementing IPART determined retail prices" procedure includes a review period. However, this document is overdue for review.
- Clause 3.1 Economic level of water conservation:
 - Sydney Water has summarised the economic level of water conservation methodology into a "plain English" document (*The Economic Level of Water Conservation (ELWC): Summary*), which is publicly available on its website. However, neither the complete methodology nor the plain English summary includes document control information such as a version date, change history or document owner.
 - We also note that the Water Conservation Report for 2019 2020 does not include document control information, such as a version number, version date, change history, document author, document reviewer or document approver.
- Clause 5.5 Asset management:

- There is a discrepancy between the review period specified within the Terms of Reference for the Product and Asset Leadership Group (annual review period) and the review period specified within BMIS (three-year review period). However, these Terms of Reference were reviewed in October 2020, as required by the BMIS review period.
- The letter from the Head of Service Planning and Asset Strategy, Sydney Water to the Heads of Business accountable for asset management functions is undated.
- Asset Management System (AMS) Annual Management Review: 1 July 2018 31
 October 2019 does not include a version number, change history, document author, document reviewer or document approver.

In Clause 10.2.2 we noted that Sydney Water does not report CCP compliance for recycled water as is does not have the tools in place at a number of plants to do so. We have sighted evidence for West Camden and St Mary's WRPs that records are maintained of CCP compliance.

We consider that Sydney Water has maintained sufficient record systems to enable it to report accurately in accordance with Clause 10.2. However, there are minor shortcomings in document control and record keeping.

Recommendation

Recommendation 10.2.4-1: By 30 June 2021, Sydney Water should improve document control of the records held in its systems by ensuring that information such as the version date, version number, change history and document author are included in all records.

Opportunities for improvement

No opportunities for improvement were identified.

Previous Recommendations

Recommendation 2019-01: Water Quality (Drinking water) clause 2.1.1

ltem	Detail
IPART's recommendation to the Minister	By 30 June 2020, establish a documented procedure for evaluating the chlorine solution used in the networks maintenance activities and for evaluating the associated supplier(s).
Audit findings & status	New recommendation in 2019.
	Status reported on 31 March 2020:
	On track
	Work is underway to obtain chlorine solution used in networks maintenance activities through Sydney Water's centrally managed bulk chemical supply agreements. Once finalised, this process will be documented in the procurement procedure for chemical supply.
IPART guidance	Auditor to check for completion
Audit finding	The procedure <i>Quality Assurance of Hypochlorites, Standard Operating</i> <i>Procedure</i> (SOP) (WPIMS5175, dated 15/06/2020) has been updated to include the use of sodium hypochlorite (1%) pipe sanitiser. The procedure documents an approved supplier of the chemical and QA testing requirements.
	The procedure requires that <i>Detailed QA testing requirements will be</i> undertaken on two batches per calendar year by the supplier, Water Quality and Assurance shall audit the quality of sodium hypochlorite supplied twice annually.
	Evidence of Sydney Water QA testing was provided (dated 11/9/19). The criteria on the form is not specific to the 1% solution, with an available chlorine criterion on the form of >12.5%. A note was made on the completed QA form stating that the sample is "spray only, so is acceptable as sample is dilute". The criteria used is applicable to non-diluted samples.
	It is recommended that the criteria on the QA form reflect the requirements specific to the 1% sample.
	Evidence of a quality assurance check by the supplier had not been undertaken in the audit period.
Recommendation status	This recommendation remains open and should be checked for completion at the next operational audit. The QA form should be updated specific to the 1% solution

Recommendation 2019-02: Water Quality (Drinking water) clause

2.1.2

ltem	Detail
IPART's recommendation to the Minister	By 30 June 2020, ensure calibration records associated with the work instruction, <i>HACH 2100P Series Portable Turbidimeter – Calibration and Maintenance</i> , are appropriately maintained to demonstrate that the required calibrations are undertaken at the specified frequency as per the work instruction.
Audit findings & status	New recommendation in 2019.
	Status reported on 31 March 2020:
	Completed
	Current practice is to conduct a monthly calibration check on the instrument. Document D0001552 – <i>HACH 2100 Series Portable Turbidimeter – Calibration and Maintenance</i> has been updated and approved in the document control system to reflect current work practices and recordkeeping requirements.
	The calibration records will be available to be reviewed for the next audit.
IPART guidance	Auditor to check for completion
Audit finding	An updated Work Instruction HACH 20100 Series Portable Turbidimeter – Calibration and Maintenance was provided as evidence. The work instruction includes a monthly requirement for calibrations and that results are results of monthly checks shall be recorded on the 'Hach Turbidimeter calibration' form included as an appendix to the work instruction.
	The work instruction was viewed in BMIS and document control details confirmed (dated 14/11/19).
	A completed 'Hach Turbidimeter calibration' form was provided as evidence for the period 25/10/2019 to 4/6/2020. For each date and serial numbers results were recorded for standards <0.1 NTU, 10 NTU, 20 NTU, 100 NTU and 800 NTU with pass results (Y/N) recorded. Calibrations for instruments serial numbers were documented approximately on a monthly basis consistent with the requirements of the work instruction.
Recommendation status	Complete

Recommendation 2019-03: Water Quality (Drinking water) clause 2.1.2

ltem	Detail
IPART's recommendation to the Minister	By 30 June 2020, ensure internal key performance indicator reporting outlined in the Drinking Water Product Specifications (IMS0152.01) is undertaken as required. The following actions are to be implemented:
	• A review of the target criteria for cross-connection management in the Drinking Water Product Specifications (IMS0152.01) is to be undertaken to ensure that new and established residential property cross-connection rates are at a level that prevents unacceptable exposure (nominally 1/1000 houses).
	Appropriate monitoring of the targets must be established.
	The review must be undertaken in consultation with NSW Health.

Atom Consulting for IPART

ltem	Detail
Audit findings & status	New recommendation in 2019.
	Status reported on 31 March 2020:
	On track
	Sydney Water is currently defining the scope of the audit for cross- connection risk in relation to the role of plumbing inspectors (Office of Fair Trading)
	This matter will be discussed at the upcoming Joint Operational Group (JOG) meeting with NSW Health.
IPART guidance	Auditor to check for completion
Audit finding	The target criteria for cross connection management has been reviewed and updated in the <i>Drinking Water Specification</i> (IMS0152.01). The updated KPIs include a target criterion of '100% of new recycled water properties flow tested' and an action limit of '< 100% of new recycled water properties not flow tested' (23/4/2020, version 4).
	Evidence was provided of NSW Health satisfaction with the changes to Drinking Water Specification of email correspondence from NSW Health to Sydney Water (dated 3/4/2020).
	Evidence of monthly water quality management reports (April, May and June 2020) were provided as evidence of monitoring of targets set. The reports include a section on 'cross connection management – recycled water main to meter' which shows the number of work orders given and those completed. Sydney Water advised that a work order commenced a request for inspection to Office of Fair Trading and completion occurred on receipt of checks that the inspection had occurred.
Recommendation status	Complete

Recommendation 2019-04: Water Quality (recycled water) clause 2.2.1

ltem	Detail
IPART's recommendation to the Minister	By 31 March 2020, ensure the recycled water risk assessments are more detailed to manage risk effectively. The following actions are to be undertaken:
	 All possible modes of failure are to be assessed through the identification of hazards and hazardous events, although these may be grouped.
	• Specific actions or procedures are identified as preventive measures to ensure the measure is understood, communicated and auditable.
	 Significant risks should be clearly identified, to ensure preventive measures are in place and prioritised accordingly.
	 Areas of uncertainty are to be identified to ensure that there is continual improvement in the risk assessment process.
	These are to be implemented for the next revision of the Wollongong Stages 1 and 2 risk assessments.

ltem	Detail
Audit findings & status	New recommendation in 2019.
	Status reported on 31 March 2020:
	Completed
	Sydney Water's Enterprise Risk Management Framework outlines our approach to identify, analyse, evaluate and treat risks in accordance with the ISO 31000 standard. The framework provides standardised tools, templates and procedures to support risk management across the organisation.
	In addition, Sydney Water has developed a Recycled Water Hazard and Risk Library to ensure that recycled water risk assessments are sufficiently detailed and all possible modes of failure are considered. An uncertainty matrix is also being used in these risk assessments.
	The above tools will be utilised in the next risk assessments for the Wollongong Stage 1 and 2 recycled water schemes.
	The Wollongong Stage 1 risk assessment is scheduled for 25 March 2020. Wollongong Stage 2 recycled water schemes have commenced the verification of Log Reduction Value (LRV) monitoring program which will inform the next revision of the risk assessment.
IPART guidance	Auditor to check for completion
Audit finding	A <i>Recycled Water Risk Assessment Procedure Workshop SOP</i> (D0001681, v1 dated 16/03/2020) was developed that documents the steps outlined in the risk assessment process prior to the required date of 31 March 2020. The procedure includes an uncertainty assessment tool and includes a requirement that improvement actions identified are summarised in the risk report. A Risk and Hazard Library was developed that includes a detailed list of hazards and hazardous events across process units.
	The Wollongong Risk assessments were completed for Stage 1 in April 2020 and Stage 2 in April 2020. The risk assessment output reports state that the workshops were conducted in accordance with the 'D0001681 <i>Recycled Water Risk Assessment Workshop SOP</i> '. A summary table of actions identified in the risk assessment register is included in both reports.
Recommendation status	Complete

Recommendation 2019-05: Water Continuity Standard Clause 4.2.2

ltem	Detail	
IPART's recommendation to the Minister	⁷ 31 March 2020, Sydney Water is to complete a formal debrief (including a ot cause analysis) on the Punchbowl water main break to identify and evelop more effective monitoring arrangements to enable timely entification of operational conditions that may affect its performance gainst the Water Continuity Standard	
Audit findings & status	New recommendation in 2019.	
	Status reported on 31 March 2020:	
	Completed	
	A detailed investigation of the Punchbowl incident, using the Investigation Cause Analysis Method (ICAM), has been completed and a report with identified improvement actions prepared.	

Atom Consulting for IPART

ltem	Detail		
IPART guidance	Auditor to check for completion		
Audit finding	Sydney Water conducted an investigation of the Punchbowl incident, using the Investigation Cause Analysis Method (ICAM), to debrief on and determine the root causes of the Punchbowl incident. Sydney Water advised that this investigation was conducted in addition to a "hot debrief" performed in April 2019 and an informal post-incident review performed on 28 August 2019.		
	The ICAM investigation identified four contributing factors, two root causes and 12 lessons learned with 30 improvement actions. Among other improvement actions, Sydney Water identified multiple improvement actions relating to more effective monitoring arrangements to enable timely identification of operational conditions that may affect its performance against the water continuity standard. These improvement actions include:		
	 Reviewing high consequence of failure assets (in regards to reliability, redundancy and resistance) 		
	Reviewing the process for managing depleting reservoirs		
	Installing pressure gauges in SMART standpipes		
	Sending important alarms from SOC to the CDMs		
	 Reviewing and updating all contingency plans for assets with a high consequence of failure 		
	 Considering capital options to improve critical infrastructure resilience on this main. 		
	Sydney Water advised that the combined post-incident review and ICAM investigation report is held in its Resource Centre.		
	As evidence, Sydney Water provided to us a Board paper summarising the results of the investigation, noted at the Board meeting on 27 May 2020, and the combined post-incident review ICAM investigation report.		
	We conclude that Sydney Water has completed its required actions against this recommendation.		
Recommendation status	Complete		

Recommendation 2019-06: Environmental indicators Clause 6.2.1

ltem	Detail	
IPART's recommendation to the Minister	By 30 June 2020 Sydney Water is to amend its reporting of indicator E1 and E2 to include electricity consumption and renewable electricity generation by build-own-operate-transfer (BOOT) contractors.	
Audit findings & status	New recommendation in 2019.	
	Status reported on 31 March 2020:	
	Completed	
	Sydney Water's internal reporting manual has been amended to include the electricity consumption and renewable electricity generation data for build- own-operate-transfer (BOOT) contractors in its reporting on environmental performance indicators E1 and E2 from 2019-20.	
	Arrangements are in place to ensure that the required data is available from the BOOT plants.	

ltem	Detail		
IPART guidance	Auditor to check for completion		
Audit finding	Sydney Water advised that it has updated its internal reporting spreadsheet (Energy Reporting Master 2019-20) to include build-own-operate-transfer (BOOT) data from contractors for the purpose of reporting these two indicators. We reviewed this spreadsheet (Energy Reporting Master 2019-20 v01.1.xlsx) and confirmed that the BOOT contractor amounts have been included in a separate tab. The additional data includes four water filtration plants and one wastewater treatment plant as well as the Sydney Desalination Plant (SDP). While the SDP is not operated under a BOOT contract, it produces water that is supplied to Sydney Water and it was felt that it was appropriate to include the SDP to fully capture the electricity required by Sydney Water to deliver its services. We believe that there is merit in reporting at these indicators for electricity excluding the SDP. This is because SDP is a separate legal entity outside of the control of Sydney Water.		
	The table below shows the components of electricity usage reported for indicator E1. SDP comprises one third of the total reported and BOOT schemes comprise 5% of the total.		
	Total grid usage on energy bills at Sydney Water	377,262,267	
	Total contractor electricity usage	396,861	
	Total BOOT	30,584,832	
	SDP	198,259,035	
	Total grid usage	606,502,995	
	Sydney Water provided to us the reporting folio for energy which sets out how it has responded to this recommendation.		
Recommendation status	Complete		

Appendix A Evidence sighted

A.1. Clause 1.7 – Pricing

- Letter from the Managing Director, Sydney Water to the Chief Executive Office, IPART on 7 August 2020
- Letter from the Chief Executive Officer, IPART to the Managing Director, Sydney Water (17/414) on 3 June 2020
- Letter from the Head of Regulatory Economics, Sydney Water to the Executive Director, IPART on 26 March 2020
- Sydney Water 2019, no title (Escalated Sydney Water Prices_2019-20_SWIM 1275881.pdf), SWIM 1275881, 31 May 2019
- Letter from the Chief Executive Officer, IPART to the Managing Director, Sydney Water (19/137) on 6 May 2019
- Sydney Water 2019, *Implementing IPART determined retail prices*, SWIM 775467, Version 3, 4 June 2019
- Sydney Water n.d., Appendix 1, SWIM 789261
- Sydney Water 2019, *Annual IPART price changes & others*, SWIM 786730, Version 3, 6 August 2019
- Sydney Water 2018, *Update e-Developer Ancillary Service Charges*, BMIS D0000695, Version 3, 25 June 2018
- Sydney Water 2018, *RAS: Updating prices for products provided via Property Link*, BMIS D0000861, Version 1, 20 June 2018
- Sydney Water 2018, *RAS: Updating prices for products provided via Sydney Water Tap in*, BMIS D0000864, Version 1, 22 June 2018
- Sydney Water 2019, *Minor Service Extension price calculation and tracking*, SWIM 784887, Version 3, 6 December 2019
- Sydney Water 2019, *Recycled water developer charges calculation and tracking*, SWIM 789257, Version 3, 6 December 2019
- Sydney Water 2020, *Updating e-Developer CPI For Recycled Water Developer Charges for DSP Areas*, BMIS D0000874, Version 2, 30 January 2020
- Sydney Water 2018, *e-Developer: Create New DSP calculator for existing and new DSP Area*, BMIS D0000881, Version 1, 25 June 2018
- Reycled water developer charges_existing scheme v2.xlsx
- Reycled water developer charges_new scheme v2.xlsx

A.2. Clause 3.1 Economic approach for water conservation

- Sydney Water n.d., *Determining Sydney Water's Economic Level of Water Conservation: Part A: The ELWC Methodology*
- Sydney Water n.d., The Economic Level of Water Conservation (ELWC): Summary
- Sydney Water 2020, Water Conservation Report 2019 2020

- Sydney Water 2020, *Board paper for noting: Agenda item 2.6: Water Conservation Program*, Board meeting of 30 September 2020
- Sydney Water n.d., *Water Conservation Report 2018 2019*
- Value of Water_Dec 2019.xlsx
- Value of Water_August 2020.xlsx
- Value of Water for 2019-20 Water Conservation Program Report.xlsx
- Sydney Water n.d., *Operating Licence*, <u>https://www.sydneywater.com.au/SW/about-us/our-organisation/what-we-do/operating-licence/index.htm</u>
- [name redacted] Sydney Water Leakage Management.docx
- Water Conservation Report 2019-20_revised 26 Oct 20.pdf

A.3. Clause 3.2 Water Planning

- Letter from the Minister for Energy and Environment to the Minister for Water, Property and Housing on 19 June 2019 (DOC19/216343)
- Letter from the Minister for Energy and Environment to the Managing Director, Sydney Water on 11 July 2019 (DOC19/216343)
- Letter from the Managing Director, Sydney Water to the Minister for Energy and Environment on 25 July 2019
- NSW Government 2019, *Government Gazette of the State of New South Wales: Number 75*, ISSN 2201-7534, 12 July 2019
- Letter from the Principal Policy Advisor, Sydney Water on 29 July 2019 (Final Payment Climate Change Fund; response to Minister)
- E-mail from the Manager, Financial Analysis, Sydney Water to the Acting Team Leader Funding, DPIE on 30 July 2019 (*RE: Due 1 August 2019- Sydney Water Annual Contribution to Climate Change Fund FY1920*)
- Letter from the Minister for Energy and Utilities to the Managing Director, Sydney Water on 2 January 2019 (IRF18/6620)
- Letter from the Minister for Water, Property and Housing to the Managing Director, Sydney Water (undated) (B20/3655)

A.4. Clause 4.1 – Drinking water

- Re June 2020 Monthly fluoride report 070720.docx
- 1045159.pdf
- 12 July CD Dashboard Report June 2020.pptx
- 17042020 Overdue test since Jan 2017.xlsb.xlsx
- 200220 Sydney Water Custodian Function.pdf
- 20036308 WT8 Nepean TWTP Project Program Sept20.pdf
- 2019 Management Review Attendees (with job titles).docx
- 2019 QMS-IMS-AMS Management Review Minutes.pdf
- 2019-20 Drinking Water Product Improvement Plan JOG Q1 March 2020 Snapshot.xlsx

- 2019-20 Drinking Water Product Improvement Plan JOG Q2 May 2020_Snapshot.xlsx
- 2019-20 Drinking Water Product Improvement Plan JOG Q3 Aug 2019 Snapshot.xlsx
- 2019-20 Drinking Water Product Improvement Plan JOG Q4 Nov 2019 Snapshot.xlsx
- 2019-20 Drinking Water Product Improvement Plan June 2020_Final Master.xlsx
- 2020 Q2 SLG Minutes 16 June draft.docx
- 2020-06-11 152010.431 Automated email notification from AMD's Actions Database.msg
- 2020-08-22 Nepean Basis of Design Report_DRAFT.pdf
- 3. Annual DWQ Compliance and Performance Report 2019-20 Final.pdf
- 4. Annual RWQ Compliance and Performance Report 2019-20 Final.pdf
- 608701 QMAF0008 Controlled Documents Standard.pdf
- 7.2 Water Quality Improvement Plan update_DW dashboard slides Q2 JOG May 20.pptx
- 7.4 Fluoride Audit Action Progress Update_JOG Meeting_Aug 17 .pptx
- 800991.pdf
- A&R0005- Dialysis Chlorine notification arrangement.docx
- Access Protocol Training Slides.pptx
- Annual Drinking Water Quality Compliance and Performance Report 2018-19 .docx
- Annual System Performance Summary Report Nepean WFP 18-19 Final.pdf
- ANQM004 V33- Laboratory Services- Quality Manual.docx
- ANWI075 V16 Laboratory Services In House Training Guide.docx
- Appendix A_Briefing Paper Network WQRisk Assessment 2019 -Nepean Warragamba Orchard Hills.pdf
- APR20_Chlorination box plots Nepean p7.pdf
- AS-NZS 4020 Amendment Proposal_FOR CIRCULATION.pdf
- At 3_ Revised Schedule.docx
- Backflow Folio of Progress monthly reporting CP12.xlsx
- Backflow overdue install (version 1).xlsb.xlsx
- Backflow Potential New Customers Data.xlsx
- Backflow properties with BPG.xlsx
- BMIS0213 Drinking Water Management Manual.pdf
- BMIS0213 Drinking Water Management Manual.pdf
- BMIS0213.13 Drinking Water Policy.pdf
- BMIS0214 Product Management Improvement Framework.docx
- BMIS0214 Product Management Framework.pdf
- BMIS0249.docx
- BOO (Mac) Training Package for RWSP.pptx

Evidence sighted

- Briefing Paper- Water Quality Risk Assessment Nepean WFP Package Membrane Plant.docx
- Cascade WFP Audit 2019-10-04 final.docx
- Catchment to Customer working group meeting minutes 250719.docx
- Compass training record confirmation for DWQMS.pdf
- Compass training record confirmation for WPIMS5228.pdf
- Compass Training Record T Venturino WPIMS5228.pdf
- Compass Training Record T Venturino.pdf
- Critical instruments SOPs training record sheet Nepean WFP.pdf
- CRM 8000228472 Customer complaint 10 Wintle St The Oaks.pdf
- D0000097_update of Website daily DW Quality report draft ver 3.docx
- D0000503 Business Resilience Policy.docx
- D0000504 Business Resilience Manual.docx
- D0000506 Incident Management Procedure.docx
- D0000507 Emergency Management Procedure.docx
- D0000633 Western Water Hub Scenario Testing Plan.pdf
- D0000643 Approved List of Chemicals.pdf
- D0000685 Work Instruction for Creation of Process Flow Diagram.pdf
- D0000771 V1- Proficiency Testing Process.docx
- D0000786.02 Creating and Managing Labware Product Specification.pdf
- D0000786.02 Work Instruction for creating Labware Product Spec.docx
- D0000799 Operational Risk Assessment Workshop SOP V3 (002).docx
- D0000799 Operational Risk Assessment Workshop SOP V3.docx
- D0000866 Nepean WFP Process Flow Diagram.pdf
- D0001088 Water Quality Management Contacts.xlsx
- D0001088 Water Quality Managment Contacts List.xlsx
- D0001308 Disinfection within drinking and recycled water networks.pdf
- D0001375 Water Hub Bulk Chemicals Delivery SOP.pdf
- D0001661 Managing Water Quality Customer Complaints.pdf
- D0001667 Water Quality Management During Operational Activities .pdf
- D0001673 Alex review Mar July 2020 Final Still in training.pdf
- D0001673 Alex review Mar July 2020 Final.pdf
- D0001673 Development program for water quality scientists.pdf
- D0001673 Development Program for Water Scientist.pdf
- Daily Water Quality Monitoring Log Sheet Nepean WFP .pdf
- DD_1025065 Drinking Water Operational monitoring plan 2019-20 ver 5 Final.doc
- DD_1025750 Annual Drinking Water Quality Monitoring Plan 2019-20 Final.pdf
- DD_1025757 Attachment 1- 5 YR Drinking Water Quality Compliance Monitoring 2019-20.doc
- DD_1264736 June 2020 SW Monthly Fluoride Report to NSW Health.xlsx
- DD_1265247 June 2020 WFP Water Quality Testing Report.pdf

- DD_1273770 4th Quarterly Drinking Water Quality Monitoring Report to NSW Health 2019-20 Final.pdf
- DD_226738 Nepean Quarterly Report Final.pdf
- DD_226738 Qrtly Drinking Water Report (CCR) Q4 19-20 (Nepean).pdf
- DD_294365 June 2020 Performance Report-Western.pdf
- Desktop fluoride code compliance assessment 2019.pdf
- EC InvestigationHPHOM1.pdf
- Email RE -(Summary Internal staff only)Chlorine Ammonia Result Notification Reports for Prospect Main Delivery System 200820.msg
- Email Re 4th Quarterly Drinking Water Quality report to NSW Health 110820.docx
- Email RE E. coli exception R050 260320 Automated email notification from AMD's Actions Database.msg
- Email Re June 2020 Monthly fluoride report 070720.docx
- Email RE Positive CryptoGiardia Sample 290520.(10008853).msg
- Email RE Potentially Toxic Blue Green Biovol Exception Result for Drinking Water N42 1702202 (Labware Notification)..msg
- Email RE TC exceedance at Macarthur WFP 180719 Automated email notification from AMD's Actions Database.msg
- Email RE Total Coliforms Exception at Macarthur WFP Result for Drinking Water (Labware Notification) 180719..msg
- Email to Akzo Nobel.docx
- Example of calibration sheet for Chlorine titrator.pdf
- Final 2018 Report Catchment to Customer Mid-term review.pdf
- Fire post workshop.xlsx
- FS075 Version 13 determination of chlorine residual.pdf
- FW Request for certification to ASNZS 40202018 (1).msg
- FW Request for certification to ASNZS 40202018 (2).msg
- FW Request for certification to ASNZS 40202018 (3).msg
- FW Request for certification to ASNZS 40202018.msg
- Head of Water Quality.pdf
- Hermitage Reservoir WS0050 Ecoli Investigation Form.docx
- HOG5214 R5 On line monitoring and control_final.pdf
- HOG5215 Reporting Equipment Faults and malfunctions from IICATs.pdf
- ID_735113 Sydney Water complaints procedure.pdf
- IMS0152.01 Drinking Water Product Specification.pdf
- INC- 28261 Cross connection of rain water tanks with drinknig water supply 1-9 Allengrove Cr North Ryde.pdf
- Incident debrief cross connection at Allengrove Cr North Ryde.pdf
- IPT2005JSWC Questionnaire 2.0_Water Product Final draft.docx
- Item 7.1 Prospect DWQMP Audit.doc
- Item 7.1 Prospect DWQMP Audit_Mar20.doc
- Item 7.1 JOG paper Cascade DWQMP Audit _Nov 2019.doc

- Item 7.1 Sydney Water Drinking Water Quality Management Plan.pdf
- JOG Meeting Minutes 20 May 2019 Final.docx
- Joint Comms Protocols SWC_WaterNSW_NSW Health.docx
- JUL20_BOXES_Service reservoirs.docx
- June 2020 Performance Report-Western.pdf
- KnowRisk register Nepean Network June 2020.pdf
- KnowRisk Register Nepean WFP -June 2020.pdf
- Management Systems presentation 191113 final_PDF.pdf
- Minutes JOG meeting 06 March 2020 final draft for SLG 2.pdf
- Minutes JOG Meeting 11 November 2019 Final SLG Draft.docx
- Minutes JOG Meeting 11 November 2019 Final SLG Draft.pdf
- Minutes JOG meeting 18 May 2020 final.docx
- Minutes JOG meeting 19 August 2019 Final Draft.docx
- Monthly checklist for monitoring 2019-20.xlsx
- Monthly Water Quality Report June _Final.pdf
- MP0017 Quarterly Monitoring Report on Drinking Water Quality for NSW Health.pdf
- MP0017 ver 4 Work Instruction for Producing Quarterly Drinking Water Quality Monitoring Reports to NSW Health.docx
- MP0023 Preparation of the quarterly report.pdf
- MP0023 Work Instruction for Preparation of the Quarterly Drinking Water report.docx
- MS Visio File Process Flow Diagram Nepean WFP_Field Verified_Updated 14-10-19.pdf
- Nepean Delivery System Process Flow Diagram.pdf
- Nepean Disinfection Review 2020.pdf
- Nepean Investigation Final Report June 2020.docx
- Nepean WFP Filter Turbidity calibration.pdf
- Nepean WFP Lab Turbidity calibration.pdf
- Nepean WFP Package Membrane Filtration Plant.pptx
- Nepean WFP 10 yr review 2009-2019.docx
- Nepean WFP Concept Design_Variation BC_v5_21 Oct.pdf
- Nepean WFP document list.png
- Nepean WFP KnowRisk Report.xls
- Nepean WFP operational risk assesssment attendance sheet_signed.pdf
- Nepean WFP Package Plant DABC Approved 190827.pdf
- Nitrification Charts Delivery System 13_JUL20.pdf
- OCS5002 Auditing of Water Filtration Plant management systems for compliance to the NSW Code of Practice.pdf
- Operational Risk Assessment 2018 Final Report Nepean WFP.pdf
- PB re Health concerns SW Risk matrix 18 & 20 Nov 2019.pdf

- Position Desc_Head of Water Quality.pdf
- Production Water Quality Scientist advertised position.pdf
- QEM-SWC-Suez DWQ Audit Report 2020-02-04.docx
- Quality Assurance SOP Training Record.pdf
- RE High level desktop fluoride audit.msg
- RE Quarter 4 1920 Water analysis has been endorsed.msg
- Report review Signature page_Q4 2019-20 Final.doc
- report_360609.pdf
- report_360613.pdf
- report_360615.pdf
- Res Zone Pop'n Est 2016 updated ABS 2018- Apr 2019.xls
- RFWG Outcomes Summary Report RevC.pdf
- Risk Assessment Fluoride dosing start signal.xlsx
- Risk Assessment_WT0008CN009.xlsm
- Risk matrix slides C2C working group ongoing for review.pptx
- Safety ICAM report.pdf
- Scott D_compass records.png
- SDIMS0010.docx
- SDIMS0011.docx
- SDIMS0012 Management Review.docx
- SDIMS0017 Records Management.pdf
- SDIMS0054 WNSW-SW Operational Protocols.pdf
- Sit Rep1 Warragamba Dam Raw Water Quality Incident.pdf
- Summary report for 1-9 Allengrove Cres. North Ryde.pdf
- SW risk matrix slides starter pack for NSW Health discussion.pptx
- SWC New Organisation Structure.pdf
- SWIM file 1025835 Minutes JOG meeting 19 August 2019 Final Draft (pg 13).docx
- SWIM file 1277046 2019-20 Drinking Water Product Improvement Plan June 2020_Final Master .xlsx
- SWIM file 1278440 Sydney Water Annual Compliance and Performance Reports 2019-20.msg
- SWIRL INC-30175 Warragamba Dam Raw Water Quality Incident.pdf
- SWIRL INC 29853 Ecoli positive in Hermitage reservoir WS0050.pdf
- Sydney Water Drinking Water Quality Management Plan Highlights_CD.pptx
- Unified monthlyreport June 2020LO.pdf
- Water Quality awareness training records from Compass July Dec 2019.xlsx
- Water Quality Incident Record INC-30933 E. coli detected in routine bulk water sample at HPHOM1 has been created 12June20.msg
- Water Quality Risk Assessment Action Implementation rev 2.docx
- Water Quality Risk Register Nepean WFP Package Membrane Plant Final.xlsx
- WOQ5012 v10 Use of the Limnos Actions Database.docx

- WPIMS5228 Drinking Water Quality Event Management Plan.docx
- WPIMS5228 Drinking Water Event Management.pdf
- WPIMS5274 Triggers, Notifications & Actions for Adverse WQ Results.docx
- WPIMS5274 Triggers, notifications & Actions for adverse WQ Results.pdf
- WT0008 All_PMs.xlsx
- WT5230 Lab equipment procedure.docx
- WT5232 Quality Assurance of Bulk Chemicals.pdf
- WTNE5006.01 Daily water quality monitoring sheet.xlsx
- WTNE5019 training record.pdf
- WTNE5019 Nepean WFP Process Specification.pdf
- WTNE5033 Master equipment calibration list.pdf
- WTNE5033.xls
- WTNR5019.01_ProMinent DACa Online Fluoride Concentration Meter.docx
- WWH Chemical Delivery SOP Training Record.pdf
- D0000799 Operational Risk Assessment SOP_V4.0_Draft.docx
- D0001088 review frequency.JPG
- D0001088 V5.xlsx
- Revised SOP Operational Risk Assessment NSW Health approval.msg
- Risk Review Report 2020 for WFPs_with comments of changes .xlsx

A.5. Clause 4.2 – Recycled water

- 1010793 West Camden Irrigation Scheme Monthly Performance Report 2019-20.pdf
- 1016836 Annual RWQ Compliance and Performance Report 2018-19 Final.docx
- 1030153 Quarterly recycled water quality monitoring report for NSW Health 19-20 1st Quarter.pdf
- 1051076 Quarterly recycled water quality monitoring report for NSW Health 19-20 2nd Quarter.pdf
- 1063516 Sydney Water Annual Report 2018-2019.pdf
- 1160725 Liverpool Risk Assessment Report.pdf
- 1251170 Quarterly recycled water quality monitoring report for NSW Health 19-20 3rd Quarter.pdf
- 1272462 2019-20 Recycled Water Monitoring Plan.doc
- 1273828 Quarterly Recycled Water Quality Monitoring Report for NSW Health 2019-20 4th Quarter FINAL.pdf
- 1274140 Elizabeth Macarthur Supply Scheme Quarterly Client Report Q4 2019-20.pdf
- 1275840 Review of RWQMPs Schedule and Progress.xlsx
- 1277047 2019-20 Recycled Water Product Improvement Plan 30 June 2020_Final.xlsx
- 1277187 Training Package West Camden RWQMP training presentation.pptx

- 2019 West Camden Sodium Bisulphite HRL report # 19-0975-10.pdf
- 2020 Composite NaOCl HRL report # 20-0488-14.pdf
- 2020 West Camden NaOCl HRL report # 20-0141-12.pdf
- 528738 West Camden Risk Assessment Report.pdf
- 614607 Risk Assessment Report- Liverpool FINAL.pdf
- 618953 Management Review.pdf
- 734434- Contribution and Development Planning and Review Policy.pdf
- 735113 Sydney Water complaints procedure.pdf
- 773507 Wastewater Treatment Plant Compliance and Operational Monitoring Plan 2018_2020.pdf
- 778440 West Camden WRP Process Flow Diagram.pdf
- 819910 Enterprise Risk Management Framework Manual.pdf
- A0000511 St Marys WRP audit report.docx
- ACP0026- Sewage Code of Australia.pdf
- ACP0028- Water Supply Code of Australia.pdf
- ACP0166- Supplement to the WSA 201 Manual for Selection and Application of Protective Coatings.pdf
- Annual Management Review Presentation 131119.pdf
- BMIS0209- Technical Specification- Mechanical.pdf
- BMIS0214 Product Management Improvement Framework.docx
- BMIS0260 Recycled Water Management Manual.pdf
- BMIS0260.01 Recycled Water Management Policy.pdf
- Calibration Certificate West Camden WRP FTX8280.pdf
- Calibration report West Camden Free chlorine.pdf
- Camden Council Hayter Reserve RW Meeting December 2019.pdf
- Camden Council Hayter Reserve RW Meeting June 2020.pdf
- Camden Council Ron Dine Reserve RW Meeting December 2019.pdf
- Camden Council Ron Dine Reserve RW Meeting June 2020.pdf
- Camden Council RW Agreement Annual Declaration 2019-2020.pdf
- Completed IMS audits in 2019-20.xlsx
- Completed lab sheet West Camden Liquids Nov 19.pdf
- Completed workflow log sheet West Camden Liquids Workflow Nov 19.pdf
- CPDMS0023- Technical Specification- Civil.pdf
- CRM 8000252432 complaint in Recycled Water scheme.pdf
- CRM 800054548 Discoloured recycled Water complaint.pdf
- D0000096 Recycled Water Product Specifications.docx
- D0000506 Incident Management Procedure.docx
- D0000507 Emergency Management Procedure.docx
- D0000508.01 Crisis Management Guide.docx
- D0000643 Approved List of Chemicals in Sydney Water and Change Management Process.docx

- D0000685 Work Instruction for Creation of Process Flow Diagrams.docx
- D0000692 Performance Indicators Report.docx
- D0001088 Water Quality Management Contacts.xlsx
- D0001178 West Camden WRP Process Specification.docx
- D0001222 Treatment Plants Common Incident Response Manual.docx
- D0001222.10 West Camden Incident Response Manual.docx
- D0001287 West Camden WRP- Plant Operations Manual.docx
- D0001344 Production Common Laboratory Methods and Analysis Manual.docx
- D0001344.03 Camden Wollondilly Hub Sampling and Analysis.docx
- D0001536 Liverpool WRP- Process Flow Diagram.pdf
- D0001661 Managing Water Quality Customer Complaints.pdf
- D0001673 Competency review (AlexQ) Mar July 2020.pdf
- D0001673 Development program for water quality scientists.pdf
- D0001681- Recycled Water Risk Assessment Workshop SOP.docx
- D0001682 Recycled Water Hazard and Risk Library.xlsx
- D0001768 Camden Wollondilly Hub Online Instrument Calibration SOP.docx
- DOC0154 West Camden WRP Liquid Steam Readings Plant Monitoring Workflow.doc
- DOC0154.01 West Camden WRP Liquid Stream Readings Plant Monitoring Workflow Logsheet.xlsx
- DOC0327 MD&R Annual Reporting to EPA and IPART.docx
- DOC0400 West Camden WRP Bulk Chemical Delivery SOP.doc
- Elizabeth Macarthur Agricultural Institute signed meeting form 2020.pdf
- Email 200327 OFT Response FW 48 Saltwater Crescent Nth Kellyville cross connection.msg
- Email Example EKAMS Exceedance 210520.pdf
- Email RE Training course background material 25082020.msg
- Email Sydney Water Annual Compliance and Performance Reports 300919.pdf
- Email Updating Water Quality Management Contacts.pdf
- E-Training Package Recycled Water Quality Event Management Plan.pdf
- IMS Monthly Report 2020 07 01.xlsm
- IMS0038 Treatment Plant Operational Change Management.docx
- INC 29728 WQ HAZ Unmetered recycled water service 4 Meadowsland Ave -Bella Vista.pdf
- Investigation 48 Saltwater Cres North Kellyville INC-29805 report.pdf
- IWES course certificate Recycled Water Management Business Customer Representative.pdf
- IWES Recycled Water Management certificate Andrew Peters WQS.pdf
- IWES Recycled Water Management certificate Andrew Peters.pdf
- JIRA-SPE 661 WC RW Improvements 120720.jpg

- Lab calibration records West Camden Nov 19.pdf
- MAXIMO work order example for plant assets for preventative maintenance West Camden WRP.pdf
- MP0021 Preparation of the Recycled Water Quarterly Reports.docx
- NWPTRT052 Fillable Combined Assessment Tool Hypochlorite disinfection.pdf
- NWPTRT052 Fillable Combined Assessment Tool.pdf
- NWPTRT052_LR_OC Hypochlorite disinfection for Sydney Water June 2020.pdf
- Plant Modification Request Form RW Interlocks 020720.pdf
- Plant Modification Request Form RW Interlocks Risk Assessment 020720.xlsx
- Position Description Business Customer Representative.pdf
- Position Description Process Controller.pdf
- Position Description Process Manager.pdf
- Position Description Production Manager.pdf
- Position Description Production Officer.pdf
- Positon Description Senior Process Engineer.pdf
- Process Meeting Minutes West Camden WRP 21 November 2019.pdf
- Production Capability Development Guide Product Quality.docx
- QMAF0008 Controlled Documents Standard.pdf
- QMAF0021 Operational Risk Assessment Technical Requirement.docx
- QMAF0081 Guideline A Risk management process.pdf
- Qualification TAFE Water Operations Certificate Business Customer Representative.pdf
- SCADA screenshot RW CCP interlocks active West Camden.jpg
- SCADA screenshot RW CCP limits West Camden.jpg
- SCADA screenshot RW CCP monitoring West Camden.jpg
- Scenario Test West Camden May 2020.pdf
- SDIMS0010 Performance Monitoring (Audit or Inspections).docx
- SDIMS0010.docx
- SDIMS0017 Records Management.docx
- ST0028RPZ3329 test certificate.pdf
- ST0028RPZ3346 test certificate.pdf
- ST0028RPZ3347 test certificate.pdf
- ST0028RPZ66M9 test certificate.pdf
- ST0028RPZ7623 test certificate.pdf
- ST0028RPZ9609 test certificate.pdf
- ST0028RPZ9614 test certificate.pdf
- SWIRL INC 29805 Cross connection 48 Saltwater Cr North Kellyville.pdf
- Technical Capability FAQ_General_Nov 2019.docx
- TO0021 Biological Nutrient Removal UPG.docx
- Training Package Camden Wollondilly Hub Recycled Water Overview.pptx

- Training record Camden Wollondilly Hub Recycled Water Overview West Camden.pdf
- Training record Camden Wollondilly Hub Sampling & Analysis SOP West Camden.pdf
- Training record Process Specification West Camden.pdf
- Training Record Production Common Laboratory Methods and Analysis Manual West Camden.pdf
- Training Records Common Incident Response Manual West Camden.pdf
- Training Records Compass Recycled Water Quality Event Management Plan.xlsx
- Training Records Compass RWQMP West Camden.xlsx
- Training Records Compass Suchitha Sindhe.pdf
- Unified Customer monthly report May 2020.xlsm
- Unified monthlyreport May 2020LO.xlsm
- Water product Update JOG May Q2.pdf
- Water Quality Improvement Plan update_DW and RW dashboard slides Q2 JOG May 20.pptx
- West Camden Risk Report.xlsx
- WPIMS5015 Memorandum of Understanding with NSW Health.pdf
- WQ0003 Recycled Water Quality Management Plan Llverpool.docx
- WQ0006 Recycled Water Quality Management Plan West Camden.docx
- WR5271 Recycled Water Quality Event Management Plan.docx
- WRHQ5050 Notification of Plant Recycled Water Production Interruptions.docx
- WWNW0001 West Camden OIP.doc
- BMIS_MP0021_cover page.PNG
- D0001222.35.docx
- DC-TOHQ0015.docx
- email re Recycle Water Supply.msg
- General Duties Checksheet redit Nov 19.doc
- MA&I Training Plan Skills Matrix 2019-20.xlsx
- MP0021.docx
- Readings Checksheet Nov 19.doc
- Recycled Water CCP Management.docx
- St Marys training records 270520 nonconforming RW.pdf
- St Marys training records 270520 RWQMP.pdf
- Wianamatta Hub daily minutes 230920.docx
- WQ0008.docx
- WR5271.docx
- WRHQ5050.docx
- •

A.6. Clause 5.1 – Water Continuity Standard

- Maximo All Unplanned Water Interruption 20082020.xlsx
- Sydney Water 2020, *Network Performance Report*, June 2020
- Sydney Water n.d., Operating Licence 2019-23 Compliance and Performance report: System Performance Standards Report 2019-20
- Sydney Water 2020, Maintenance Crew ClickMobile Work Instructions, Version 1
- Sydney Water 2020, *Performance Indicator Sheet: PS 1 Water Continuity Standard OL 5.1.1 - Number of properties that experience an unplanned water interruption exceeding 5 hours*, SWIM 1278037, Version 1, 1 August 2020

A.7. Clause 5.2 – Water Pressure Standard

- Sydney Water 2015, *Water pressure customer complaint management process*, DOC0333.03, Version 1, 21 October 2015
- Sydney Water 2020, *SDIMS Work Instruction for Investigation and Reporting Water Pressure Failure*, DOC0333, Version 2, 10 January 2020
- Sydney Water 2020, *Performance Indicator Sheet: PS 2 Water Pressure Standard OL 5.2.1 Number of properties that experience 12 or more water pressure failure events*, SWIM 1278038, Version 1, 1 August 2020
- Sydney Water 2019, *Compiling Water Pressure Failure Data in Table2*, DOC0333.04, Issue 1
- Watermain Asset Management Plan, AMQ0049
- Water System Planning Guideline, AMQ0562
- Standard PRV Contingency Plan, D0001149
- Above Ground Pipeline Decision Framework AMQ0136
- Critical Water Main Renewal Decision Framework, AMQ0035
- Reticulation Water Main Renewal Decision Framework, AMQ0100
- Sydney Water, 2019, Bonding of Works Policy, ACDP0143

A.8. Clause 5.3 – Dry Weather Wastewater Overflow Standard

- Maximo All Wastewater Overflow Impacted Properties Report 20082020.xlsx
- Sydney Water 2020, *iConnect Wastewater Monthly Report*, June 2020
- Sydney Water n.d., Operating Licence 2019-23 Compliance and Performance report: System Performance Standards Report 2019-20
- Sydney Water 2020, PS 3 Dry Weather Wastewater Overflow Standards OL 5.3.1 (a) Number of properties (excluding public properties) that experience an uncontrolled sewage overflow; PS 3 Dry Weather Wastewater Overflow Standards OL 5.3.1 (b) Number of properties (excluding public properties) that experience 3 or more uncontrolled sewage overflow, SWIM 1278039, Version 1, 1 August 2020

A.9. Clause 5.5 – Asset Management

• Sydney Water 2017, *Asset Management Policy*, AMQ0033, Version 3, 25 September 2017
- Sydney Water 2019, *Strategic Asset Management Plan*, BMIS D0000876, Version 3, 6 March 2019
- Sydney Water 2017, *Terms of Reference: Product and Asset Leadership Group*, BMIS D0000676, 1 October 2017
- Sydney Water 2017, *Terms of Reference: Asset Management Forum*, BMIS D0000675, 1 October 2017
- Sydney Water 2019, Agenda: Asset Management Forum, 25 September 2019
- Sydney Water 2019, Agenda: Product and Asset Leadership Group, 2 October 2019
- Sydney Water n.d., *Executive MOS Item for Approval: Asset Management Maturity Assessment*
- Letter from the Head of Service Planning and Asset Strategy, Sydney Water to Heads of Business accountable for asset management functions, undated
- BSI 2020, Assessment Report: Sydney Water Corporation, A0000626, undated
- Sydney Water 2019, Audit summary: A0000564, 4 December 2019
- Sydney Water 2019, *Audit summary: A0000565*, 10 December 2019
- Sydney Water 2019, *Audit summary: A0000569*, 9 December 2019
- Sydney Water 2019, *Audit summary: A0000570*, 5 December 2019
- Sydney Water 2019, Audit summary: A0000571, 12 December 2019
- Sydney Water 2019, Asset Management System (AMS) Annual Management Review: 1 July 2018 – 31 October 2019, BMIS D0001121, November 2019
- Sydney Water 2019, Asset Master Plan: Wastewater Pumping Stations, Low Pressure Sewerage Systems and Vacuum Sewerage Systems, AMQ0021, Version 4
- Sydney Water 2019, Sewage Pump Stations, Vacuum Sewerage Systems and Low-Pressure Sewerage Systems Consequence of Failure Assessment, BMIS D0001090, Version 2
- D0001090 Appendix B SPS Condition and Risk Rating.xlsx
- SPS Inspection Program 2018 2022.xlsx
- Sydney Water 2020, SASTTI Inspection Schedule, 7765A, Version 2, 6 April 2020
- Letter from the Head of Wastewater and Environment, Sydney Water to the Manager Regulatory Operations Metropolitan South, Environment Protection Authority on 18 September 2020
- 7678.20.02 SP0004 Annandale CA v1.pdf
- 7678.20.05 SP0007 Rozelle CA v1.0.pdf
- 7678.20.10 SP0016 The Rocks CA v1.0.pdf
- Audit response_ SPS.pdf
- Phase 1 Level 2 CBAV Grad 4.pdf
- Phase 1 Level 2 CBAV Grad 5.pdf
- •

A.10. Clause 6.4 – Assistance Options for Payment Difficulties and Actions for Non-Payment

• Agenda order onboarding training.xlsx

- Timetable for training
- Compass training record.pdf
- SWIM 447786 Payment Assistance Policy pdf
- SWIM 272216 Payment Assistance Scheme Procedure pdf
- Internal how to help customers in hardship pdf
- What you need to know flyer pdf
- PAS Assessment Checklist 2019 pdf
- Help with your bill page on website (weblink provided)
- PAS information for Agencies pdf
- SWIM 753789 Overdue Payments Policy pdf
- SWIM 158223 Overdue Payments Procedure pdf
- Changes to policies in line with new Customer Contract pdf

A.11. Clause 6.5 – Family Violence

- BillAssist case management and review procedure last updated 0420.pdf
- Domestic Violence Case Study.docx
- PD Customer Care Case coordinator.pdf
- Screen shot of DV Policy on SW website.pdf
- SWIM ID 1117163 Family Violence Assistance Policy.pdf

A.12. Clause 8.1 – Negotiations with WIC Act licensees and Potential Competitors

- Manage Competition Business Process Area Diagram, Helix
- Notice of a WIC Licensee Application, Assess need to respond form was viewed (Ver 1, 17/9/2019)
- Demonstration of system processes

A.13. Clause 8.3 – Code of conduct

- Code of conduct, Wilton Recycled Water Scheme at Bingara Gorge (11018, 10/10/13)
- Utilities services agreement, Barangaroo (150626)
- Demonstration of system processes

A.14. Clause 10.2 – Reporting

- 189255 SW Records Management Policy.pdf
- 608701 Controlled documents Standard.pdf
- D0000692 V2 Performance Indicators Reporting.docx
- Evidence -Quarterly reports on Website 2019-20.docx
- SWIM System IConnect page.pdf
- 7.4 Fluoride Audit Action Progress Update_JOG Meeting_Aug 17 .pptx

- DD_1273770 4th Quarterly Drinking Water Quality Monitoring Report to NSW Health 2019-20 Final.pdf
- Desktop fluoride code compliance assessment 2019.pdf
- OCS5002 Auditing of Water Filtration Plant management systems for compliance to the NSW Code of Practice.pdf
- RE High level desktop fluoride audit.msg
- Thumbs.db
- 3. Annual DWQ Compliance and Performance Report 2019-20 Final.pdf
- 4. Annual RWQ Compliance and Performance Report 2019-20 Final.pdf
- Annual Drinking Water Quality Compliance and Performance Report 2018-19 .docx
- BMIS0213 Drinking Water Management Manual.pdf
- Catchment to Customer working group meeting minutes 250719.docx
- SDIMS0010.docx
- SDIMS0011.docx
- SWIM file 1025835 Minutes JOG meeting 19 August 2019 Final Draft (pg 13).docx
- SWIM file 1278440 Sydney Water Annual Compliance and Performance Reports 2019-20.msg
- Audit response- Reporting-Doc Control.docx
- D0000676-Updated PALG ToR-2020.docx
- BMIS_MP0021_cover page.PNG
- D0001222.35.docx
- DC-TOHQ0015.docx
- email re Recycle Water Supply.msg
- General Duties Checksheet redit Nov 19.doc
- MA&I Training Plan Skills Matrix 2019-20.xlsx
- MP0021.docx
- Readings Checksheet Nov 19.doc
- Recycled Water CCP Management.docx
- St Marys training records 270520 nonconforming RW.pdf
- St Marys training records 270520 RWQMP.pdf
- Wianamatta Hub daily minutes 230920.docx
- WQ0008.docx
- WR5271.docx
- WRHQ5050.docx
- Water Pressure response v2.docx

A.15. Previous Recommendations

- Sydney Water 2020, *Agenda item 5.1: Punchbowl ICAM Review*, Board meeting of 27 May 2020
- Sydney Water 2020, Incident debrief and ICAM

- QA 1% Hypochlorite.pdf
- WPIMS5175. Quality Assurance Hypochlorites.pdf
- D0001552 HACH 2100 Series Portable Turbidimeter -Calibration and Maintenance.pdf
- Hach 2100 Turbidity calibration sheet.pdf
- IMS0152.01 Drinking Water Product Specification.docx
- NSW Health response to product specification changes.pdf
- SWIM file 1252411 Monthly Water Quality Management Report April.pdf
- SWIM file 1259874 Monthly Water Quality Management Report May.pdf
- SWIM file 1266045 Monthly Water Quality Management Report June.pdf
- IPT2005JSWC Questionnaire 2.0_Recycled Water Master Copy_Final Draft.docx
- 1256476 Risk Assessment Report Wollongong Stage 1 Recycled Water scheme.pdf
- 1272542 Risk Assessment Report Wollongong Stage 2 Recycled Water scheme.pdf
- D0001681- Recycled Water Risk Assessment Workshop SOP.docx
- D0001682 Recycled Water Hazard and Risk Library.xlsx

E Report on clauses audited by IPART – Sydney Water

Operating		Compliance Grade
Licence	Clause	Compliance Grade
1.2.2	Sydney Water must publish on its website a map of its Area of Operations by 31 December 2019 (or another date approved by IPART in writing). Sydney Water must update the map within 30 days of any change to its Area of Operations.	S
1.6.1	Sydney Water must make a copy of this Licence available to any person, free of charge: on its website; and upon request made to the Contact Centre.	
3.1.3	 Sydney Water must make: a) a copy of the Current Economic Method; b) a plain English summary of the Current Economic Method; and c) the economic level of water conservation (expressed as the value of water in dollars per kilolitre and as the quantity of savings in megalitres per day) determined in accordance with the Current Economic Method, available: d) to any person, free of charge upon request made to the Contact Centre; and e) on Sydney Water's website. 	
3.2.6	Sydney Water must develop and enter into a data sharing agreement with DPE by the Commencement Date (or another date approved by the Minister in writing) to assist in the development and review of the Metropolitan Water Plan (the Data Sharing Agreement)	S
3.2.7	 In addition to any other matters agreed by Sydney Water and DPE, the Data Sharing Agreement must: a) set out the roles and responsibilities of Sydney Water and DPE under the Data Sharing Agreement; b) set out the types of data that are covered by the Data Sharing Agreement; c) set out the purposes for the sharing of data and information; d) set out the requirements that shared data and information must meet; e) identify agreed timelines and the format for sharing data and information; and f) identify procedures for resolving matters of conflict in providing data and information. 	
3.2.8	Once Sydney Water has entered into the Data Sharing Agreement it must comply with the Data Sharing Agreement.	
6.1.2	Sydney Water must make a copy of the Customer Contract available to any person, free of charge: a) on its website; and b) upon request made to the Contact Centre.	
6.6.6	Sydney Water must report to IPART on the completed review and its outcomes by 30 June 2020 (or another date approved by IPART in writing).	
6.7.4	Sydney Water must make the information concerning internal Complaints handling referred to in clause 6.7.3 available to any person, free of charge:	

Table E.1 Audit findings for "IPART to Check" clauses

Operating Licence	Clause	Compliance Grade
	a) on its website; andb) upon request made to the Contact Centre.	
6.8.1	Sydney Water must be a member of the Energy & Water Ombudsman NSW to facilitate the resolution of disputes between Sydney Water and its Customers and Consumers.	
10.1.1	 Sydney Water must cooperate with an audit undertaken by IPART or an Auditor of Sydney Water's compliance with any of the following: a) this Licence (including the Customer Contract); b) the Reporting Manual; and c) any matters specified by the Minister, (the Operational 	
10.1.2	Audit). For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must, within a reasonable period of receiving a request from IPART or an Auditor, provide IPART or the Auditor with all the information in Sydney Water's possession, custody or control that is necessary to conduct the Operational Audit, including any information that is reasonably requested by IPART or an Auditor.	
10.1.3	 For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must permit IPART or the Auditor to: a) access any works, premises or offices occupied by Sydney Water; b) carry out inspections, measurements and tests on, or in relation to, any such works, premises or offices; c) take on to any such premises or offices any person or equipment necessary for the purpose of performing the Operational Audit; d) inspect and make copies of, and take extracts from, any books and records of Sydney Water that are maintained in relation to the performance of Sydney Water's obligations under this Licence (including the Reporting Manual); and e) discuss matters relevant to the Operational Audit or any report on the Operational Audit with Sydney Water, including Sydney Water's officers and employees. 	
10.3.1	Sydney Water must provide IPART information relating to the performance of any of Sydney Water's obligations under clause 10.2 (including providing IPART physical and electronic access to the records required to be kept under clause 10.2) within a reasonable time of Sydney Water's receiving a request from IPART for that information.	
10.3.2	Sydney Water must provide IPART such information as is reasonably required to enable IPART to conduct any review or investigation of Sydney Water's obligations under this Licence within a reasonable time of Sydney Water receiving a request from IPART for that information.	

Operating Licence	Clause	Compliance Grade
10.3.3	If Sydney Water engages any person (including a subsidiary) to undertake any activities on its behalf, it must take all reasonable steps to ensure that, if required by IPART or an Auditor, any such persons provide information and do the things specified in clause 10.1 as if that person were Sydney Water.	
10.3.4	If IPART or an Auditor requests information that is confidential, the information must be provided to IPART or the Auditor, subject to IPART or the Auditor entering into reasonable arrangements to ensure that the information remains confidential.	
10.3.5	Sydney Water must provide NSW Health with information relating to water quality in the manner and form specified by NSW Health within a reasonable time of receiving NSW Health's request.	
	[Note: Under section 19 of the Public Health Act 2010 (NSW), the Secretary of NSW Health may require Sydney Water to produce certain information.]	

F Sydney Water's statement of compliance



Statement of Compliance 2020

For 2019/20

Submitted by Sydney Water

To: The Chief Executive Officer Independent Pricing and Regulatory Tribunal of NSW PO Box K35 Haymarket Post Shop NSW 1240

Sydney Water Corporation reports as follows:

- 1. This statement documents compliance during 2019-20 with all obligations to which Sydney Water Corporation is subject by virtue of its Operating Licence.
- 2. This report has been prepared by Sydney Water Corporation with all due care and skill, including to ensure that all information provided is true and correct, in full knowledge of conditions to which Sydney Water Corporation is subject under the *Sydney Water Act 1994*.
- 3. Schedule A provides information on all obligations with which Sydney Water Corporation did not comply during 2019-20.
- 4. Other than the information provided in Schedule A, Sydney Water Corporation has complied with all conditions to which it is subject.
- 5. The compliance reports have been approved by the Managing Director and the Chairman of the Board of Directors of Sydney Water Corporation.

DATE:	01/09/2020	DATE:	01/09/2020
Signed:	Millie	Signed:	Enuce ho gas
Name:	Roch Cheroux	Name:	Bruce Morgan
Designation:	Managing Director	Designation:	Chairman



Schedule A - Non Compliances 2019-20

5.1.1 Water Continuity Standard

Sydney Water must ensure that, in each financial year, at least 9,800 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service unaffected by an Unplanned Water Interruption

(the Water Continuity Standard).

i. Date or period of non-compliance

1 July 2019 - 31 June 2020

ii. Nature and extent of non-compliance (including whether and how many customers have been affected)

In 2019-20, there were 48,550 properties impacted by Unplanned Water Interruptions. This equates to 9,763 Properties / 10,000 Properties unaffected by an Unplanned Water Interruption, and outside of the water continuity standard requirement of at least 9,800 Properties / 10,000 Properties unaffected by an Unplanned Water Interruption.

iii. Results of any monitoring (where applicable)

Not applicable

iv. Reasons for non-compliance

Sydney has been experiencing hot and dry weather conditions over the past three years. This dry weather exacerbates soil movement, leading to an increase in water main breaks and leaks. There has been an increase in the number of breaks on large mains that have been complex to repair and difficult to arrange alternative water supply, resulting in a large number of properties being affected for long periods. These high impact breaks cannot currently be predicted, and our ability to respond, isolate and re-route water supply in these cases has a significant impact on our water continuity performance.

The total number of breaks and leaks rose during 2019-20 compared to 2018-19, with an increased proportion of breaks/leaks that took longer than five hours to repair. There was a noticeable non-linear progression where the first half of the year saw a much higher number of breaks but was evened out by lower numbers post February 2020, primarily due to the breaking of the drought at that time. Two large breaks on critical water mains accounted for around 10,000 properties or 25 percent of the total number of properties reported for the Water Continuity Standard.

A contributing factor to unplanned interruptions is temporary operational changes to system configuration (such as temporary rezoning) that result in pressure fluctuations in the system. These can in turn lead to additional water main breaks in the same area thus impacting larger numbers of properties with interruptions greater than five hours. Several of these events occurred in 2019-20, where changes in system dynamics resulted in a small ripple of breaks. Sydney Water is continuing to develop advanced analysis tools to better monitor fluctuations in pressure or increases in pressure above the normal operating window to reduce the impact and likelihood of these water main breaks in the future.



v. Remedial action taken

Hydrant and Mains Wizard – new technology

Sydney Water has begun using new technology (Hydrant Wizard and Mains Wizard) that enable us to perform repairs on live assets (<=200mm diameter), reducing the number of properties impacted by water interruptions as no shutdown is required. This process has been under development over the past year. A new group of specialised teams is being set up to further enable the number of repairs performed on live assets. We estimate that around 5,000 properties had an interruption avoided in 2019-20 as a result of these methods, where the duration would likely have exceeded five hours if repairs were undertaken with standard techniques.

Criteria Based Assessment and Prioritisation

Our water mains renewal program aims to minimise the occurrence of water main breaks by targeting areas where water mains have had recurrent failures. While other criteria also affect the renewals program, discontinuity performance and the impact on customers is a significant driver in the decision framework for water main renewal. After the identification of poorly performing mains, amongst other things, the program is prioritised by:

- an analysis of the supply criticality for the customers impacted
- the cost of renewing the main against the ongoing cost of maintenance
- the occurrence of multiple disruptions
- the extent to which the renewal will improve service levels to the greatest number of customers.

Reactive Response (Unplanned Interruptions)

Sydney Water's Customer Hub undertakes a Customer Impact Assessment (CIA) for each reactive water leak or break reported by the customer or picked up through online monitoring, that may result in a water interruption to effect repair. This is used to determine what appropriate mitigation measures may be put in place to minimise discontinuity of service to customers, such as rezoning, use of mains or hydrant wizard or planning the interruption following scoping for low priority faults.

Planned Interruptions (and Warned)

When it is determined that a shutdown is required for maintenance or adjustments to the network, customers are notified in advance in accordance with the requirements of the Customer Contract. Work practices are tailored to the particular site conditions in order that the duration of any discontinuity event is kept to a minimum. For customers where the continuation of water supply is critical, all practical measures including the provision of a temporary supply or the undertaking of the task at a more mutually acceptable time, are implemented.

vi. Actual/anticipated date of achieving compliance

The Water Continuity Standard is a threshold limit for a financial year. Sydney Water aims to meet the performance standard on a continual basis, and while we taking proactive steps to do this, the exceptional conditions in 2019-20 made this a significant challenge to achieve.

End Notes

ⁱ See Division 2 of Part 6 of the Sydney Water Act 1994.
 ⁱⁱ Metropolitan Water, 2017 Metropolitan Water Plan, March 2017, accessed here.

iii Sydney Water Reporting Manual Operating Licence 2019-2023, November 2019, available on our website (https://www.ipart.nsw.gov.au).

iv IPART, Sydney Water Corporation 2019 Operational Audit - Report to the Minister, December 2019.