IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Hunter Water Corporation Operational Audit 2016-17

Report to the Minister

Compliance Report
Water

March 2018

ISBN 978-1-76049-178-9

The Independent Pricing and Regulatory Tribunal (IPART)

IPART provides independent regulatory decisions and advice to protect the ongoing interests of the consumers, taxpayers and citizens of NSW. IPART's independence is underpinned by an Act of Parliament. Further information on IPART can be obtained from IPART's website: https://www.ipart.nsw.gov.au/Home.

Tribunal Members

The Tribunal members for this review are:

Dr Peter J Boxall AO, Chair

Mr Ed Willett

Ms Deborah Cope

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

Erin Cini	(02) 9113 7778
Robert Aposhian	(02) 9290 8406
Gudny Palsdottir	(02) 9113 7709

Contents

Summary

The Independent Pricing and Regulatory Tribunal of New South Wales (IPART) has completed the fifth operational audit (the audit) of Hunter Water Corporation's (Hunter Water's) compliance with the requirements of its 2012-2017 Operating Licence (the licence). This audit covers the period from 1 July 2016 to 30 June 2017 (2016-17). We engaged a specialist auditing firm, Atom Consulting, to undertake the audit. We prepared this report to summarise the audit findings for the Minister for Energy and Utilities, the Hon. Don Harwin, MLC (the Minister).

The 2016-17 audit findings demonstrate that Hunter Water has shown an overall high level of compliance with its licence. Hunter Water achieved Full compliance for the majority of licence clauses audited this year, but Hunter Water's audit grades for its water quality clauses were not as good relative to last year. Although the quality of water produced by Hunter Water continues to be of a high standard and meet public health requirements, our auditor identified minor shortcomings that require attention from Hunter Water to ensure a high standard of water quality is maintained.

Hunter Water has demonstrated that it has made progress towards implementing recommendations from previous audits. In areas where the auditor assigned gradings of less than Full compliance, we have made recommendations for Hunter Water to continue to improve and maintain compliance with its licence.

Our recommendations

We audited 19 clauses and there were seven clauses for which our auditor did not assign Full compliance. Overall we assigned three clauses a High compliance grade, and four clauses an Adequate compliance grade. Our auditor prepared a final audit report detailing its findings and recommendations (Appendix A). We endorse all of these findings. Our 11 recommendations to Hunter Water to improve its compliance with its operating licence requirements are listed below.

Recommendations to Hunter Water

Water Quality Management System Implementation

1 By 30 September 2018, Hunter Water should ensure that a process is in place to identify and address repeat water quality incidents and trends. 14

2 By 30 September 2018, Hunter Water should ensure that all emergency and incident management procedures are reviewed, and revised if necessary, based on the Four Mile Creek Critical Control Point reporting breaches (July 2016 and June 2017). 14

- if inspecting a high risk site (eg, chlorinator or water treatment plant) that is in close proximity to a lower risk site (eg, reservoir or water pumping station) the lower risk site should also be included in the inspection, and 22
- an approach for those sites that are not near high risk sites. 22

We request that Hunter Water provide us with a report on its progress in implementing these recommendations by 31 May 2018, in accordance with the Reporting Manual.

Overview of audit findings

The 2016-17 audit found that Hunter Water had overall good compliance with its licence. This is the fifth and final audit in the 5-year term of the 2012–2017 licence.

We assigned Hunter Water Full compliance with 12 of the 19 clauses audited, High compliance for three clauses and Adequate compliance for four clauses. We audited one of the 19 clauses independently of the rest of the audit, regarding Hunter Water's membership of the Energy and Water Ombudsman NSW (EWON), in the 'Customers and Consumers' section of the licence. We assigned Hunter Water Full compliance for this clause. The compliance grades that we applied to the audit are explained in Appendix B. In summary, we assigned:

- **Full compliance** with all auditable requirements relating to:
  - Water quality relating to drinking water (clauses 2.1.3 and 2.1.4)
  - Water quality relating to recycled water (clause 2.2.3)
  - Assets (clauses 4.1.1 and 4.1.3)
  - Customers and consumers (clause 5.7.1)
  - Environmental management (clauses 6.1.1 and 6.1.2)
  - Quality management (clauses 7.1.1, 7.1.2 and 7.1.3), and
  - Performance monitoring relating to reporting (clause 8.2.2).
- **High compliance** with requirements relating to:
  - Water quality relating to recycled water (clause 2.2.4)
  - Assets (clause 4.1.2), and
  - Environmental management (clauses 6.1.3).
- **Adequate compliance** with requirements relating to:
  - Water quality relating to drinking water (clauses 2.1.1 and 2.1.2), and
  - Water quality relating to recycled water (clauses 2.2.1 and 2.2.2).

Hunter Water's compliance is summarised in Table 1 below.

Table 1 Hunter Water's compliance in 2016-17 with its 2012-2017 Operating Licence

Licence part	Number of audited clauses	Compliance grade assigned				
		Full	High	Adeq	NC	NR
Part 2 – Water quality	8	3	1	4	-	-
Part 4 – Assets	3	2	1	-	-	-
Part 5 – Customers and Consumers	1	1	-	-	-	-
Part 6 – Environment	3	2	1	-	-	-
Part 7 – Quality management	3	3	-	-	-	-
Part 8 – Performance monitoring	1	1	-	-	-	-
Total	**19**	**12**	**3**	**4**	**-**	**-**

Note: Full = Full Compliance; High = High Compliance; Adeq = Adequate Compliance; NC = Non-compliance; NR = Not Required.

Annual statement of compliance

In preparing this report we have also reviewed Hunter Water's annual Statement of Compliance (Appendix C). This is an exception-based report certified by the Managing Director and the Chairman of the Board of Directors of Hunter Water. It lists any licence breaches that occurred during the year. Further, any remedial action taken, or in the process of being taken, is reported.

This year Hunter Water reported two breaches of its licence in relation to:

- prompt reporting of residual chlorine exceedances to the NSW Ministry of Health (NSW Health) according to procedures, and
- exceeding the Water Continuity Standard, as defined in clause 4.2.3 of the licence.

Progress with previous recommendations

Finally, we note that in 2016-17 Hunter Water completed 10 out of the 13 outstanding recommendations from previous operating audits. Three recommendations were ongoing. We will continue to monitor and report on progress against each of these ongoing recommendations during each future audit. Three recommendations were replaced by new recommendations in this years' audit, to better match the auditor's current requirements, as follows:

- Recommendation 2014/15-01 is replaced by Recommendation 7, to be more specific regarding helminth control for agricultural sites that receive recycled water from Hunter Water.
- Recommendation 2014/15-02 is replaced by Recommendation 6 to clarify Hunter Water's actions in addressing its Critical Control Points (CCP) selection and validation.
- Recommendation 2014/15-03 is replaced by Recommendation 8 to focus on Hunter Water's approach to asset criticality and risk assessment.

The outstanding recommendations relate to the Water Quality Management Systems for drinking water and recycled water, and the Asset Management System. The outstanding issues relate to:

- Completing and implementing CCPs to the satisfaction of NSW Health.
- Completing a gap analysis of all Recycled Water Quality Management Plans (RWQMPs), against the Framework for Management of Recycled Water Quality and Use.
- Completing a review of the Asset Standards Management Plan and the Asset Class Management Plans.

Hunter Water has made progress against each of these recommendations but has not yet achieved completion to the satisfaction of the auditor. These recommended actions are not due for completion until 30 September 2018.

1 Introduction and scope

Hunter Water Corporation (Hunter Water) is a State Owned Corporation, wholly owned by the NSW State Government. Hunter Water's principle functions are to provide, construct, operate, manage and maintain systems and services for supplying water, providing sewerage and drainage services and disposing of wastewater in its Area of Operations.[1]

These roles and responsibilities, as well as Hunter Water's objectives, are prescribed by the *State Owned Corporations Act 1989* (NSW), the *Hunter Water Act 1991* (NSW) (the Act) and the Operating Licence (licence) issued to Hunter Water under Section 12 of the Act.

We have completed the 2016-17 annual operational audit of Hunter Water's compliance with the obligations imposed on it by its licence. We do this by receiving and reviewing reports, undertaking and attending audit interviews with utility staff, and undertaking field verification to investigate how effectively the requirements of the licence are met in practice. At the completion of the audit we publish the audit report and report our findings in this Report to the Minister for Energy and Utilities, the Hon. Don Harwin, MLC (the Minister).

We applied a risk-based approach to the Hunter Water audit. Further, we assessed compliance by reviewing an annual Statement of Compliance prepared and certified by Hunter Water (Appendix C). This is an exception-based report listing any licence non-compliances that occurred during the year. This statement also includes what remedial action has been taken, or is being taken, to resolve any reported breaches.

1.1 Purpose and structure of this report

The purpose of this report is to inform the Minister of Hunter Water's performance against its audited licence obligations for the audit period and to set out recommendations in response to these findings.

- This chapter (Chapter 1) explains the scope of the audit review and the process followed in undertaking the audit.
- Chapter 2 presents a summary of the audit findings and recommendations.
- Chapter 3 summarises the progress by Hunter Water to address and implement recommendations from previous audits.
- Appendix A provides the auditor's detailed audit report.
- Appendix B contains the table of compliance grades used for this audit.
- Appendix C provides Hunter Water's annual statement of compliance.
- Appendix D contains the audit scope.

1 As defined in Schedule B of Hunter Water's 2012-2017 operating licence.

1.2 Audit scope

This audit covers the period from 1 July 2016 to 30 June 2017.

The audit scope for this year included obligations relating to:

- Water Quality (Part 2) – requirements relating to the maintenance and implementation of the Drinking Water and Recycled Water Quality Management Systems.
- Assets (Part 4) - requirements relating to the maintenance and implementation of the Asset Management System, and Hunter Water's efforts to meet its system performance standards.
- Customers and Consumers (Part 5) – a requirement relating to the maintenance of Hunter Water's membership of the Energy and Water Ombudsman NSW (EWON).
- Environment (Part 6) – requirements relating to environmental management systems.
- Quality management (Part 7) – requirements relating to implementation of quality management systems.
- Performance monitoring (Part 8) - requirements relating to accurate reporting with regards to Hunter Water's Reporting Manual obligations.

No clauses from Part 1 (Licence and Licence Authorisation) and Part 3 (Water Quantity) were audited this year, following the risk-based approach used in the auditing program. IPART separately audited Part 5, Customers and Consumers to confirm Hunter Water's ongoing membership of EWON.

We consulted with the NSW Ministry of Health (NSW Health), Department of Primary Industries (DPI) Water (now the Department of Industry – Lands and Water), and sought public submissions in determining the scope of the audit. The audit scope is provided in Appendix D. This year, NSW Health identified the following areas of interest which related to:

- Hunter Water's progress on previous recommendations to develop and finalise Recycled Water Quality Management Plans (RWQMPs) for each of its recycled water schemes. The RWQMPs and supporting documentation were submitted to NSW Health.
- Hunter Water's ongoing work to review the critical limits and operation against Critical Control Points (CCPs) for drinking water treatment plants. Whilst this work has progressed significantly, it remains an important piece of work requiring finalisation.
- The need for Hunter Water to continue to progress in setting appropriate disinfection conditions (chlorine concentration and contact time or C.*t*) consistent with the *Australian Drinking Water Guidelines* (ADWG). The detection of thermophilic amoeba[2] in a sample in February 2017 during a period of extreme daily temperatures highlights that the risk exists for the occurrence of *Naegleria fowleri*. Adequate disinfection is important to control this potential risk.

2 Speciation determined that this was not the pathogen *Naegleria fowleri.*

- The legacy use of fire-fighting chemicals[3] associated with the Royal Australian Air Force, Williamtown Base. Groundwater contamination with PFAS has impacted on bore use and availability within the Tomago Bore Field. It would be appropriate to review protocols established with respect to the operation of the Tomago Bore Field and the awareness/compliance with the protocols considering some bores are located within or adjacent to the groundwater plume of PFAS.[4]

We investigated the PFAS issue in last year's audit. The audit found that the contamination did not constitute a reportable incident as the levels detected in groundwater were below United States Environmental Protection Agency (USEPA) guideline limits.[5] Hunter Water had isolated the contaminated bore fields from its water supply, and directed other water supplies to affected customers, where possible. Hunter Water is in frequent contact with NSW Health and the Environment Protection Authority regarding this matter. No further assessment was undertaken in this year's audit. We may follow up this issue in the 2017-18 audit.

We sought submissions from the public on matters related to the licence prior to the audit interviews. We advertised for public submissions in the Sydney Morning Herald, Daily Telegraph, and Newcastle Herald on 3 May 2017 and the Land on 4 May 2017. We received no public submissions.

1.3 The audit process

We monitor compliance with the licence through reporting requirements and a risk-based audit approach. Under this approach, we assess the risk of non-compliance with a licence obligation to determine an appropriate audit frequency for that requirement. We audit clauses that we consider to be 'high risk' more frequently, while low risk clauses are audited less frequently. We audit all requirements of the licence at least once during the 5-year term of the licence.

Adopting a risk-based approach has improved the effectiveness and efficiency of the auditing process, without increasing risks to the community. The approach allows audit resources to be targeted to areas of higher risk. It also reduces the overall burden of compliance for the utility.

We engaged Atom Consulting, in partnership with Risk Edge Pty Ltd and Cardno (Qld) Pty Ltd, to assist with the 2016-17 audit of Hunter Water. The auditor was required 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 information and evidence requirements, at least two weeks prior to the commencement of audit interviews.

3 Per- and poly- fluorinated alkyl substances (PFAS).
4 Letter to IPART, D. Durrheim, Service Director – Health Protection, Hunter New England Population Health, NSW Health, 29 August 2017.
5 IPART, *Hunter Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report,* December 2016, p 24.

3. Review reports and documents provided by Hunter Water in response to the questionnaire.
4. Conduct face-to-face interviews with Hunter Water staff at its offices.
5. Conduct field verification visits to assess the implementation of Hunter Water's systems and procedures.
6. Assess the level of compliance that Hunter Water achieved against each of the identified obligations of the licence (as per our risk-based audit scope), provide supporting evidence for this assessment and report on the level of compliance according to our compliance grades (Appendix B).
7. Assess and report on progress by Hunter Water in addressing any comments made by the relevant Minister and/or recommendations endorsed by us following previous audits, providing supporting evidence for these assessments.
8. Verify the calculation of performance indicators associated with requirements of the relevant licence and undertake an assessment of any underlying trends in performance arising from these indicators.
9. Provide drafts of the audit report to us and address comments from Hunter Water and us regarding draft audit findings.
10. Prepare a final report outlining audit findings (provided as Appendix A to this report).

Our auditor adopted an audit methodology that had regard to the *Australian Standard AS/NZS ISO 19011:2014 Guidelines for auditing management systems*. This guideline sets out a systematic approach to defining 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 *ASAE 3100 (2017) Compliance Engagements* (issued by the Auditing and Assurance Standards Board), *AS/NZS ISO 9001:2016 Quality management systems – Requirements*, and Aquamark and/or the *International Standard ISO 55001:2014 Asset management system – Requirements*.

Our auditor also carried out the audit according to our *Audit Guideline for Public Water Utilities*, May 2016.[6] Under this guideline, the auditor can make recommendations or suggest opportunities for improvement. Where we support an auditor's recommendation, we follow up the matter to ensure that it is addressed.

Where the auditor suggests opportunities for improvement, we take a different approach. Hunter Water can decide to implement an opportunity for improvement, based on its own assessment of whether the improvement is a prudent and efficient way to achieve its outcomes. We take this approach to balance improved performance with the investment required to achieve it. That is, we want the utility to consider the pricing implications of continued improvement and value for money, before the utility implements further improvements. As a consequence, we do not follow up the auditor's suggested opportunities for improvement.

We held a project start-up meeting with the auditor on 24 August 2017, to agree on the project milestones, audit timing, and outline our expectations. We also held an audit inception meeting with Hunter Water and the auditor on the first day of the audit

6 Available on our website (www.ipart.nsw.gov.au).

interviews, on 6 November 2017. At this meeting, expectations and protocols for the conduct of the audit were agreed. All parties adhered to the agreed protocols throughout the audit.

Our auditor conducted audit interviews from 6 to 8 November 2017 at Hunter Water's offices in Newcastle. On 7 November 2017, the auditor also undertook a site visit to the following locations:

- Kurri Kurri Wastewater Treatment Works (WWTW)
- Gresford water pump station – Paterson river extraction point
- Gresford Water Treatment Plant
- North Lambton depot
- New Lambton Heights planned maintenance job
- Wallsend water pump station, and
- Elermore Vale reservoir and chlorine dosing facility.

Our auditor assessed Hunter Water's compliance with the relevant requirements of the licence according to the compliance grades outlined in Appendix B.

2 Audit findings and recommendations

This chapter provides a summary of the auditor's findings and recommendations for each of the audited clauses of the licence. The 2016-17 audit is the fifth and final audit of the 2012-2017 licence.

Each section includes a table providing a comparison of Hunter Water's audit performance during its licence period. We abbreviate the compliance grades according to the following convention:

- **Full** = Full compliance
- **High** = High compliance
- **Adeq** = Adequate compliance
- **NC** = Non-compliant
- **NR** = No requirement.

Following each table, we discuss compliance and reasoning for the grade. We also discuss any recommendations and opportunities for improvement.

2.1 Water quality

Our auditor assigned Hunter Water Adequate compliance for clauses 2.1.1, 2.1.2, 2.2.1 and 2.2.2, High compliance for clause 2.2.4, and Full compliance with clauses 2.1.3, 2.1.4, and 2.2.3. We agree with theses audit grades.

Hunter Water's audit grades for its water quality clauses were not as good relative to last year. Although the quality of water produced by Hunter Water continues to be of high standard and meet public health requirements, our auditor identified minor shortcomings that require attention from Hunter Water to ensure a high standard of water quality is maintained. Our auditor notes the shortcomings identified in relation to water quality did not impact Hunter Water's ability to achieve defined objectives or to assure controlled processes, products or outcomes and did not compromise public health.

Part 2 of the licence, Water Quality, requires Hunter Water to have and implement water quality management systems that are consistent with the ADWG and *Australian Guidelines for Water Recycling* (AGWR), to the satisfaction of NSW Health.

Under the risk-based auditing framework, we consider that this part of the licence poses a high risk with respect to the combined effect of likelihood and consequence of non-compliance.

Table 2.1 Compliance with Part 2 of the licence – Water Quality

Clause	Requirement	Compliance grading				
2	**Water quality**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
2.1.1	Maintain Drinking Water Quality Management System	Adeq	Adeq	Full	High	Adeq
2.1.2	Fully implemented system	Adeq	High	Full	High	Adeq
2.1.3	Notification of significant changes	-	-	Full	-	Full
2.1.4	Obtain NSW Health's approval for any significant changes	-	-	Full	-	Full
2.2.1	Maintain Recycled Water Quality Management System	Full	High	Full	High	Adeq
2.2.2	Fully implemented system	Adeq	High	High	Adeq	Adeq
2.2.3	Notification of significant changes	-	-	-	-	Full
2.2.4	Obtain NSW Health's approval for any significant changes	-	-	-	-	High

a IPART, *Hunter Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016, p 15.

Adequate compliance (clause 2.1.1) with maintaining a Drinking Water Quality Management System (DWQMS)

Our auditor assigned Hunter Water Adequate compliance for clause 2.1.1, which required Hunter Water to maintain a DWQMS that is consistent with the ADWG, except to the extent that NSW Health specify otherwise. We agree with this audit grade.

Our auditor assigned an audit grade for each of the 12 elements of the ADWG, as well as assigning an overall grade for the licence clause. Our auditor assigned Full compliance for seven of the 12 elements, and High compliance for the remaining five elements. Our auditor identified several areas of excellence in relation to Hunter Water's compliance with the ADWG framework, including element 5 (Verification of drinking water quality), element 8 (Community Involvement and Awareness), and element 9 (Research and Development). However, our auditor also identified a number of shortcomings within the elements that were assigned a High compliance grade. We consider that the cumulative effect of these shortcomings, capturing several different root causes, result in an overall Adequate compliance grade. We have explained this in more detail below.

Prior to the audit, Hunter Water self-reported that it had failed to immediately report four short-term chlorine overdosing incidents to NSW Health, breaching the reporting protocols for one of its CCPs at the Four Mile Creek chlorinator. Hunter Water considered it had therefore not met its obligations under section 2.3 of the Reporting Manual.[7] The auditor was asked to investigate this issue, as part of its audit of the drinking water clauses.

7 IPART, *Hunter Water Corporation – Reporting Manual, June 2013*, pp 8-9.

The auditor found that there were 'gaps' in how Hunter Water applied the requirements of several of the 12 elements of the ADWG framework as described in its management plans, (the auditor identified the shortcomings in elements 4, 6, and 7 – refer Table 2-1 of the Audit Report).[8] However, the auditor did not find that the issues compromised public health and noted that Hunter Water's existing systems eventually picked up and resolved the issue. Therefore the auditor did not consider the breach of the CCP or the related failure to report, to result in licence non-compliance. Our auditor also identified a few shortcomings in relation to consistency with the ADWG formal requirement to field verify flow diagrams, and the ongoing CCP review[9] that has not been completed. Overall the number of issues identified rolls up to 'a number of shortcomings',[10] or an Adequate compliance grade.

Adequate compliance (clause 2.1.2) with implementing a DWQMS

Our auditor assigned Hunter Water Adequate compliance for clause 2.1.2, which required Hunter Water to fully implement and carry out all relevant activities in accordance with the DWQMS, and to the satisfaction of NSW Health. We agree with this audit grade.

Our auditor assigned an audit grade for each of the 12 elements of the ADWG, as well as assigning an overall grade for the licence clause. Our auditor assigned Full compliance to eight of 12 elements, Adequate compliance to element 4 (Operational Procedures and Process Control), element 6 (Management of Incidents and Emergencies), and element 10 (Documentation and Reporting), and High compliance for element 7 (Employee Awareness and Training).

Our auditor noted that:

- The Elermore Vale Reservoir site visit revealed shortcomings with Hunter Water's inspection process resulting in a potential pathway for water contamination not being identified for several months (element 4).
- The Four Mile Creek chlorinator CCP breach did not trigger a review of emergency and incident procedures as one of the remedial actions (element 6).
- A number of reporting non-compliances were noted, eg, Four Mile Creek (element 10).
- Some training issues were noted, eg, with the Elermore Vale Reservoir inspection and the management of the chlorinator CCP at Four Mile Creek (element 7).

The shortcomings roll up to a 'number of minor shortcomings' which results in an overall grade of Adequate compliance.

We make four recommendations in relation to clauses 2.1.1 and 2.1.2, based on the auditor's recommendations.

8 Atom Consulting, *Hunter Water Corporation Operational Audit Report*, pp 6-7.
9 Recommendation 2013/14-02, 03, 04, 06, 13 and Recommendation 2014/15-02 as noted in the audit report in Appendix A.
10 IPART compliance grades – Appendix B.

Recommendations to Hunter Water

1 By 30 September 2018, Hunter Water should ensure that a process is in place to identify and address repeat water quality incidents and trends.

2 By 30 September 2018, Hunter Water should ensure that all emergency and incident management procedures are reviewed, and revised if necessary, based on the Four Mile Creek Critical Control Point reporting breaches (July 2016 and June 2017).

3 For the next scheduled emergency scenario training exercise, Hunter Water should include a Critical Control Point breach as the scenario.

4 By 30 September 2018, Hunter Water should ensure that all personnel involved in undertaking reservoir inspections undertake training in the importance of accurately completing the reservoir inspection forms, including the records associated with the inspection.

Our auditor identified one opportunity for improvement for clause 2.1.1. This opportunity related to the appropriateness of an upper critical control limit for booster chlorination. Our auditor identified seven opportunities for improvement for clause 2.1.2. These opportunities related to the use of flow diagrams in risk assessments, ongoing staff and contractor training, and internal audit arrangements for the treatment operations contractor. Further details of the opportunities for improvement are available in the audit report in Appendix A.

Full compliance (clause 2.1.3) with notification of significant changes to the DWQMS

Our auditor assigned Hunter Water Full Compliance for clause 2.1.3, which required Hunter Water to notify IPART and NSW Health of any significant changes that it proposes to make to the DWQMS. We agree with this audit grade.

Our auditor noted that Hunter Water had notified both IPART and NSW Health during the audit period of proposed changes to the pH critical limits as required.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 2.1.3.

Full compliance (clause 2.1.4) with obtaining NSW Health's approval for any significant changes

Our auditor assigned Hunter Water Full Compliance for clause 2.1.4, which required Hunter Water to obtain NSW Health's approval for any significant changes to the DWQMS. We agree with this audit grade.

Our auditor noted that during the audit period significant changes were made to CCP critical limits with the approval of NSW Health.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 2.1.4.

Adequate compliance (clause 2.2.1) with maintaining a Recycled Water Quality Management System (RWQMS)

Our auditor assigned Hunter Water Adequate compliance for clause 2.2.1, which required Hunter Water to maintain a RWQMS that is consistent with the AGWR, except to the extent that NSW Health specify otherwise. We agree with this audit grade.

Our auditor assigned an audit grade for each of the 12 elements of the AGWR, as well as assigning an overall grade for the licence clause. Our auditor assigned Full compliance to eight of the 12 elements, High compliance to element 2 (Assessment of the Recycled Water System), element 3 (Preventive Measures for Recycled Water Management), and element 11 (Evaluation and Audit) and Adequate compliance to element 9 (Validation, Research and Development). We consider that the cumulative effect of the shortcomings outlined below, which capture several different root causes, result in an overall Adequate compliance grade.

Our auditor noted that Hunter Water was able to demonstrate that it had developed and maintained its RWQMS to be consistent with the AGWR. Hunter Water developed a corporate Recycled Water Quality Management Plan (RWQMP) as a roadmap for the RWQMS, structured according to the 12 elements, components, and actions set out in the AGWR. The corporate RWQMP is supported by scheme-specific RWQMPs and supporting documentation. Hunter Water has made significant effort in developing the corporate and scheme-specific RWQMPs.

Across some aspects of the RWQMS there were a number of shortcomings that did not result in identified public health or environmental impacts during the audit period resulting in a finding of adequate compliance. The ongoing review of the CCP including justification for selection of parameters and limits, the process for validation of critical limits and verification of process flow diagrams are some of the key areas that require improvement.

Specifically the auditor noted that, whilst Hunter Water had made a significant effort to develop the RWQMPs, there remained gaps that needed to be addressed, as follows:

- The Corporate and site-specific RWQMP make a number of statements regarding activities that will be done, rather than what is currently undertaken, eg the processes for validation and verification noted under element 9.
- There are a number of circumstances where the corporate and site-specific RWQMPs each state that actions are documented in the other RWQMP document.
- There are a number of shortcomings that did not result in identified public health risks or environmental impacts, however these gaps need to be rectified, eg, evidence of field verification of process flow diagrams.

Adequate compliance (clause 2.2.2) with implementing a RWQMS

Our auditor assigned Hunter Water Adequate compliance for clause 2.2.2, which required Hunter Water to implement a RWQMS and that all relevant activities are carried out in accordance with the RWQMS, and to the satisfaction of NSW Health. We agree with this audit grade.

Our auditor assigned an audit grade for each of the 12 elements of the AGWR, as well as assigning an overall grade for the licence clause. Our auditor assigned Full compliance to seven of the 12 elements, High compliance to element 1 (Commitment to Responsible Use and Management of Recycled Water Quality), element 2 (Assessment of the Recycled Water System), and Adequate compliance to element 3 (Preventive Measures for Recycled Water Management), element 9 (Validation, Research and Development), and element 11 (Evaluation and Audit).

Our auditor noted that documentation of the operation and maintenance associated with end-user hand over points was industry best practice, and the collaborative nature of the relationship between Veolia[11] and Hunter Water was noted as being a key factor in the successful implementation of a risk-based approach to recycled water management.

Our auditor also noted a number of shortcomings in relation to the implementation of the RWQMS:

- Not all CCPs were entered in SCADA[12] in the audit period.
- Log reduction values reported in the Validation Testing Program did not support the selection of these processes as CCPs.
- A number of aspects associated with preventative barriers, their validation and verification remain unresolved. This includes ultraviolet (UV) disinfection units not working as expected, and the basis for determining CCPs was not well established, including a lack of documented justification for the selection of monitoring parameters and critical limits.
- Internal audits and annual reviews were not all undertaken according to schedule.

We make three recommendations in relation to clauses 2.2.1 and 2.2.2, based on the auditor's recommendations.

Recommendations to Hunter Water

5 By 30 December 2018, Hunter Water should update the Corporate Recycled Water Quality Management Plan to document current activities and processes. This should include filling any gaps identified as part of Recommendation 15/16-05.

6 By 30 September 2018, Hunter Water should:

- Develop a table in each scheme Recycled Water Quality Management Plan that documents the evidence for the selection of the Critical Control Point, its associated monitoring parameter(s) and limits. This should include sufficient document control to capture when changes are made and the basis of those changes.
- Consult with NSW Health on the validation testing program for the water recycling schemes.

11 Operation and maintenance of Water and Wastewater treatment operations has been outsourced to Veolia Water Australia, under contract.

12 Supervisory Control and Data Acquisition (SCADA) control system.

– Specify the performance required of the ultraviolet (UV) units in their operating context and determine whether they are achieving this performance. Any failure in the performance of pre-validated UV units should be further investigated.

7 By 30 September 2018, Hunter Water should ensure the preventive measures for helminth control for agricultural sites (Karuah, Morpeth and Farley) achieve the required log reduction values as per the *Australian Guidelines for Water Recycling 2006*.

Our auditor identified two opportunities for improvement for clauses 2.2.1 and 2.2.2. These opportunities related to reviewing annual inspection reports to include the receiving environment monitoring, and involving appropriate stakeholders (eg, end-users) in risk assessments. Further details of the opportunities for improvement are available in the audit report in Appendix A.

Full compliance (clause 2.2.3) with notification of significant changes to the RWQMS

Our auditor assigned Hunter Water Full compliance for clause 2.2.3, which required Hunter Water to notify IPART and NSW Health of any significant changes that it proposes to make to the RWQMS. We agree with this audit grade.

Our auditor noted that Hunter Water reviews changes to the RWQMPs monthly and notified IPART of significant changes during the audit period.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 2.2.3.

High compliance (clause 2.2.4) with obtaining NSW Health's approval for any significant changes

Our auditor assigned Hunter Water High compliance for clause 2.2.4, which required Hunter Water to obtain NSW Health's approval for any significant changes to the RWQMS. We agree with this audit grade.

Our auditor noted that there was evidence of NSW Health's engagement with the process of updates to RWQMP's but there was a lack of evidence that NSW Health had approved any changes prior to significant change implementation by Hunter Water.

During the audit period NSW Health advised Hunter Water and IPART that NSW Health's review of recycled water and drinking water management plans should not be considered an approval or endorsement of the documentation. NSW Health advised that its review of the management plans would focus on potential public health issues. NSW Health's position in relation to formal approval was resolved in the new operating licence by removing this requirement, but maintaining NSW Health's role in providing input to the process.

We do not make any recommendations in relation to clause 2.2.4 as this clause does not continue in the Hunter Water 2017-2022 Operating Licence.

2.2 Asset management

Our auditor assigned Hunter Water Full compliance for clauses 4.1.1 and 4.1.3, and High compliance for clause 4.1.2. We agree with these audit grades.

Part 4 of the licence, Assets, outlines the obligation for Hunter Water to maintain and implement an Asset Management System (AMS). Under the risk-based auditing framework, we consider that this part of the licence poses a high risk with respect to the combined effect of likelihood and consequence of non-compliance.

Table 2.2 Compliance with Part 4 of the licence – Assets

Clause	Requirement	Compliance grading				
4	**Assets**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
4.1.1	Maintain Asset Management System standard	High	High	High	Full	Full
4.1.2	Asset Management System implementation	Full	Full	Full	High	High
4.1.3	Significant changes to Asset Management System	-	-	-	NR	Full

a IPART, *Hunter Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016, p 20.

Full compliance (clause 4.1.1) with maintaining an AMS standard

Our auditor assigned Hunter Water Full compliance for clause 4.1.1, which required Hunter Water to maintain a management system that is consistent with the *BSI PAS 55:2008 Asset Management Standard*, the Water Services Association of Australia's (WSAA) Aquamark[13] benchmarking tool, or another asset management standard agreed to by IPART. We agree with this audit grade.

Our auditor noted that for the 2016-17 audit period Hunter Water maintained an AMS that is consistent with the Water Services Association of Australia's Aquamark benchmarking tool. This framework will not be is use for much longer as Hunter Water was actively transitioning to a system in accordance with *ISO 55001:2014 Asset Management System – Requirements* during the audit period. During the audit period Hunter Water participated in WSAA's Asset Management Customer Value benchmarking exercise that found:

- Hunter Water is above the median level of maturity for all seven function areas when compared with Australian water utilities.
- Hunter Water was rated near the top of the cohort on the asset acquisition function when compared with Australian water utilities.
- Hunter Water improved its scoring in the functions between 2012 and 2016.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 4.1.1.

13 Aquamark was renamed Asset Management Customer Value (AMCV) in 2016.

High compliance (clause 4.1.2) with AMS implementation

Our auditor assigned Hunter Water High compliance for clause 4.1.2, which required Hunter Water to ensure that the AMS is fully implemented and that all relevant activities are carried out in accordance with the system. We agree with this audit grade.

Our auditor noted that, while Hunter Water is implementing the AMS, the approach to asset criticality[14] and risk assessment is not fully implemented or consistent across all asset classes. Hunter Water is in the process of revising how it rates asset criticality to focus on the impact to service delivery for all water and sewer mains.

Our auditor also investigated the Water Continuity Standard breach reported by Hunter Water.[15] The auditor found that Hunter Water's self-assessed criticality and risk of failure of the main was inaccurate. The modelling used in defining consequence and likelihood ratings indicated that less than 2,000 properties would be affected. The auditor found that the difficulty in modelling system performance was the primary reason for the severity of the event and the subsequent breach of the Water Continuity Standard. Hunter Water's approach to assessing asset criticality was appropriate, but was impacted by the modelling output, resulting in a risk being assessed at a lower level than was appropriate for the particular asset. The auditor noted that the issue highlighted the need to continually improve modelling where new information becomes available.

We make two recommendations in relation to clause 4.1.2, based on the auditor's recommendations.

Recommendations to Hunter Water

8 By 30 June 2019, Hunter Water should fully implement an asset criticality and risk assessment approach that is consistent across all asset classes and consistent with the enterprise risk management framework.

9 Hunter Water should review the currency of all planned maintenance work instructions (for all assets) and prepare a program to update these as required over a period in accordance with its document control standard. The program should be prepared by 31 December 2018.

Our auditor identified no opportunity for improvement for clause 4.1.2.

Full compliance (clause 4.1.3) with notification of significant changes to the AMS

Our auditor assigned Hunter Water Full compliance for clause 4.1.3, which required Hunter Water to notify IPART of any significant changes that it proposes to make to the AMS in accordance with the Reporting Manual. We agree with this audit grade.

Our auditor noted that Hunter Water had provided notification of the proposed changes to its AMS through its 2016-17 Compliance and Performance Report that was submitted to IPART.

14 This refers to the consequences of failure of an asset.

15 In 2017, a water main break at Myuna Bay accounted for over 50% of Hunter Water's self-reported breach of its Water Continuity Standard (>10,000 properties were affected for >5 continuous hours).

Our auditor identified no recommendation or opportunity for improvement in relation to clause 4.1.3.

2.3 Customers and consumers

We assigned Hunter Water Full compliance for clause 5.7.1, which requires Hunter Water to be a member of the Energy and Water Ombudsman NSW (EWON).

Part 5 of the licence, Customers and consumers, outlines the obligation for Hunter Water to implement and maintain its procedures relating to financial hardship, payment difficulties, water flow restriction and disconnection, and internal dispute resolution. Under the risk-based auditing framework, we consider that this part of the licence poses a low to moderate risk with respect to the combined effect of likelihood and consequence of non-compliance.

Table 2.3 Compliance with Part 5 of the licence – Customers and consumers

Clause	Requirement	Compliance grading				
5	**Customers and consumers**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
5.7.1	Hunter Water must be a member of the Energy and Water Ombudsman NSW	-	-	-	-	Full

a IPART, *Hunter Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016, p 22.

Full compliance (clause 5.7.1) with maintaining membership of EWON

We assigned Hunter Water Full compliance for clause 5.7.1, which required Hunter Water to maintain its membership with the EWON. We note that Hunter Water maintained its membership during the audit period and that further details regarding complaints can be found in the EWON annual report 2016-17.[16]

We identified no recommendation or opportunity for improvement in relation to clause 5.7.1.

2.4 Environment

Our auditor assigned Hunter Water Full compliance for clauses 6.1.1 and 6.1.2, and High Compliance for clause 6.1.3.

Part 6 of the licence, Environment, outlines the obligation for Hunter Water to develop, certify, maintain, and implement an Environmental Management System. Under the risk-based auditing framework, we consider that this part of the licence poses a moderate risk with respect to the combined effect of likelihood and consequence of non-compliance.

16 Available online: https://www.ewon.com.au/content/Document/Publications%20and%20submissions/EWON%20reports/EWON-annual-report-2016-2017-web.pdf

Table 2.4 Compliance with Part 6 of the licence – Environment

Clause	Requirement	Compliance grading				
6	**Environment**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
6.1.1	Develop an Environmental Management System	-	-	-	-	Full
6.1.2	Ensure Environmental Management System is certified and maintained	-	-	-	-	Full
6.1.3	Implement Environmental Management System	-	-	-	-	High

Full compliance (clause 6.1.1) with development of an Environmental Management System (EMS)

Our auditor assigned Hunter Water Full compliance for clause 6.1.1, which required Hunter Water to develop a Management System that is consistent with the *AS/NZS ISO 14001:2004: Environmental Management Systems – Requirements with guidance for use* (ISO 14001) by 30 June 2017. We agree with this audit grade.

Our auditor noted that Hunter Water had developed and EMS consistent with ISO 14001 in 2014, and a re-certification audit report confirmed compliance with the 2004 standard for the audit period.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 6.1.1.

Full compliance (clause 6.1.2) with certification and maintenance of an EMS

Our auditor assigned Hunter Water Full compliance for clause 6.1.2, which required Hunter Water to ensure that by 30 June 2017, the EMS is certified by an appropriately qualified third party to be consistent with ISO 14001, and certification is maintained during the term of the licence. We agree with this audit grade.

Our auditor noted that the EMS was certified on 22 October 2014 by an appropriately qualified third party, and although outside the date of the audit scope Hunter Water has recently achieved certification to ISO 14001:2015. While Hunter Water has implemented a system consistent with a later version of the ISO 14001 standard, this is still consistent with the licence requirement. Ongoing surveillance audits and the re-certification to the later version of the standard demonstrate that the system has been maintained since certification in 2014.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 6.1.2.

High compliance (clause 6.1.3) with implementing an EMS

Our auditor assigned Hunter Water High compliance for clause 6.1.3, which required Hunter Water to ensure that by 30 June 2017, the EMS is fully implemented and that all relevant activities are carried out in accordance with the system. We agree with this audit grade.

Our auditor noted that a number of improvements were implemented in the audit period. Our auditor also noted a few minor shortcomings in relation to training of operational and maintenance staff in environmental issues, which became evident during maintenance and inspection activities. Specifically the auditor noted:

- Two environmental issues were not noted when conducting an annual reservoir inspection at Elermore Vale Reservoir.
- The current schedule of inspections of higher risk sites may mean that some lower risk areas are being missed with the flow-on potential to miss environmental impacts that may escalate.

We make two recommendations in relation to clause 6.1.3, based on the auditor's recommendations.

Recommendation 11 intends to apply a cost benefit approach to the oversight of risks, where the low risk sites in close proximity to high risk sites are inspected at the same time, resulting in a lower overall cost than if the low risk site was separately inspected. This approach would achieve an incremental improvement. We consider Hunter Water should also develop an approach to how it will inspect other low risk sites, also considering the costs and benefits associated with those inspections.

Recommendations to Hunter Water

10 By 30 September 2018, Hunter Water should conduct refresher training of operations and maintenance staff for annual inspections and maintenance activities. In particular, there should be focus on identifying environmental impacts and ensuring mitigation of any impacts noted.

11 By 30 September 2018, Hunter Water should complete a review of its schedule of environmental inspections, and expand the schedule where relevant to include the following:

- if inspecting a high risk site (eg, chlorinator or water treatment plant) that is in close proximity to a lower risk site (eg, reservoir or water pumping station) the lower risk site should also be included in the inspection, and
- an approach for those sites that are not near high risk sites.

Our auditor identified two opportunities for improvement for clause 6.1.3. These opportunities related to assembling an appropriate team for risk assessment reviews, and keeping a record of those in attendance for reviews. Further details of the opportunities for improvement are available in the audit report in Appendix A.

2.5 Quality management

Our auditor assigned Hunter Water Full compliance for clauses 7.1.1, 7.1.2, and 7.1.3. We agree with these audit grades.

Part 7 of the licence, Quality management, outlines the obligation for Hunter Water to develop, certify, maintain, and implement a Quality Management System. Under the risk-based auditing framework, we consider that this part of the licence poses a moderate risk with respect to the combined effect of likelihood and consequence of non-compliance.

Table 2.5 Compliance with Part 7 of the licence – Quality management

Clause	Requirement	Compliance grading				
7	**Quality management**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
7.1.1	Develop a Quality Management System by 30 June 2017	-	-	-	-	Full
7.1.2	Ensure Quality Management System is certified and maintained	-	-	-	-	Full
7.1.3	Implement Quality Management System	-	-	Full	-	Full

a IPART, *Hunter Water Corporation Operational Audit 2014-15 – Report to the Minister – Compliance Report*, March 2016, p 18.

Full compliance (clause 7.1.1) with developing a Quality Management System (QMS)

Our auditor assigned Hunter Water Full compliance for clause 7.1.1, which required Hunter Water to develop a Management System that is consistent with *AS/NZS ISO 9001:2008 Quality Management Systems - Requirements* (ISO 9001) by 30 June 2017. We agree with this audit grade.

Our auditor noted that Hunter Water's QMS achieved certification to ISO 9001 in August 2015, before the 30 June 2017 due date. The auditor confirmed certification and reviewed the external audit report.

We note that during the audit period, Hunter Water achieved certification to ISO 9001:2015. While Hunter Water has implemented a system consistent with a later version of the ISO 9001 standard, this is still consistent with the licence requirement.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 7.1.1.

Full compliance (clause 7.1.2) with certification and maintenance of a QMS

Our auditor assigned Hunter Water Full compliance for clause 7.1.2, which required Hunter Water to certify its QMS by 30 June 2017 and maintain certification. We agree with this audit grade.

Our auditor noted that the QMS was certified by an appropriately qualified third party certifier, to meet the requirements of ISO 9001 in August 2015. Surveillance audits and re-certification to the newer standard within the audit period confirmed that Hunter Water had maintained certification. The auditor noted that Hunter Water demonstrated commitment to improvement and maintenance of the system. Since certification, Hunter Water has transitioned to ISO 9001:2015 with certification achieved in June 2017.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 7.1.2.

Full compliance (clause 7.1.3) with implementing a QMS

Our auditor assigned Hunter Water Full compliance for clause 7.1.3, which required Hunter Water to fully implement its QMS and that all relevant activities are carried out in accordance with the system. We agree with this audit grade.

Our auditor noted that Hunter Water has an Integrated Management System (IMS) that includes quality management. The implementation was tested across several areas including drinking water and environmental management and was found to be robust. The auditor commended Hunter Water on the succinct nature of the IMS, and how clearly the quality management requirements fit within that system. The audit confirmed that the system is implemented in practice.

The internal audit requirements of the IMS are reflected in the treatment operations contract. The contractor must implement a DWQMS and have it audited for compliance by an approved auditor.

Our auditor identified no recommendation in relation to clause 7.1.3. Our auditor identified five opportunities for improvement for clause 7.1.3. These opportunities related to minor clarifications and updates as Hunter Water implements a new Governance, Risk, and Compliance solution. Further details of the opportunities for improvement are available in the audit report in Appendix A.

2.6 Performance monitoring

Our auditor assigned Hunter Water Full compliance for clause 8.2.2. We agree with this audit grade.

Part 8 of the licence, Performance monitoring, outlines Hunter Water's obligations regarding audits, reporting, provision of information and performance indicators. Under the risk-based auditing framework, we consider that this part of the licence poses a low to moderate level of risk with respect to the combined effect of likelihood and consequence of non-compliance.

Table 2.6 Compliance with Part 8 of the licence – Performance monitoring

Clause	Requirement	Compliance grading				
8	**Performance monitoring**	**2012-13[a]**	**2013-14[a]**	**2014-15[a]**	**2015-16[a]**	**2016-17**
8.2.2	Maintain sufficient record systems	Full	-	-	High	Full

a IPART, *Hunter Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016, p 24.

Full compliance (clause 8.2.2) with maintaining sufficient record systems

Our auditor assigned Hunter Water Full compliance for clause 8.2.2, which required Hunter Water to maintain sufficient record systems. We agree with this audit grade.

Our auditor noted that Hunter Water's management and information systems are sufficiently robust for the purpose of accurate reporting in accordance with the Reporting Manual. The reporting data relating to the Reporting Manual was found to be reliable.

Our auditor identified no recommendation or opportunity for improvement in relation to clause 8.2.2.

3 Progress on previous audit recommendations

The previous audits in 2013-14, 2014-15, and 2015-16 identified areas where Hunter Water's performance with its licence obligations did not receive Full compliance. We previously made recommendations to the Minister to address these issues.[17] The following table outlines Hunter Water's progress in implementing these recommended actions.

Hunter Water completed 10 out of 13 outstanding recommendations from previous audits. Three recommendations were ongoing.

Where a recommendation is ongoing in Table 3.1, we will follow it up in our next annual operational audit, together with the recommendations from this year's audit.

Table 3.1 Hunter Water's progress in 2016-17 to address our recommendations from the previous audits

Rec No.	Recommendation	Progress
2013-14-02, 2013-14-03, 2013-14-04, 2013-14-06, 2013-14-13 Clause 2.1.1, 2.1.2, 2.2.1 and 2.2.2	Within 6 months, Hunter Water should review CCPs for each treatment plant, including: a) review all CCP critical limits (including alarm delays), and monitoring points to ensure they reflect current practice, as agreed with NSW Health. b) develop a process to ensure critical limits are only altered with supervisory consent and there is a failsafe process to ensure that they are reinstated before water quality is compromised. c) revise and review CCP documentation to clearly state location, parameters, target criteria, monitoring frequency, critical limits, corrective actions and responsibilities for each CCP. d) develop a process to record and document corrective actions, and preventive measures to reduce risks, and e) operational and critical limits must be set in SCADA as alarms, including delay times where appropriate.	**Ongoing** *Drinking Water CCPs:* NSW health is reviewing revised CCP documentation prepared by Hunter Water incorporating previous feedback by NSW Health. This part of the recommendation remains open. *Recycled Water CCPs:* NSW Health has expressed satisfaction with the status of the review and updated program for the RWQMPs. Some work is still to be completed. This part of the recommendation remains open. To assist in the identification of any aspect still outstanding in the 2017-18 audit the auditor makes a further recommendation: f) for the 2017-18 audit Hunter Water should prepare a report (supported by detailed auditable evidence) that demonstrates the status of each part of this Recommendation for each system.
2013-14-14, 2013-14-12 Clause 2.2.2	Within 12 months, Hunter Water should review the following matters in respect to the Clarence Town Wastewater Treatment Works (WWTW): ▼ The effectiveness of the CCPs. If the	**Complete** The first component of this recommendation was completed previously, and during the 2016-17 audit period a risk assessment review was undertaken for Clarence Town

17 IPART, *Hunter Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

Rec No.	Recommendation	Progress
	corrective action can be undertaken in a timely manner, and it reduces risk, then implement the CCPs as soon as possible. ▼ The risk assessment at Clarence Town WWTW to take account of irrigation-water ponding at the site.	WWTW, and lagoon ponding has been included as a CCP. Any shortcoming relating to documentation regarding the basis for CCP is captured by new Recommendation 6.
2013-14-20 Clause 4.1.1	Hunter Water should continue implementing the five improvement initiatives identified as part of its 2012 Benchmarking Program including: ▼ develop a holistic approach to asset maintenance, and ▼ the complete capture of all asset and related maintenance information in its Ellipse Asset/ Maintenance Management System. (It was noted that these initiatives should be fully implemented by December 2017, consistent with Hunter Water's ISO 55001 development program).	**Complete** Hunter Water has adequately progressed this recommendation and implemented improvements to many areas of the planned maintenance process consistent with its ISO 55001 implementation program.
2014-15-01 Clause 2.2.2	It is recommended that Hunter Water commence the implementation of the interim CCPs as soon as possible and finalise validation program.	**Complete** Hunter Water had made progress with a completed study into helminth controls, but issues were noted regarding validation of critical limits and the poor log reductions for the Cessnock and Kurri Kurri UV units. This recommendation is closed as any outstanding shortcomings are captured by new Recommendation 7.
2014-15-02 Clause 2.2.2	It is recommended that Hunter Water finalise its validation program under its RWQMS and facilitate endorsement of the outcomes by NSW Health. CCPs should then be adjusted or refined in accordance with the outcomes.	**Complete** Hunter Water had made progress with a completed study into helminth controls, but the selection of CCP monitoring parameters and basis of CCP limits in relation to validation results is not well documented. This recommendation is closed as any outstanding shortcomings are captured by new Recommendation 6.
2014-15-03 Clause 4.1.1	It is recommended that Hunter Water continues to fully implement improvement initiatives in respect of: ▼ the development and implementation of a holistic approach to maintenance management ▼ the complete capture of all asset and related maintenance information in its Enterprise Resource Planning (Asset/ Maintenance Management) System ▼ criticality and condition assessment, and ▼ review and update of operational and maintenance procedures across the whole of the asset portfolio.	**Complete** Hunter Water has in place a program to continually improve these procedures. Shortcomings were identified within the improvement initiatives in respect of reviewing planned maintenance work instructions, and asset criticality and risk assessment. This recommendation is closed as any outstanding shortcomings are captured by new Recommendation 8.
2015-16-01 Clause 2.1.1	By 30 June 2017, review all system process flow diagrams including all process steps,	**Complete** The auditor was satisfied that all system

Rec No.	Recommendation	Progress
and 2.1.2	inputs, monitoring points, key characteristics, handover points between parties and raw water customers, to ensure that: ▼ each flow diagram matches the SCADA diagram ▼ each flow diagram and SCADA diagram is signed-off by someone with appropriate authority, and ▼ each flow diagram has associated version history and review cycle information.	process flow diagrams had been reviewed and improved, matched to SCADA, and appropriately signed-off.
2015-16-02 Clause 2.1.1 and 2.1.2	By 30 June 2017, use the revised flow diagram to revise the risk assessment for Lemon Tree Passage Water Treatment Plant.	**Complete** Hunter Water reviewed the risk assessment for the Lemon Tree Passage Water Treatment Plant, and retired risks based on site verification of the flow diagram.
2015-16-03 Clause 2.1.1 and 2.1.2	By 30 June 2017, review and revise documentation associated with the emergency management process including: ▼ Veolia's Crisis Management Plan ▼ cross-referencing in the Hunter Water Emergency Management Plan, and ▼ the currency across all document history fields in Veolia's Incident Recording and Reporting procedure.	**Complete** The Hunter Water and Veolia emergency management documentation have been reviewed and updated to meet the requirement of this recommendation. An ongoing task to review contact details has been incorporated into the existing Hunter Water Corporate Business Resilience Calendar.
2015-16-04 Clause 2.2.1 and 2.2.2	By 30 June 2017, Hunter Water should review the implementation of recommendations from its Environmental Compliance Audit for the Karuah Effluent Reuse Enterprise, and develop appropriate deadlines for any recommendations that have not been addressed.	**Complete** Hunter Water tracked activities against this recommendation through a register and all actions were noted to be complete. The auditor was satisfied that this recommendation is complete.
2015-16-05 Clause 2.2.1, and 2.2.2	By 30 June 2018, Hunter Water should ensure that a gap analysis is completed of all RWQMPs, against the Framework for Management of Recycled Water Quality and Use. Particular focus should be given to the gaps in compliance areas detailed in the 2015-16 audit report.	**Ongoing** Limited high level progress has been made, and the auditor has recommended updating the recommendation to: ▼ By 30 September 2018, Hunter Water should ensure that a gap analysis is completed of all RWQMPs, against the Framework for Management of Recycled Water Quality and Use. Particular focus should be given to the gaps in compliance areas detailed in the 2015-16 and 2016-17 (this) report.
2015-16-06 Clause 4.1.2	By 31 December 2017, review the Asset Standards Management Plan and the Asset Class Management Plans, which were overdue for review. Ensure all Asset Class Management Plans meet Hunter Water's document control system.	**Ongoing** Hunter Water provided a schedule detailing the status of revisions of the Asset Class management Plans which showed that 17 of 52 plans are yet to be updated.
2015-16-07 Clause 8.2.2	By 30 June 2017, Hunter Water should ensure all compliance related documents are consistent with Hunter Water's procedure for managing document control.	**Complete** Hunter Water provided a schedule demonstrating consistency with its Corporate Document Control Standard. The auditor is satisfied that the requirement of this recommendation has been met.

Our auditor found that 10 of the 13 previous recommendations were complete.

- Four of the 13 recommendations, were substantially completed during 2016-17 in accordance with the due dates, with any remaining parts of the recommendations captured by this audit's recommendations.
- Six of the 13 recommendations were completed before the due dates.
- Three recommendations are ongoing and progress will be assessed at the 2017-18 operational audit.

Hunter Water demonstrated reasonable effort in completing the audit recommendations.

Appendices

A Auditor's operational audit report 2016-17 – Hunter Water

Hunter Water Corporation

Operational Audit

IPART

Date: January 2018

Version: 3.00

Final draft report

TECHNICAL FACILITATION SPECIALISTS

Document Status:	Version: 3.00	Final draft report		
Document History:	Status	Review	Version	Date
	Internal draft	AC	1.0	29/11/2017
	Preliminary draft report	SC	2.0	1/12/2017
	Final draft report	AC	3.0	20/01/2018
Authors:	Dr Annalisa Contos, Dr Annette Davison, Stephen Walker, Natalie Crawford			
Contact:	Annalisa Contos Atom Consulting 65 Cambourne Ave St Ives NSW 2075 annalisa@atomconsulting.com.au 02 9488 7742			
File Name:	IPT1707HWC Final Draft Report Version 3.0.docx			

Executive Summary

Auditors' declaration

This report presents the findings of the audit of Hunter Water Corporation's operations, against the *Hunter Water Operation Licence 2012-2017* and the *Hunter Water Act 1991* (NSW), consistent with audit requirements set out in IPART's *Audit Guideline Public Water Utilities* (May 2016) for the period 1 July 2016 to 30 June 2017.

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* (May 2016) 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 2016-2017 audit period is shown in Table i-i.

Table i-i Summary of audit findings against audited licence obligations

Section	Clause	Sub clauses	Audit findings
2. Water quality	2.1. Drinking water	2.1.1	Adequate compliance
		2.1.2	Adequate compliance
		2.1.3	Full compliance
		2.1.4	Full compliance
	2.2. Recycled water	2.2.1	Adequate compliance
		2.2.2	Adequate compliance
		2.2.3	Full compliance
		2.2.4	High compliance
4. Assets	4.1 Asset Management System	4.1.1	Full compliance
		4.1.2	High compliance
		4.1.3	Full compliance
6. Environment	6.1 Environmental Management	6.1.1	Full compliance
		6.1.2	Full compliance
		6.1.3	High compliance
7. Quality	7.1 Quality Management System	7.1.1	Full compliance
		7.1.2	Full compliance
		7.1.3	Full compliance
8. Performance monitoring	8.2 Reporting	8.2.2	Full compliance

Recommendations

Recommendations arising from the Hunter Water 2016-17 operational audit are shown in Table i-ii.

Table i-ii Operational audit 2016-2017 recommendations

Section	Clause	Recommendations
2 Water Quality	2.1.1	**Recommendation 2.1.1-1:** To avoid repetition of incidents, ensure that a system is in place (e.g. through the functions of the Water Quality Committee) to check incidents for trends and flag any that have happened previously (by 30 September 2018).
	2.1.2	**Recommendation 2.1.2-1:** By 30 September 2018, ensure that all emergency and incident management procedures are reviewed, and revised if necessary, based on the Four Mile Creek CCP reporting breach (July 2016 and June 2017).
	2.1.2	**Recommendation 2.1.2-2:** For the next scheduled emergency scenario training exercise, include a CCP breach as the example.
	2.1.2	**Recommendation 2.1.2-3:** By 30 September 2018, ensure that all personnel involved in undertaking reservoir inspections undertake training in the importance of accurately completing the reservoir inspection forms, including the records associated with the inspection.
	2.2.1	**Recommendation 2.2.1-1:** By 30 December 2018 Hunter Water should update the Corporate RWQMP to document current activities and processes. This should include filling any gaps identified as part of Recommendation 15/16-05.
	2.2.1	**Recommendation 2.2.1-2:** By 30 September 2018, Hunter Water should: – Develop a table in each scheme RWQMP that documents the evidence for the selection of the CCP, its associated monitoring parameter(s) and limits. This should include sufficient document control to capture when changes are made and the basis of those changes. – Consult with NSW Health on the validation testing program for the water recycling schemes. – Specify the performance required of the UV units in their operating context and determine whether they are achieving this performance. Any failure in the performance of prevalidated UV units should be further investigated.
	2.2.2	**Recommendation 2.2.2-1:** By 30 September 2018 ensure the preventive measures for helminth control for agricultural sites (Karuah, Morpeth and Farley) achieve the required LRVs as per the AGWR
4 Assets	4.1.2	**Recommendation 4.1.2-1:** By 30 June 2019 Hunter Water should fully implement an asset criticality and risk assessment approach that is consistent across all asset classes and consistent with the enterprise risk management framework.
	4.1.2	**Recommendation 4.1.2-2:** We recommend that Hunter Water reviews the currency of all planned maintenance work instructions (for all assets) and prepares a program to update these as required over a period in accordance with its document control standard.
6 Environment	6.1.3	**Recommendation 6.1.3-1:** By 30 September 2018, refresher training of operations and maintenance staff should be conducted for annual inspections and maintenance activities. In particular, there should be a focus on identifying environmental impacts and ensuring mitigation of any impacts noted.
	6.1.3	**Recommendation 6.1.3-2:** By 30 September 2018, the schedule of environmental inspections should be reviewed and expanded where relevant to include the following: if inspecting a high risk site (e.g. chlorinator or WTP) that is in close proximity to a lower risk site (e.g. reservoir or water pumping station) the lower risk site should also be included in the inspection.

Progress of previous audit recommendations

A summary of assessed progress against previous audit recommendations is shown in Table i-iii.

Table i-iii Summary of assessed progress of previous audit recommendations

Recommendation	IPART's recommendation to the Minister	Progress
2013-14-02,03,04,06,13	Within 6 months, Hunter Water should review Critical Control Points (CCPs) for each treatment plant, including: a) review all CCP critical limits (including alarm delays), and monitoring points to ensure they reflect current practice, as agreed with NSW Health b) develop a process to ensure critical limits are only altered with supervisory consent and there is a failsafe process to ensure that they are reinstated before water quality is compromised c) revise and review CCP documentation to clearly state location, parameters, target criteria, monitoring frequency, critical limits, corrective actions and responsibilities for each CCP d) develop a process to record and document corrective actions, and preventive measures to reduce risks e) operational and critical limits must be set in SCADA as alarms, including delay times where appropriate.	We acknowledge the continual improvement in CCP management by Hunter Water. In practice these continual improvements contribute to the complexity in closing this recommendation. This recommendation remains open. To assist in the identification of any aspects still outstanding in the 2017-18 audit we make a further part to Recommendation 2013-14-02,03,04,06,13: f) For the 2017-18 audit Hunter Water should prepare a report (supported by detailed auditable evidence) that demonstrates the status of each part of the Recommendation 2013-14-02,03,04,06,13 for each system.
2013/14-14-12	Within 12 months, Hunter Water should review the following matters in respect to the Clarence Town Wastewater Treatment Works: • The effectiveness of the CCPs. If the corrective action can be undertaken in a timely manner, and it reduces risk, then implement the CCPs as soon as possible. • The risk assessment at Clarence Town Wastewater Treatment Works to take account of irrigation-water ponding at the site.	A risk assessment review was undertaken for Clarence Town Wastewater Treatment Works in May 2017 that considered irrigation-water ponding. Evidence was also provided for work undertaken to improve draining on irrigation areas to prevent ponding issues. It is proposed this recommendation be closed as the outstanding aspect associated with the CCP is included within Recommendation 2.2.1-2.
2013/14-20	Hunter Water should continue implementing the five improvement initiatives identified as part of its 2012 Benchmarking Program including: • develop a holistic approach to asset maintenance • the complete capture of all asset and related maintenance information in its Ellipse Asset/ Maintenance Management System. (It was noted that these initiatives should be fully implemented by July 2017, consistent with Hunter Water's *ISO 55001* implementation program).	Hunter Water has implemented improvements to its maintenance approach including redrafting of planned maintenance procedures, review of critical spares, monitoring planned maintenance completion and improving the planning and scheduling of civil planned maintenance. This recommendation is closed.

Recommendation	IPART's recommendation to the Minister	Progress
2014/15-01	It is recommended that Hunter Water commence the implementation of the interim CCPs as soon as possible and finalise validation program	For clarity we propose this recommendation is replaced by: **Recommendation 2.2.2-1:** By 30 September 2018 ensure the preventive measures for helminth control for agricultural sites (Karuah, Morpeth and Farley) achieve the required LRVs as per the AGWR
2014/15-02	It is recommended that Hunter Water finalise its validation program and facilitate endorsement of the outcomes by NSW Health. CCPs should then be adjusted or refined in accordance with the outcomes.	For clarity we propose the above recommendation is incorporated into : **Recommendation 2.2.1-2:** By 30 September 2018, Hunter Water should: – Develop a table in each scheme RWQMP that documents the evidence for the selection of the CCP, its associated monitoring parameter(s) and limits. This should include sufficient document control to capture when changes are made and the basis of those changes. – Consult with NSW Health on the validation testing program for the water recycling schemes. – Specify the performance required of the UV units in their operating context and determine whether they are achieving this performance. Any failure in the performance of prevalidated UV units should be further investigated.
2014/15-03	It is recommended that Hunter Water continues to fully implement improvement initiatives in respect of: • the development and implementation of a holistic approach to maintenance management • the complete capture of all asset and related maintenance information in its Enterprise Resource Planning (Asset/ Maintenance Management) System • criticality and condition assessment • review and update of operational and maintenance procedures across the whole of the asset portfolio.	We reviewed Hunter Water's approach to criticality and condition assessment. Hunter Water is still to implement a consistent approach to asset criticality and risk assessment across its asset classes and we therefore do not consider this part of the recommendation is closed. As this is one part of a larger recommendation with multiple parts, we suggest that this recommendation be replaced by Recommendation 4.1.2-1. **Recommendation 4.1.2-1:** By 30 June 2019 Hunter Water should fully implement an asset criticality and risk assessment approach that is consistent across all asset classes and consistent with the enterprise risk management framework.

Recommendation	IPART's recommendation to the Minister	Progress
2015/16-01	By 30 June 2017, review all system process flow diagrams including all process steps, inputs, monitoring points, key characteristics, handover points between parties and raw water customers, to ensure that: • each flow diagram matches the SCADA diagram, • each flow diagram and SCADA diagram is signed off by someone with appropriate authority, and • each flow diagram has associated version history and review cycle information.	Hunter Water has produced exemplary flow diagrams in response to this recommendation. The flow diagrams have been checked and signed off by persons with appropriate authority to do so. This recommendation is closed.
2015/16-02	By 30 June 2017, use the revised flow diagram to revise the risk assessment for Lemon Tree Passage Water Treatment Plant	The risk assessment was revised with the updated flow diagram. This recommendation is closed.
2015/16-03	By 30 June 2017, review and revise documentation associated with the emergency management process including: • Veolia's Crisis Management Plan, • cross-referencing in the Hunter Water Emergency Management Plan, and • the currency across all document history fields in Veolia's Incident Recording and Reporting procedure.	Documents have been updated and currency addressed. This recommendation is closed.
2015/16-04	By 30 June 2017, Hunter Water should review the implementation of recommendations from its Environmental Compliance Audit for the Karuah Effluent Reuse Enterprise, and develop appropriate deadlines for any recommendations that have not been addressed.	The outstanding recommendations from this period have been completed. This recommendation is closed.
2015/16-05	By 30 June 2018, Hunter Water should ensure that a gap analysis is completed of all RWQMPs, against the Framework for Management of Recycled Water Quality and Use. Particular focus should be given to the gaps in compliance areas detailed in the 2015-16 audit report.	Limited progress has been made on this recommendation. A spreadsheet was provided as evidence that records high-level compliance gaps from the 2015-16 audit report, but a review has not yet been undertaken against the Framework elements, components and actions. Given the additional gaps identified in this audit (2016-17), we propose Recommendation 2015/16-05 is updated to: By 30 June 2018, Hunter Water should ensure that a gap analysis is completed of all RWQMPs, against the Framework for Management of Recycled Water Quality and Use. Particular focus should be given to the gaps in compliance areas detailed in the 2015-16 and 2016-17 audit reports.
2015/16-06	By 31 December 2017, review the Asset Standards Management Plan and the Asset Class Management Plans, which were overdue for review. Ensure all Asset Class Management Plans meet Hunter Water's document control system.	The schedule detailing the status of revisions of the Asset Class Management Plans shows that 17 of 52 plans are yet to be updated. This recommendation remains open.
2015/16-07	By 30 June 2017, Hunter Water should ensure all compliance related documents are consistent with Hunter Water's procedure for managing document control.	This recommendation is closed.

This document is designed for double sided printing

Contents

Tables

Glossary

Item	Detail
Act	Generally refers to *Hunter Water Act 1991* (NSW)
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
ALARP	As low as reasonably practicable
ALS	Australian Laboratory Services
AGWR	AGWR (2006) Australian Guidelines For Water Recycling: Managing Health and Environmental Risks (Phase1). Natural Resource Management Ministerial Council, Environment Protection And Heritage Council, Australian Health Ministers' Conference. Web Copy: ISBN 1 921173 06 8
AOMS	Assets Operations Maintenance System
Aquality	WSAA's *Framework for Management of Drinking Water Quality* benchmarking tool.
AMCV	Asset Management Customer Value
AS	Australian Standard
AS/NZ ISO 9001	Quality Management Systems - Requirements (the Quality Management System) (2008)
AS/NZ ISO 19011	Guidelines for auditing management systems (2014)
AS/NZ ISO 14001	Environmental management system – Requirements with guidance for use (2004)
AS/NZS 4020	Australian and New Zealand Standards for testing of products for use in contact with drinking water
ASAE	Australian Standard on Assurance Engagements
ASAE 3100	Compliance Engagements issued by the Auditing and Assurance Standards Board (2017)
Audit Guideline	IPART (2016) *Public Water Utility Audit Guideline* (May 2016)
Audit Period	The dates of 1 July 2016 to 30 June 2017 over which Hunter Water's compliance is checked against certain clauses of its Operating Licence (as determined by IPART)
AWTP	Advanced Water Treatment Plant
BSI PAS 55:2008	Asset Management - Specification for the optimized management of physical assets
CCP	Critical control point (as defined in the Framework)
CT	Chlorine contact time
DNV-GL	Auditors Det Norske Veritas and Germanischer Lloyd
DW	Drinking Water
DWQMS	Drinking Water Quality Management System
DWQIP	Drinking Water Quality Improvement Plan
E. coli	*Escherichia coli*
EMP	Emergency Management Plan
EPA	NSW Environment Protection Authority
EPL	Environment protection licence
ERM	Enterprise Risk Management
Fluoride Code	New South Wales Code of Practice for Fluoridation of Public Water Supplies 2011 (Fluoride Code) (*Fluoridation of Public Water Supplies Act 1957* (NSW)) New South Wales Government Gazette No. 35
Framework	This term refers to either the *Framework for Management of Drinking Water Quality* or the *Framework for Management of Recycled Water Quality and Use*. Its meaning *in situ* depends on the context of the clause being assessed
FY	Financial year
GIS	Geographic information system
GRC	Governance, Risk and Compliance
HACCP	Hazard analysis and critical control point (as used by Hunter Water this is not a reference to the Codex Alimentarius International Food Standards)
HV	High voltage
HWC	Hunter Water Corporation
IMS	Integrated management system
IPART	Independent Pricing and Regulatory Tribunal of NSW
ISO	International Standards Organisation
ISO 55001	*ISO 55001:2014* Asset management - Management systems - Requirements
IT	Information Technology
LTP	Lemon Tree Passage
Licence	Hunter Water Corporation Operating Licence. The 2012-2017 licence was the focus of the audit. Hunter Water currently operates under a 2017-22 licence
LRV	Log reduction value
MD	Managing Director
MoU	Memorandum of Understanding

Item	Detail
NATA	National Association of Testing Authorities
NCR	Nonconformity Report
NSW Health	NSW Ministry of Health
NWI	National Water Initiative
PFOA/PFOS/PFAS	Human-made chemicals belonging to the group known as Per- and poly-fluoroalkyl substances (http://www.health.nsw.gov.au/environment/factsheets/Pages/pfos.aspx).
PD	Position descriptions
pH	A measure of the acidity of a solution related to the concentration of hydrogen ions.
PLC	Programmable Logic Controller
QMS	Quality Management System
REF	Review of Environmental Factors
Reporting Manual	Reporting Manual for Hunter Water Corporation Water — Reporting Manual June 2013 (IPART)
RW	Recycled Water
RWQMP	Recycled Water Quality Management Plan
SCADA	Supervisory Control and Data Acquisition
SHEQ	Safety, Health, Environment and Quality
SOP	Standard Operating Procedure
TRIM HP Records Management	A proprietary software system for managing documents and records.
UG	Unit Guide
UPG	Unit Process Guide
US EPA	United States Environmental Protection Agency
UV	Ultraviolet
UVT	Ultraviolet transmissivity
Veolia	Operation and maintenance of Water Treatment and Wastewater Treatment Facilities has been outsourced to Veolia
WAS	Waste activated sludge
WI	Work Instruction
WTP	Water Treatment Plant
WPS	Water Pumping Station
WQ	Water Quality
WSAA	Water Services Association of Australia
WWTW	Wastewater treatment works

1 Introduction

1.1 Objectives

The objective of this audit is to conduct an audit of Hunter Water Corporation's (Hunter Water or HWC) operations, consistent with audit requirements set out in IPART's *Audit Guideline Public Water Utilities* (May 2016), against:

- Hunter Water 2012-2017 Operating Licence
- *Hunter Water Act 1991*

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

1.2.1 Audit scope

The scope of the audit was:

- The operational licence clauses listed in Table 1-1. These clauses have been selected by IPART on a risk basis.
- Recommendation 2013-14-02,03,04,06,13: Water Quality Management Systems (2.1.1, 2.1.2, 2.2.1 & 2.2.2)
- Recommendation 2013/14-14-12: Recycled Water Quality Management System (2.2.2)
- Recommendation 2013/14-20: Asset Management System Condition (4.1.1)
- Recommendation 2014/15-01: Recycled Water Quality Management System (2.2.2)
- Recommendation 2014/15-02: Recycled Water Quality Management System (2.2.2)
- Recommendation 2014/15-03: Asset Management System Condition (4.1.1)
- Recommendation 2015/16-01: Drinking Water Quality Management System (2.1.1, 2.1.2)
- Recommendation 2015/16-02: Drinking Water Quality Management System (2.1.1, 2.1.2)
- Recommendation 2015/16-03: Drinking Water Quality Management System (2.1.1, 2.1.2)
- Recommendation 2015/16-04: Recycled Water Quality Management System (2.2.1, 2.2.2)
- Recommendation 2015/16-05: Recycled Water Quality Management System (2.2.1, 2.2.2)
- Recommendation 2015/16-06: Asset Management System implementation (4.1.2)
- Recommendation 2015/16-07: Performance monitoring - Maintain record systems (8.2.2)

This audit covers the 2016-2017 financial year.

Table 1-1. Licence sections within the 2016-17 audit scope

Section	Clause	Sub clauses
2. Water quality	2.1. Drinking water	2.1.1, 2.1.2, 2.1.3, 2.1.4
	2.2. Recycled water	2.2.1 , 2.2.2, 2.2.3, 2.2.4
4. Assets	4.1 Asset Management System	4.1.1, 4.1.2, 4.1.3
6. Environment	6.1 Environmental Management	6.1.1, 6.1.2, 6.1.3
7. Quality	7.1 Quality Management System	7.1.1, 7.1.2, 7.1.3
8. Performance monitoring	8.2 Reporting	8.2.2

1.2.2 Audit standard

In conducting this audit, the auditors are following IPART's *Audit Guideline Public Water Utilities* (May 2016).

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

- *AS/NZ ISO 19011:2014 Guidelines for auditing management systems*
- *ASAE 3100 (2017) Compliance Engagements* issued by the Auditing and Assurance Standards Board
- *AS/NZS ISO 9001:2016: Quality management systems* – Requirements
- *ISO 55001:2014 Asset Management System* – Requirements

1.2.3 Audit team

The audit team and audit qualifications are provided in Table 1-2.

Table 1-2. Audit team members and their qualifications

Team Member	Details
Dr Annalisa Contos **Atom Consulting**	Dr Annalisa Contos holds the following auditor qualifications: 1. Registered Exemplar Global lead auditor (Certificate No. 113465): a. Exemplar Global -DW (Drinking Water) b. Exemplar Global -RW (Recycled Water) c. Exemplar Global TL-AU (Lead Auditor) d. Skill Examiner 2. NSW IPART (Independent Pricing and Regulatory Tribunal) qualified: a. Lead Auditor and Area Specialist Drinking Water Quality b. Lead Auditor and Area Specialist Licence and Regulatory Compliance c. Lead Auditor and Area Specialist Infrastructure Performance d. Lead Auditor and Area Specialist Recycled Water Quality e. Lead Auditor and Area Specialist Sewage Management f. Area Specialist Environmental Management
Dr Annette Davison **Risk Edge™**	Dr Annette Davison holds the following auditor qualifications: 1. Moderating Auditor, registered by the Water Services Association of Australia (WSAA) with skills to use the WSAA "Aquality" benchmarking tool 2. Registered Exemplar Global lead auditor (Certificate No. 12454): a. Exemplar Global-DW (Drinking Water) b. Exemplar Global TL-AU (Lead Auditor) c. Certified *ISO 22000* competency from NCSI (Food Safety Management Systems) 3. NSW IPART (Independent Pricing and Regulatory Tribunal) qualified: a. Lead Auditor and Area Specialist Drinking Water Quality b. Lead Auditor and Area Specialist Recycled Water Quality c. Lead Auditor and Area Specialist Sewage Management d. Lead Auditor and Area Specialist Environmental Management e. Lead Auditor Licence and Regulatory Compliance f. Auditor Retail Supply

Team Member	Details
Stephen Walker **Cardno**	Mr Stephen Walker holds the following auditor qualifications: 1. World Partners in Asset Management *Certified Asset Management Assessor No. 59 (www.wpiam.com)*. This accreditation demonstrates compliance with I*SO 17021-5 Competence requirements for auditing and certification of asset management system.* 2. Registered Exemplar Global lead auditor (Certificate No. 638040): a. Exemplar Global TL-AU (Lead Auditor) b. Exemplar Global -DW (Drinking Water) 3. NSW IPART (Independent Pricing and Regulatory Tribunal): a. Lead Auditor and Area Specialist Infrastructure Performance b. Lead Auditor Licence and Regulatory Compliance c. Lead Auditor and Area Specialist Sewage Management d. Lead Auditor and Area Specialist Retail Supply
Natalie Crawford **Atom Consulting**	Natalie Crawford holds the following auditor qualifications 1. Registered Exemplar Global auditor (Certificate No. 130608): a. Exemplar Global -DW (Drinking Water) b. Exemplar Global -RW (Recycled Water) c. Exemplar Global -AU (Auditor)

1.2.4 Audit grades

The audit grade definitions used in assessing the auditee's performance against the requirements are set out in Table 1-3.

Table 1-3. Audit grades

Audit finding	Description
Full compliance	Sufficient evidence to confirm that the requirements have been fully met.
High compliance	Sufficient evidence to confirm that the requirements have generally been met apart from **very few minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Adequate compliance	Sufficient evidence to confirm that the requirements have generally been met apart from **a number of minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Non-compliant	Sufficient evidence has **not** been provided to confirm that all major requirements are being met and the deficiency adversely impacts the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
No requirement	The requirement to comply with the licence condition does not occur within the audit period or there is no requirement for the utility to meet this assessment criterion.

Source: *Audit Guideline Public Water Utilities (IPART May 2016)*

1.3 Regulatory regime

Hunter 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 Hunter Water is provided in Table 1-4.[1]

Table 1-4. Key legal and formal instruments relevant to Hunter Water's operating licence[2]

Instrument	Relevance
Annual Reports (Statutory Bodies) Act 1984 (NSW)	Applies to reporting requirements of Hunter Water
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 including drinking water and recycled water.
Current versions of the Australian Drinking Water Guidelines and the Australian Guidelines for Water Recycling	These guidelines are called up under Hunter Water's Operating Licence obligations.
Fluoridation of Public Water Supplies Act 1957 (NSW)	Together with the current Fluoride Code, this Act sets out obligations for utilities fluoridating public water supplies. Hunter Water has a requirement to comply with the Code in its Operating Licence.
Government Information (Public Access) Act 2009 (NSW)	Information may be requested from Hunter Water, which relates to aspects of the licence.
Hunter Water Act 1991 (NSW)	An Act which establishes Hunter Water as a corporation.
Hunter Water Operating Licence 2012-2017	A licence issued by IPART NSW, which enables Hunter Water to provide relevant services within its area of operations. This licence also gives effect to the operational audits (this audit) to which Hunter Water is subject.
Independent Pricing and Regulatory Tribunal Act 1992 (NSW)	Allows for the regulation of utilities such as Hunter Water including the administration and auditing of licences and pricing functions.
Memorandum of Understanding with NSW Health 2013	Sets out the working relationship between NSW Health and Hunter Water.
Protection of the Environment Operations Act 1997 (NSW)	This Act sets out the environmental operating context for Hunter Water including, where relevant, the need to gain and operate under an Environmental Protection Licence (EPL) for its facilities.
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. Hunter Water has obligations under this Act including notifying the Minister of any situation that is likely to be a risk to public health.

[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.

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 across the audit team. 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 Clause 2 Water Quality

2.1 Summary of findings

2.1.1 Clause 2.1 Drinking water

Clause 2.1.1 – Adequate compliance

Clause 2.1.2 – Adequate compliance

Clause 2.1.3 – Full compliance

Clause 2.1.4 – Full compliance

As well as interviewing personnel at Hunter Water's head office, we also visited the Paterson River offtake (Gresford Water Pumping Station) and the Gresford Water Filtration Plant, Elermore Vale reservoir and Wallsend Water Pumping Station. We would like to note that personnel were courteous, knowledgeable and well-prepared and records exemplary. We would also like to commend Hunter Water on the diligence and organisation applied to the provision of evidence.

As appropriate for this clause, the auditors used the Framework for Management of Drinking Water Quality in the Australian Drinking Water Guidelines to test consistency (adequacy) and implementation of systems and processes.

We would like to note the good progress Hunter Water has made in addressing shortcomings identified in earlier audits and in progress to closing out recommendations. In addition, we would like to commend Hunter Water on producing an exemplary set of flow diagrams for Framework Element 2 requirements. However, the Four Mile Creek chlorinator self-reported CCP non-compliance has caused a number of shortcomings over several Framework elements for clauses 2.1.1 and 2.1.2.

For clarity we have noted the Four Mile Creek shortcomings in Table 2-1 and cross referenced these in the sections below where relevant. Hunter Water had systems in place that eventually picked up the issue and public health was not compromised (Hunter Water was found to be generally meeting requirements) – therefore we assessed the incident as being a 'shortcoming' in nature rather than a 'non-compliance'.

Even though for the whole of the Framework, several of the elements were assessed as achieving 'high' rather than 'full' compliance for clauses 2.1.1 and 2.1.2, the shortcomings in total roll up to 'a number of minor shortcomings', which, based on IPART's audit grades, puts both clauses into 'adequate' compliance overall.

Table 2-1. Element-by-element impacts of the reported CCP non-compliance

Issue noted	Clause 2.1.1	Clause 2.1.2
Water quality awareness training is in place but there is a gap in ensuring training for specific procedures and undertaking that training, in particular, what constitutes a chlorinator CCP exceedance and the actions required in the event of that exceedance. We note that Hunter Water has undertaken some training since the incidents occurred and will complete the training within the 2017-18 reporting period. Therefore no recommendation is included for this shortcoming.	Element 7	Element 7
The chlorinator CCP is in place, but procedures and information in SCADA were insufficient in detail to support correct operation of the CCP. We note that Hunter Water has updated process and SCADA information relating to CCPs to mitigate this shortcoming and therefore, no recommendation has been made.	Element 4	

Issue noted	Clause 2.1.1	Clause 2.1.2
There is a process in place for reporting a CCP exceedance, but it was not implemented in the time required on four occasions. Hunter Water has updated SCADA and added an automatic email notification to the Water Network Operation team on critical limit exceedance. However, a review of the incident may indicate necessary amendments to existing protocols,[3] it is not clear if Hunter Water has undertaken this review. A recommendation has been made to address this shortcoming.		Element 6 Element 10
There is nothing in the incident response form in Integrum that triggers a review of incident procedures, either on incident type or incident frequency. A recommendation has been made to address this shortcoming.	Element 6	

Clause 2.1.1

Clause 2.1.1 requires Hunter Water to maintain a management system that is consistent with the Australian Drinking Water Guidelines or any other amendment or addition required by NSW Health. NSW Health had no other requirements.

Detailed assessment in respect of this clause is presented in Table B-3. A summary of the findings is presented below in Table 2-2.

Table 2-2. Element-by-element summary of findings for clause 2.1.1.

Element	Grade	Key Findings
1: Commitment to Drinking Water Quality Management	Full	A drinking water quality policy is in place and current. Regulatory and formal requirements are in place with a procedure for updating requirements. Stakeholders are identified and engagement processes are in place.
2: Assessment of the Water Supply System	High	A process is in place for preparing inputs to the risk assessment including flow diagrams and water quality data analysis and for undertaking rolling risk assessment reviews. A process is in place for assembling a water quality risk assessment team from relevant personnel including Hunter Water and the treatment operations contractor. Water Quality Committee terms of reference are in place and maintained. A risk assessment framework is in place. Field verification of flow diagrams was verbally confirmed for the Lemon Tree Passage WTP and corroborated by evidence to show retiring of risks in the risk assessment after revision using the updated flow diagram. One minor shortcoming was identified in consistency with the formal requirement to field verify the flow diagrams i.e. no formal requirement could be found which requires field verification of the flow diagrams.
3: Preventive Measures for Drinking Water Quality Management	High	There is a process in place to identify preventive measures in assessing residual risk. There is a process in place to capture and act on actions from the risk assessment. There is an ongoing process in place to develop Framework consistent CCPs, with review of CT limits as an ongoing action. There is a formal process to involve NSW Health in CCP development. NSW Health notes that significant progress in the review of critical limits has been made, although further work is required to complete CCPs to its satisfaction and for consistency with the ADWG. This element has been found to have high compliance due to CCPs not yet being finalised.

[3] Element 6, component 2, action 3 (A 6.2.3): Investigate any incidents or emergencies and revise protocols as necessary.

Element	Grade	Key Findings
4: Operational Procedures and Process Control	High	Operational procedures and processes are generally in place with evidence provided of WTP operating manuals and HACCP response plans. Operational monitoring is documented in the Drinking Water Quality Plan and HACCP tables for each WTP. An issue was noted concerning procedures and information in SCADA as a result of the self-reported Hunter Water CCP non-compliance at the Four Mile Creek chlorinator. Refer to Table 2-1 for further information.
5: Verification of Drinking Water Quality	Full	A verification monitoring program is in place (documented in the Drinking Water Quality Monitoring Plan) with evidence provided for Gresford WTP. A process is in place for consumer complaints and response, including a system of training of front line staff. Procedures are in place to review water quality data and notification protocols for exception reporting.
6: Management of Incidents and Emergencies	High	Communication and incident and emergency management protocols are in place. A requirement exists to undertake emergency scenario training every two years. The Water Quality Committee is tasked with reviewing water quality exceptions and variations including corrective action efficacy. Hunter Water self-reported a non-compliance for incident management of CCP chlorinator breaches at the Four Mile Creek chlorinator. Refer to Table 2-1 for further details.
7: Employee Awareness and Training	High	Good processes are in place for ensuring employee awareness and involvement across the organisation as well as the water treatment contractor. Solid training programs and learning and development support personnel are in place. This element receives a 'noteworthy effort' for consistency in overarching water quality awareness. However, we found some shortcomings associated with the training for management of the chlorinator CCP (see Table 2-1).
8: Community Involvement and Awareness	Full	A dedicated community and stakeholder team is in place. A Community Consultative Forum exists and occurs three times a year. Hunter Water is in the process of formalising stakeholder and community engagement in a Stakeholder Engagement Standard and Procedure with customers and stakeholder engagement covered by the 2017+3 Strategy, for the audit date scope.
9: Research and Development	Full	Programs have been established to increase system understanding, and are documented in Hunter Water's 4 year research and development plan and register. Systems are in place to validate and revalidate processes, and are documented in Hunter Water's Design Validation Guideline document.
10: Documentation and Reporting	Full	Systems are in place for the management of documents and records (for Hunter Water and the treatment contractor) which are consistent with Framework requirements. Personnel are trained in how to use the systems. A corporate compliance calendar and register are in place to track reporting requirements.
11: Evaluation and Audit	Full	Formal audit procedures and schedules are in place including formal avenues for review of findings.
12: Review and Continual Improvement	Full	Hunter Water and the treatment contractor have formal processes in place for review of the management system. A Drinking Water Quality Management Improvement Plan is in place with systems to support its implementation. The treatment contractor has a formal innovation process in place.

Clause 2.1.2

Clause 2.1.2 requires Hunter Water to ensure that the Drinking Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the system, including to the satisfaction of NSW Health.

Detailed assessment in respect of this clause is presented in Table B-3. A summary of the findings is presented below in Table 2-3.

Table 2-3. Element-by-element summary of findings for clause 2.1.2

Element	Grade	Key Findings
1: Commitment to Drinking Water Quality Management	Full	Awareness of the drinking water quality policy is in place and was on display at the field audit sites. Drinking water quality awareness training is undertaken in practice (see Element 7). Legal and formal requirements are updated periodically according to the procedure. Position descriptions and training are used to capture responsibilities. Evidence to confirm engagement with stakeholders in practice (internal and external) was sighted (see also Element 8).
2: Assessment of the Water Supply System	Full	Preparation of risk assessment inputs is implemented through briefing papers prepared for each risk assessment workshop. Papers contain summaries of legal and formal requirements, system information, flow diagrams and water quality data analyses. Updated flow diagrams are in place (see Recommendation 15/16-01 for more information). Workshop output papers (including attendees) and updated risk registers are available as evidence of risk review completion. Minutes are evidence of the Water Quality Committee meetings. Evidence was provided to confirm site verification for the Lemon Tree Passage WTP in practice.
3: Preventive Measures for Drinking Water Quality Management	Full	Evidence was provided of CCP implementation. Even though the CT CCP was noted as being interim, it is implemented in practice. The self-reported Hunter Water non-compliance for the CCP chlorinator exceedances at the Four Mile Creek chlorinator are captured in other elements.
4: Operational Procedures and Process Control	Adequate	Operational procedures and processes are in place with evidence provided of WTP operating manuals and HACCP response plans. Processes for operational monitoring are in place and CCPs are monitored and controlled using SCADA. Not all SCADA system limits have been updated. Hunter Water noted that updates to the Treatment Operations Contract Practice Note PN111 and critical limit alarm in SCADA are being updated in the 2017-18 financial year. Elermore Vale Reservoir field audit revealed shortcomings with the inspection process resulting in a potential exposure pathway for water contamination not being identified for a number of months.
5: Verification of Drinking Water Quality	Full	Evidence was provided to confirm implementation of the verification monitoring program. Monthly water quality summaries, exception reports and water quality committee meetings ensure that review and analysis of verification monitoring data are undertaken.
6: Management of Incidents and Emergencies	Adequate	Evidence was provided to show that the communication and incident and emergency management protocols in place are generally implemented in practice. An emergency training scenario had been completed during the audit date scope (which shows that emergency training is undertaken) however, the scenario was not for a water quality incident so this specific emergency scenario could not be tested. We were advised that no procedures had been revised as a result of debriefs. In its 2016-17 Statement of Compliance, Hunter Water noted that the reporting non-compliance for the Four Mile Creek CCP breach did not trigger a review of the emergency and incident procedures as one of the remedial actions. The four non-compliances should also have triggered a review of the emergency and incident procedures. We have provided a recommendation to review emergency and incident procedures based on the CCP breach as well including a CCP breach as a future emergency training scenario. Refer also to Table 2-1.

Element	Grade	Key Findings
7: Employee Awareness and Training	High	Evidence was provided to show that training and awareness is implemented in practice for both the organisation and the water treatment contractor. Records were provided to demonstrate training including in awareness and required job competencies. Budget information was provided to demonstrate that training had been well-resourced within the audit period. This element receives a 'noteworthy effort' for implementation of overall water quality awareness training. However, we found some shortcomings associated with the training for management of the chlorinator CCP (see Table 2-1).
8: Community Involvement and Awareness	Full	Evidence was sighted to demonstrate implementation of the community involvement and awareness programs including catchment management brochure, social media examples and information relating to current issues including PFOA/PFAS.
9: Research and Development	Full	Evidence was provided of research and development partnerships and investigation studies being undertaken. Veolia provided evidence of processes for innovation and improved efficiencies and reporting to Hunter Water. Hunter Water provided a range of evidence to support implementation in this area including a revised CCP critical limit for pH and a Disinfection Optimisation Strategy to improve the persistence of chlorine residual for effective disinfection in the distribution system.
10: Documentation and Reporting	Adequate	Documentation and reporting is generally implemented in practice. However during the audit date scope, a series of reporting non-compliances occurred. We feel that the non-compliance of reporting represents a number of minor shortcomings as, although there was no impact on public health, it was an event that happened on four occasions and is therefore awarded adequate compliance.
11: Evaluation and Audit	Full	Audits are undertaken in practice for Hunter Water and its contractors. Audit reports confirmed that audits occurred. Evidence was provided to demonstrate how results are reviewed by relevant senior personnel.
12: Review and Continual Improvement	Full	Evidence was provided to show how the system is reviewed by senior management. The Drinking Water Quality Management Plan is in place and implemented in practice. To test the overall process, we requested and were provided with information to show how Hunter Water and the treatment contractor had worked together to identify and remediate issues associated with turbidity meters at Grahamstown WTP. The approach and records demonstrate a noteworthy effort, showing an effective partnership between the contractor and Hunter Water and implementation of improvement in practice.

Clause 2.1.3

Clause 2.1.3 requires Hunter Water to notify IPART and NSW Health of any significant changes that it proposes to make to the Drinking Water Quality Management System in accordance with the Reporting Manual.

We were able to confirm that Hunter Water had informed both NSW Health and IPART of the proposed pH critical limit changes to the Drinking Water Quality Management System as required by this clause. We note that while formal evidence was provided for discussion of proposed changes with NSW Health, we were only able to confirm notification of proposed changes through discussion with IPART. IPART confirmed that it had been aware of discussion between NSW Health and Hunter Water prior to the change occurring. We confirmed that Hunter Water formally notified IPART of the change in March 2017. Detailed assessment in respect of this clause is presented in Table B-5.As such, we are satisfied that this clause achieves full compliance.

Clause 2.1.4

Clause 2.1.4 requires Hunter Water to obtain NSW Health's approval for any significant changes proposed to be made to the Drinking Water Quality Management System before implementing or carrying out its activities in accordance with them.

Detailed assessment with respect to this clause is presented in Table B-6.

As noted under clause 2.1.3, Hunter Water sought and received NSW Health's approval for the CCP critical limit changes and progress on finalising CCPs. These items represent significant changes to the Drinking Water Quality Management System. This clause is considered fully compliant.

2.1.2 Clause 2.2 Recycled water

Clause 2.2.1 – Adequate compliance

Clause 2.2.2 – Adequate compliance

Clause 2.2.3 – Full compliance

Clause 2.2.4 – High compliance

As well as interviewing personnel at Hunter Water's head office, we also visited the Kurri Kurri WWTW. As appropriate for this clause, the auditors used the Framework for Management of Recycled Water Quality in the Australian Guidelines for Water Recycling (AGWR) to test consistency (adequacy) and implementation of systems and processes.

Clause 2.2.1

Hunter Water manages its recycled water through a hierarchy of documents supported by its Integrated Management System (IMS). The Corporate RWQMP is a roadmap for the recycled water management system, structured according to the elements, components, and actions set out in the AGWR *Framework for management of recycled water quality and use*. This corporate RWQMP is supported by scheme specific RWQMPs and supporting documentation. During the audit, we focussed on Kurri Kurri WWTW scheme.

We acknowledge the significant effort Hunter Water has undertaken in the development of the RWQMP including the corporate and specific documents. This approach ensures consistency between the schemes while allowing the approach to be tailored to meet specific requirements of each scheme.

The Corporate RWQMP makes a number of statements regarding activities that will be done, rather than what is currently being undertaken. There are also a number of circumstances where the corporate and site specific RWQMPs each states that the required actions are documented in the other RWQMP. Across some aspects of the recycled water management system there were a number of minor shortcomings that did not result in identified public health or environmental impacts during the audit period. These gaps should be identified as part of the work associated with Recommendation 2015/16-05.

Generally, there was good alignment between the requirements of this clause and Hunter Water's compliance. Key findings are documented in Table 2-4.

Table 2-4. Element-by-element summary of findings for clause 2.2.1.

Element	2.2.1	Key Findings
1: Commitment to responsible use and management of recycled water quality	Full	Processes are in place to document responsible uses of recycled water, regulatory and formal requirements and partnerships and engagement with stakeholders. There is an appropriate structure for the documentation and the management of stakeholders and their obligations.
2: Assessment of the Recycled Water System	High	A process is in place for preparing for and undertaking risk assessment reviews, with a schedule of risk assessments provided. Issues were noted with currency of language in the Corporate RWQMP for this element. No evidence was provided for the requirement of field verification of the process flow diagrams.
3: Preventive Measures for Recycled Water Management	High	Processes are in place for identifying preventative measures as part of the scheme specific risk assessments. Processes to identify CCPs are documented within the Hunter Water *Establishment and Review of Recycled Water CCP* standard. It was noted that the basis for determining CCPs is not well established within the documentation particularly in regard to alignment with the validation program undertaken, this is further discussed under Element 9.
4: Operational Procedures and Process Control	Full	Operational procedures and processes are generally in place with evidence provided of a Veolia operating manual for Kurri Kurri WWTW. Processes for operational monitoring and corrective actions are documented in the WWTW RWQMPs.
5: Verification of Recycled Water Quality and Environmental Performance	Full	A verification monitoring program is in place with evidence provided for Kurri Kurri WWTW. A process is in place for consumer complaints and response, including a system of training of front line staff. Veolia procedures are in place to review water quality data and notification protocols from Veolia to Hunter Water and Hunter Water to NSW Health for exception reporting.
6: Management of Incidents and Emergencies	Full	Communication and incident and emergency management protocols are in place, with evidence provided for both Hunter Water and Veolia's systems, including documentation of notification protocols.
7: Operator, Contractor and End User Awareness and Training	Full	Mechanisms for operator, contractor and end users training and awareness are documented within the Corporate RWQMP. Measures to increase employee awareness include training, risk assessment workshop and recycled water quality committee meetings. Training requirements/obligations for end users are outlined in the end user agreements, with evidence provided for Kurri Kurri TAFE, which states that general induction training must be undertaken by end users.
8: Community Involvement and Awareness	Full	Hunter Water have an overarching Stakeholder Engagement Standard that governs how recycled water consultation is managed, with recycled water specific details included in the corporate RWQMP.
9: Validation, Research and Development	Adequate	The RWQMP includes processes for validation, revalidation, and research and development, however we noted gaps with a circular reference in both the corporate RWQMP and site specific RWQMP referring to each other. The process for validation of critical limits is not well described, including a lack of documented justification for the selection of monitoring parameters and critical limits.

Element	2.2.1	Key Findings
10: Documentation and reporting	Full	There are established procedures for the management of documentation and records for both Hunter Water and Veolia. There are established procedures for external and internal reporting from Veolia to Hunter Water and from Hunter Water to agencies and end users. A potential gap exists regarding how soil, ground water and surface water monitoring at end user sites and water quality trends are identified and reported on an annual basis. However this gap was graded in Element 11.
11: Evaluation and Audit	High	A process is in place for audits and for evaluation of data in advance of risk assessment. The corporate RWQMP proposes that an annual review be undertaken, however this is written in the future tense. A few minor issues were also noted with the annual inspection reports.
12: Review and Continuous Improvement	Full	There is a high-level recycled water quality improvement plan in place, that includes branch accountability, timelines and status tracking. Processes are in place for review by senior management as part of the 6 monthly IMS review meeting and quarterly water quality meetings.

Clause 2.2.2

This clause requires Hunter Water to fully implement the RWQMP developed as a requirement of Clause 2.2.1. Hunter Water must undertake all relevant activities in accordance with the system and NSW Health must be satisfied these requirements have been discharged.

A number of minor shortcomings were identified and are summarised in Table 2-5. We would like to commend Hunter Water for the following aspects:

- Documentation of the operation and maintenance associated with end user hand over points was industry best practice
- Monthly WWTW management reporting by Veolia was well-balanced, being both clear and comprehensive
- The collaborative nature of the relationship ('best for project') between Veolia and Hunter Water was noted as being a key factor of the successful implementation of a risk based approach to recycled water management

Overall, there was adequate implementation of the recycled water quality management system.

Table 2-5. Element-by-element summary of findings for clause 2.2.2.

Element	2.2.2	Key Findings
1: Commitment to responsible use and management of recycled water quality	High	The recycled water policy is current with the policy approved by the Managing Director in June 2017. The end user handover points were well documented, with clear descriptions, pictures and maps included in the Recycled Water Asset Construction and Maintenance Standard. Minor aspects relating to the regulatory and formal requirements component of this element were noted.
2: Assessment of the Recycled Water System	High	Four risk assessments were undertaken in the audit period. Appropriate attendance of regulatory stakeholders was noted. The field audit identified some inaccuracies in the Kurri Kurri WWTW recycled water process schematic. The risk assessments were undertaken at a high level and it was difficult to confirm the level of detail considered in the workshop from the risk register and subsequent follow up actions.
3: Preventive Measures for Recycled Water Management	Adequate	Preventive measures are documented in scheme specific RWQMPs and risk assessment, with evidence provided of a number of risk assessments. Not all CCPs were entered into SCADA in the audit period, though request for SCADA changes had been noted in the SCADA change registers.

Element	2.2.2	Key Findings
		The LRVs reported in the *Validation Testing Program* for the three samples taken across the UV units from Kurri Kurri WWTW and Cessnock WWTW did not support the selection of these unit processes as critical control points (less than 0.1 LRV for viral, protozoan and bacterial surrogates for Cessnock WWTW and 0.3 LRV for protozoan and 0.4 LRV for bacterial surrogates for Kurri Kurri WWTW).
4: Operational Procedures and Process Control	Full	Operational procedures and processes are in place with evidence provided of Veolia's Kurri Kurri WWTW operating manual. Evidence of operational monitoring was provided with the Kurri Kurri WWTW plant spreadsheet. Issues were noted for CCP limits not entered into SCADA in the audit period for some WWTWs. This is covered under Element 3. Reporting in the Veolia Contract Monthly Reporting was well done.
5: Verification of Recycled Water Quality and Environmental Performance	Full	Evidence was provided of verification water quality monitoring data for Kurri Kurri WWTW. Details of recycled water quality exception reports are provided to NSW Health in a quarterly water quality exception report and the results discussed at the quarterly Water Quality meeting. Veolia provided a comprehensive monthly contractor report that included recycled water performance.
6: Management of Incidents and Emergencies	Full	Evidence was provided of two incidents that occurred at Kurri Kurri WWTW, including notification to NSW Health and records of verbal notification to end users. We did however note that the Integrum incident form was marked as 'draft'. To avoid double counting this is graded in Element 11.
7: Operator, Contractor and End User Awareness and Training	Full	Evidence was provided of Hunter Water and Veolia staff training on recycled water management systems. We saw evidence that induction training is included in end user site management plans, however the annual inspection undertaken by Hunter Water of end users did not check records of induction training.
8: Community Involvement and Awareness	Full	Evidence was provided of the end user customer agreements, annual inspection reports for Kurri Kurri TAFE and Kurri Kurri Golf Club and a screen shot of the recycled water section of Hunter Water's website.
9: Validation, Research and Development	Adequate	Evidence of validation is documented in the Recycled Water Scheme Validation Report. There are a number of aspects associated with the preventative barriers, their validation and verification that remain unresolved. These include UV units not working as expected, the basis behind CCP validation and end user treatment processes (refer to Table B-11). Actions are outstanding for implementing helminth preventative measures for those sites that supply to farms operating with livestock.
10: Documentation and reporting	Full	We were provided evidence of comprehensive monitoring undertaken by Veolia as part of its contractor monthly reports. The document management system was audited. Where requested documents and records could be found and were provided by both Hunter Water and Veolia.
11: Evaluation and Audit	Adequate	There were a number of minor shortcomings noted in the implementation of this element. These include that internal audits and annual reviews were not all undertaken according to schedule and there was no reporting of the annual water quality review.
12: Review and Continuous Improvement	Full	A recycled water quality improvement plan was provided that documents actions and status of actions. Only one action was not completed within the audit scope period due date, which was noted as an ongoing improvement and is further discussed as part of Recommendation 2.2.2-1. An internal audit was undertaken of Element 1 recommending updating the recycled water quality policy, which was subsequently updated by the new Managing Director. Water quality actions are also tracked through recycled water monthly meetings held between Veolia and Hunter Water.

Clause 2.2.3

This clause requires Hunter Water to report according to its Reporting Manual as part of its Operating Licence requirements. Hunter Water advised IPART in its letter dated 31st March 2017 that significant changes to its recycled water quality management system had occurred, included a review of the CCPs associate with recycled water quality and where necessary the RWQMPs.

Hunter Water notes that changes to the Recycled Water Quality Management Plans (RWQMPs) are reviewed at its monthly Water Quality Committee meetings and that the significance of changes are discussed at those meetings. As discussed in Clause 2.1.3 we reviewed the Water Quality Committee terms of reference and consider this overarching statement adequate for capturing the requirements of this clause. A discrepancy was noted in its annual performance report to IPART that is discussed in Clause 2.2.4.

Clause 2.2.4

This clause requires that Hunter Water seeks NSW Health's satisfaction for changes to the RWQMPs. There is evidence of NSW Health's engagement with the process of updates to RWQMPs, however evidence was not seen that NSW Health had provided approval for these changes prior to implementation or undertaking of associated activities. This clause is considered high compliance.

In relation to notifying IPART of proposed significant changes, we were able to sight formal evidence of notification of proposed changes to IPART.[4] We note this was not in accordance with the reporting of significant changes in the Annual Performance Report to IPART, which states:

> *No significant changes to the recycled water quality management system were made during 2016-17*

NSW Health 10 March 2017 letter to Hunter Water expressed satisfaction with the status of the review and update program for RWQMPs, rather than the current status of the RWQMPs as reported in the letter to IPART Report on Significant Changes. [4]

2.2 Recommendations

Recommendations for clause 2 are shown in Table 2-6.

Table 2-6. Clause 2 recommendations.

Sub clause	Recommendation
Clause 2.1.1	**Recommendation 2.1.1-1:** To avoid repetition of incidents, ensure that a system is in place (e.g. through the functions of the Water Quality Committee) to check incidents for trends and flag any that have happened previously (by 30 September 2018)
Clause 2.1.2	**Recommendation 2.1.2-1:** By 30 September 2018, ensure that all emergency and incident management procedures are reviewed, and revised if necessary, based on the Four Mile Creek CCP reporting breach (July 2016 and June 2017). **Recommendation 2.1.2-2:** For the next scheduled emergency scenario training exercise, include a CCP breach as the example. **Recommendation 2.1.2-3:** By 30 September 2018, ensure that all personnel involved in undertaking reservoir inspections undertake training in the importance of accurately completing the reservoir inspection forms, including the records associated with the inspection
Clause 2.1.3	There are no recommendations for clause 2.1.3 but we note that CCP-related recommendations are ongoing and are addressed under Element 3 of clause 2.1.1 and 2.1.2 and the findings on existing recommendations within this report.
Clause 2.2.1	**Recommendation 2.2.1-1:** By 30 December 2018 Hunter Water should update the Corporate RWQMP to document current activities and processes. This should include filling any gaps identified as part of Recommendation 15/16-05. **Recommendation 2.2.1-2:** By 30 September 2018, Hunter Water should: – Develop a table in each scheme RWQMP that documents the evidence for the selection of the CCP, its associated monitoring parameter(s) and limits. This should include

[4] REPORT ON SIGNIFICANT CHANGES TO OPERATING LICENCE - HWC - Jim Bentley.pdf (31/3/17) and STATUS OF RECOMMENDATIONS-2015-16 OPERATIONAL AUDIT - HWC - Jim Bentley.pdf (31/3/17).

Sub clause	Recommendation
	sufficient document control to capture when changes are made and the basis of those changes. – Consult with NSW Health on the validation testing program for the water recycling schemes. – Specify the performance required of the UV units in their operating context and determine whether they are achieving this performance. Any failure in the performance of prevalidated UV units should be further investigated.
Clause 2.2.2	**Recommendation 2.2.2-1:** By 30 September 2018 ensure the preventive measures for helminth control for agricultural sites (Karuah, Morpeth and Farley) achieve the required LRVs as per the AGWR

2.3 Opportunities for improvement

Opportunities for improvement for clause 2 are shown in Table 2-7.

Table 2-7. Clause 2 opportunities for improvement

Sub clause	Opportunities for improvement
2.1.1 and 2.1.2	**OFI 2.1.1 E3-1:** Review whether the booster chlorinators should be defined as a critical control point and if Hunter Water chooses to keep them as a CCP, review the appropriateness of the upper limit. **OFI 2.1.2 E2-1:** Ensure that at the next review, all risk assessments use the revised flow diagrams. **OFI 2.1.2 E4-1:** At the next review, ensure that all water treatment plant operating manuals include the revised flow diagrams. **OFI 2.1.2 E4-2:** Develop and implement a formal approach to changing over the raw water input for the Gresford Water Treatment Plant between the Allyn and Paterson River sources. **OFI 2.1.2 E4-3:** Ensure that the person writing notes in the plant diary identifies themselves against their entry to confirm responsibility. **OFI 2.1.2 E7-1:** Given recent drinking water contamination incidents including Havelock North (NZ) and Flint (Mi, USA), consider having a requirement for refresher water quality awareness training after a given period of time (with updated case studies). **OFI 2.1.2 E7-2:** Consider whether it would be useful to require staff and contractors to undergo fluoride refresher training (given that the certificate reviewed as evidence was for certification achieved more than 20 years ago). **OFI 2.1.2 E11-1:** Formalise the DWQMS auditing requirements in the Internal Audit Schedule (other than those in the contract) for the treatment operations contractor.
2.2.1	**OFI 2.2.1-1:** Consider reviewing the annual inspection report, to include receiving environment monitoring
2.2.2	**OFI 2.2.2-1:** Ensure appropriate people are included in risk assessments e.g. end users

3 Clause 4 Assets

3.1 Summary of findings

3.1.1 Clause 4.1 Asset management system

Clause 4.1.1 – Full compliance

Clause 4.1.2 – High compliance

Clause 4.1.3 – Full compliance

Clause 4.1.1 requires that Hunter Water have in place an Asset Management System that is aligned with the requirements of either BSI PAS55:2008, the Water Services Association of Australia's Aquamark benchmarking tool or another system agreed with IPART. For the audit year 2016-17, Hunter Water had in place, and maintained, an asset management system that is consistent with the Water Services Association of Australia's Aquamark benchmarking tool. Hunter Water was actively transitioning to a system in accordance with the international standard *ISO55001 Asset Management – Management systems – Requirements* during 2016-2017 to meet its Operating Licence requirement.

Clause 4.1.2 requires that Hunter Water fully implements the Asset Management System described at 4.1.1 and that all relevant activities are carried out in accordance with the system. The evidence we reviewed found that Hunter Water is implementing the Asset Management System described at clause 4.1.1. A minor shortcoming is that Hunter Water's approach to asset criticality and risk assessment is not fully implemented or consistent across all asset classes.

Clause 4.1.3 requires that Hunter Water notify IPART of any significant changes to its Asset Management System. Hunter Water is required to change its Asset Management System under its new Operating Licence (2017-2022) which requires Hunter Water to develop a System compliant with the international standard *ISO55001 Asset Management – Management systems – Requirements* by 31 December 2017. Hunter Water has provided notification of the proposed changes to its Asset Management System through the Compliance and Performance Report.

3.2 Recommendations

Recommendation 4.1.2-1: By 30 June 2019 Hunter Water should fully implement an asset criticality and risk assessment approach that is consistent across all asset classes and consistent with the enterprise risk management framework.

Recommendation 4.1.2-2: We recommend that Hunter Water reviews the currency of all planned maintenance work instructions (for all assets) and prepares a program to update these as required over a period in accordance with its document control standard.

3.3 Opportunities for improvement

There are no opportunities for improvement for this clause.

4 Clause 6 Environment

4.1 Summary of findings

4.1.1 Clause 6.1 Environmental management

Clause 6.1.1 – Full compliance

Clause 6.1.2 – Full compliance

Clause 6.1.3 – High compliance

Clause 6.1.1

Clause 6.1.1 requires Hunter Water, by 30 June 2017, to develop a Management System which is consistent with the Australian Standard *AS/NZS ISO 14001:2004: Environmental Management Systems - Requirements with guidance for use* (Environmental Management System). Additional guidance provided by IPART was that the system had been certified on 22 October 2014 and for the auditors to check certification and the external audit report.

Detailed evidence with respect to this clause is presented in Table B-17.

Hunter Water's environmental management system achieved certification to *ISO 14001:2004* in 2014 and therefore, is compliant with clause 6.1.1 as it developed an environmental management system before the due date of 30 June 2017. The re-certification audit report confirms compliance with the 2004 standard for the audit date scope.

Although outside of the audit date scope,[5] Hunter Water should be commended for recently achieving certification to *ISO 14001:2015*.

Clause 6.1.2

Clause 6.1.2 requires Hunter Water to ensure that by 30 June 2017, the Environmental Management System is certified by an appropriately qualified third party to be consistent with the Australian Standard *AS/NZS ISO 14001:2004: Environmental Management Systems - Requirements with guidance for use* and that once the Environmental Management System is certified, that the certification is maintained during the remaining term of this Licence. Additional guidance provided by IPART was that the system had been certified on 22 October 2014 and for the auditors to check that certification has been maintained and the external audit report.

Detailed evidence with respect to this clause is presented in Table B-18.

Hunter Water supplied evidence to confirm that its Environmental Management System was certified by a reputable third party certifier, to meet the requirements of *AS/NZS 14001:2004*. Hunter Water also provided evidence to show that ongoing certification and surveillance audits had been undertaken since certification with two of the audits having occurred in the audit date scope. There were several audit findings of noteworthy effort, with the most significant shortcoming of the audit findings being minor.[6] The commitment to ongoing audits and the standard of the findings shows that the system has been maintained since certification.

Clause 6.1.3

Clause 6.1.3 requires Hunter Water, by 30 June 2017, to ensure that the Environment Management System is fully implemented and that all relevant activities are carried out in accordance with the system. Additional guidance provided by IPART was that the system had been certified on 22 October 2014 and for the auditors to check implementation.

Detailed evidence with respect to this clause is presented in Table B-20.

[5] 20 October 2017.

[6] Minor non-conformances are described as something that does not affect the capability of the management system to achieve the intended results.

Hunter Water supplied a wide range of evidence showing implementation across a number of areas of the Environmental Management System. It was also noted that a number of improvements were implemented in the audit period, including electronic environmental inspection reports and ongoing updating and review of documentation. A few minor shortcomings were noted in relation to training of operational and maintenance staff in environmental issues during maintenance and inspection activities, with two environmental issues not having been picked up in implementation of the annual reservoir inspection checklists for the Elermore Vale Reservoir site. The current schedule of environmental inspections of higher risk sites may mean that some lower risk areas are being missed with the flow-on potential to miss environmental impacts that may escalate. We have included recommendations relating to the training and revision of the environmental inspection schedule scope.

4.2 Recommendations

Recommendation 6.1.3-1: By 30 September 2018, refresher training of operations and maintenance staff should be conducted for annual inspections and maintenance activities. In particular, there should be a focus on identifying environmental impacts and ensuring mitigation of any impacts noted.

Recommendation 6.1.3-2: By 30 September 2018, the schedule of environmental inspections should be reviewed and expanded where relevant to include the following: if inspecting a high risk site (e.g. chlorinator or WTP) that is in close proximity to a lower risk site (e.g. reservoir or water pumping station) the lower risk site should also be included in the inspection.

4.3 Opportunities for improvement

OFI 6.1.3-1:Ensure that an appropriate team is assembled for the aspects and impacts risk review, including Veolia staff.

OFI 6.1.3-2: Improve record keeping of the people involved in the aspects and impacts risk register updates.

5 Clause 7 Quality

5.1 Summary of findings

Clause 7.1.1 – Full compliance

Clause 7.1.2 – Full compliance

Clause 7.1.3 – Full compliance

5.1.1 Clause 7.1 Quality management system

Clause 7.1.1

Clause 7.1.1 requires Hunter Water, by 30 June 2017, to develop a Management System that is consistent with the Australian Standard *AS/NZS ISO 9001:2008: Quality Management Systems – Requirements (Quality Management System)*. IPART's instructions to us were to check certification and the external audit report.

Detailed evidence with respect to this clause is presented in Table B-21.

Hunter Water's quality management system achieved certification to *ISO 9001:2008* in August 2015 and therefore, is compliant with clause 7.1.1 as it developed a quality management system before the due date of 30 June 2017. Hunter Water has recently achieved certification to *ISO 9001:2015*. We would like to commend Hunter Water on achieving this certification. We checked the external audit reports as part of assessing clauses 7.1.2 and 7.1.3. This clause achieves full compliance.

Clause 7.1.2

Clause 7.1.2 requires Hunter Water to, by 30 June 2017, have its Quality Management System certified by an appropriately qualified third party to be consistent with the Australian Standard *AS/NZS ISO 9001:2008: Quality Management Systems – Requirements*; and that once the Quality Management System is certified, that the certification is maintained during the remaining term of this Licence. IPART's instructions to the auditors were to check that certification has been maintained and the external audit report.

Detailed evidence with respect to this clause is presented in Table B-22.

Hunter Water supplied evidence to confirm that its Quality Management System was certified by a reputable third party certifier, to meet the requirements of *AS/NZS ISO 9001:2008*. Hunter Water also provided evidence to show that ongoing certification and surveillance audits had been undertaken since certification with two of the audits (IMS audits) having occurred in the audit date scope. Since certification, Hunter Water has transitioned to *ISO 9001:2015* with certification achieved in June 2017. This clause achieves full compliance.

Clause 7.1.3

Clause 7.1.3 requires Hunter Water to, by 30 June 2017, ensure that the Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the system. IPART's instructions to the auditors were to check implementation.

Detailed evidence with respect to this clause is presented in Table B-24.

Hunter Water has implemented an Integrated Management System which includes Quality Management. Hunter Water has achieved and maintained its certification to the *standard ISO 9001:2008* and achieved certification to *ISO 9001:2015*, all by 30 June 2017. We tested the requirements of several areas of the quality requirements within the IMS including via the drinking water and environmental components of this operating licence audit. Hunter Water has a robust system in place for managing quality aspects of its business and interviewees were able to corroborate system implementation, having a good understanding of the quality aspects and processes of the business. We commend Hunter Water on the succinct nature of its IMS Manual. The

Manual represents a clearly articulated picture of the way in which the IMS is constructed including how quality fits within that system.

The external auditors' reports and for the most part our audit confirmed that the system is implemented in practice. Within the audit date scope, there are two key documents which had not been reviewed according to their review frequency, these being the Corporate Document Control Standard and the Enterprise Risk Management Framework. We acknowledge that given that both documents were undergoing wider review (for instance the Enterprise Risk Management Framework is being turned into a Standard), there is a sound reason that they had not yet been finalised. There were also some gaps in terms of filling in non-conformance records. The Enterprise Risk Management Framework and the Corporate Document Control Standard are currently awaiting approval and implementation and good reason was provided to this end. As result, this clause has been awarded full compliance but as an observation, these documents should be finalised and implemented as a priority in the 2017-18 financial year due to their fundamental status to the Integrated Management System and good corporate functioning. From discussion with the IMS Manager, it is expected that Hunter Water will finalise the outstanding documents within the 2017-18 financial year.

5.2 Recommendations

There are no recommendations for this clause.

5.3 Opportunities for improvement

OFI 7.1.3-1: Ensure that the Manager Health, Safety and Environment's title is updated to also include 'Quality' e.g. 'SHEQ' or Safety, Health, Environment and Quality (to align with other organisations).

OFI 7.1.3-2: Add Quality Manager as a member to the Water Quality Committee (in the terms of reference).

OFI 7.1.3-3: Ensure that MidCoast Council is added as an interested party to the 'Interested Parties for QMS, EMS Register'.

OFI 7.1.3-4: Ensure that the Enterprise Risk Management Standard and Corporate Document Control Standard are finalised and implemented within the 2017-2018 financial year.

OFI 7.1.3-5: In training, reinforce the need to fill in all record fields in Integrum and other areas, such as software systems and other areas of documentation, as required.

6 Clause 8 Performance monitoring

6.1 Summary of findings

6.1.1 Clause 8.2 Reporting

Clause 8.2.2 – Full compliance

Clause 8.2.2 requires that Hunter Water maintains record systems that are sufficient to enable it to accurately report data in accordance with the Reporting Manual. Our audit found that Hunter Water's management systems and information systems are sufficiently robust for the purpose of accurate reporting in accordance with the reporting manual. The reporting data within the scope of the audit relating to the reporting manual was found to be reliable. While some minor issues have been noted in this audit report in relation to Hunter Water's management system documentation, these do not impact on the reported information.

6.2 Recommendations

There are no recommendations for this clause.

6.3 Opportunities for improvement

There are no opportunities for improvement for this clause.

7 Previous ministerial recommendations

Recommendation 2013-14-02,03,04,06,13: Water Quality Management System Conditions 2.1.1, 2.1.2, 2.2.1 & 2.2.2

Item	Detail
IPART's recommendation to the Minister	Within 6 months, Hunter Water should review Critical Control Points (CCPs) for each treatment plant, including: a) review all CCP critical limits (including alarm delays), and monitoring points to ensure they reflect current practice, as agreed with NSW Health b) develop a process to ensure critical limits are only altered with supervisory consent and there is a failsafe process to ensure that they are reinstated before water quality is compromised c) revise and review CCP documentation to clearly state location, parameters, target criteria, monitoring frequency, critical limits, corrective actions and responsibilities for each CCP d) develop a process to record and document corrective actions, and preventive measures to reduce risks e) operational and critical limits must be set in SCADA as alarms, including delay times where appropriate.
2015-16 audit findings, and status as reported by utility on 31 March 2017	**Drinking Water CCP**s: NSW Health noted that the CCPs are still to be finalised to its satisfaction and in its letter of 27 June 2016, noted that there are still compliance issues such as fluoride limits and confirmation of responses and response times to exceedances. In this audit's findings, there are also issues noted with the CCP limits, complexity of the HACCP tables and gaps in the flow diagrams that may mean hazards and risks could be missed. The update from Hunter Water stated that Hunter Water has submitted revised CCP documentation for drinking water quality to NSW Health incorporating their previous feedback. Submission of the revised documentation was discussed at the March 2017 liaison meeting between NSW Health and Hunter Water. Hunter Water is awaiting a response from NSW Health on the revised CCP documentation. Completion date will depend on feedback from NSW Health. **Recycled Water CCPs:** NSW Health confirmed that RWQMPs have been submitted by Hunter Water but are yet to be reviewed. A standard has been developed for establishing and reviewing recycled water CCPs. The procedure is consistent with the AGWR approach and clearly sets out responsibilities for decision-making. The validation testing program has been completed and appears to be sound and includes the correct parameters e.g. UV transmissivity for validating process unit 'fitness for purpose' and LRV credits. A Corporate RWQMP is in place and has been updated. The diagram of the Framework is incorrect – the supporting Requirements are those from the ADWG Framework – not the AGWR Framework. Flow diagrams include CCPs but do not have version control or include evidence of ground-truthing and sign-off. This process should have been conducted before the risk assessment and CCP process was conducted. The update from Hunter Water stated that CCPs have been reviewed, included in the Recycled Water Quality Management Plans and submitted to NSW Health. Hunter Water has received a letter indicating NSW Health's satisfaction. SCADA changes are currently being implemented. Due to be completed 30 June 2017.

Item	Detail
IPART guidance	Auditor to check for completeness.
Audit finding	We acknowledge the continual improvement in CCP management by Hunter Water. In practice these continual improvements contribute to the complexity in closing this recommendation. **Drinking water:** CCPs are not yet completed for the reasons provided above. This part of the recommendation remains open. Further commentary is provide in Table B-2 and Table B-4. **Recycled water**: CCPs have been reviewed, included in the Recycled Water Quality Management Plans and submitted to NSW Health. NSW Health supplied a letter on 10 March 2017, showing their satisfaction with the status of the review and update program for the RWQMP (rather than satisfaction with the RWQMPs themselves). Flow diagrams still do not have version control or include evidence of ground-truthing and sign-off. This aspect should be considered as part of the gap analysis in Recommendation 2015/16-05. Not all SCADA upgrades had been completed in the audit period.
Recommendation status	This recommendation remains open. To assist in the identification of any aspects still outstanding in the 2017-18 audit we make a further part to Recommendation 2013-14-02,03,04,06,13: f) For the 2017-18 audit Hunter Water should prepare a report (supported by detailed auditable evidence) that demonstrates the status of each part of the Recommendation 2013-14-02,03,04,06,13 for each system.

Recommendation 2013/14-14-12: Recycled Water Quality Management System Condition 2.2.2

Item	Detail
IPART's recommendation to the Minister	Within 12 months, Hunter Water should review the following matters in respect to the Clarence Town Wastewater Treatment Works: • The effectiveness of the CCPs. If the corrective action can be undertaken in a timely manner, and it reduces risk, then implement the CCPs as soon as possible. • The risk assessment at Clarence Town Wastewater Treatment Works to take account of irrigation-water ponding at the site.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Component 1 of the recommendation is still ongoing noting that Hunter Water has submitted its system-specific RWQMPs to NSW Health by end June 2016 and is awaiting comment. The Veolia risk assessment now includes ponding of irrigation water. The date of the document is 21 March 2016. Only residual risk is reported, the AGWR Framework requires both inherent (Element 2) and residual risk (Element 3) to be assessed. However given that the event has been included, component two of the recommendation is completed and can be closed. Hunter Water's progress report since the 2015-16 audit states that the CCP for Clarence Town WWTW has been updated and will be further validated at the risk assessment scheduled for May 2017. Due to be completed by 30 June 2017.
IPART guidance	Auditor to check completeness.
Audit finding	A risk assessment review was undertaken for Clarence Town Wastewater Treatment Works in May 2017. Sufficient drainage was noted as a control to remove excess water and avoid hydraulic overload and ponding.[7] Evidence was also provided for work undertaken by Veolia to improve draining on irrigation areas to prevent ponding issues, including a purchase order dated September 2016.[8] Consideration given to validation of the CCP is not specifically documented in the risk assessment spreadsheet. Evidence was provided in the Clarence Town WWTW RWQMP (dated October 2017) of the inclusion of a lagoon ponding CCP. While the evidence was out of scope, we note that the activities were undertaken in the audit period. Issues concerning currency and documentation of the basis of CCPs is included within Recommendation 2.1-2.
Recommendation status	It is proposed this recommendation be closed as the outstanding aspect associated with the CCP is included within Recommendation 2.1-2.

[7] Working Paper - Clarence Town Risk Workshop Worksheet 2017.XLSM; Risk ID no. CLA14 Adverse soil effects due to use of recycled water incorrectly

[8] Item 3b PO for Enviroculture Clarence Town WWTW Pooling.pdf; Item 3a Screenshot for Clarence Town Pooling PO GWA85683.docx

Recommendation 2013/14-20: 5.2.4 Asset Management System Condition 4.1.1

Item	Detail
IPART's recommendation to the Minister	Hunter Water should continue implementing the five improvement initiatives identified as part of its 2012 Benchmarking Program including: • develop a holistic approach to asset maintenance • the complete capture of all asset and related maintenance information in its Ellipse Asset/ Maintenance Management System. (It was noted that these initiatives should be fully implemented by July 2017, consistent with Hunter Water's *ISO 55001* implementation program).
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that Hunter Water is incorporating both initiatives into the creation of the Asset Management System which will be completed December 2017.
IPART guidance	Auditor to check progress.
Audit finding	We assessed Hunter Water's progress against this recommendation in parallel with our audit work for Clause 4.1.2. In our discussion for this clause, we set out that since 2012 and in part driven by the appointment of an external contractor for operation and maintenance of treatment plants, Hunter Water has implemented improvements to its maintenance approach including redrafting of planned maintenance procedures, review of critical spares, monitoring planned maintenance completion and improving the planning and scheduling of civil planned maintenance. We consider that this recommendation should be closed.
Recommendation status	This recommendation is closed.

Recommendation 2014/15-01: Recycled Water Quality Management System Condition 2.2.2

Item	Detail
IPART's recommendation to the Minister	It is recommended that Hunter Water commence the implementation of the interim CCPs as soon as possible and finalise validation program.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that updated CCP's have been included in RWQMP. The validation program has been finalised with the exception of helminth control. The helminth control validation work is currently underway. SCADA updates are currently underway. Due to be completed 30 June 2017.
IPART guidance	Auditor to check completeness.
Audit finding	A study was undertaken to determine if helminth control is adequate for the Hunter Water recycled water schemes supplying farming operations involving livestock. The report provides recommendation provided on controls that need to be put in place where lagoon treatment does not comply with the AGWR (Morperth, Karuah and Farley WWTWs).[9] The May 2017 Karuah WWTW risk assessment includes a recommendation to review helminth controls based on the recommendations of this report. Issues were noted regarding the validation of critical limits, and the poor log reductions for Cessnock and Kurri Kurri UV units.
Recommendation status	For clarity we propose this recommendation is replaced by: **Recommendation 2.2.2-1:** By 30 September 2018 ensure the preventive measures for helminth control for agricultural sites (Karuah, Morpeth and Farley) achieve the required LRVs as per the AGWR. **Recommendation 2.2.1-2:** By 30 September 2018, Hunter Water should: – Develop a table in each scheme RWQMP that documents the evidence for the selection of the CCP, its associated monitoring parameter(s) and limits. This should include sufficient document control to capture when changes are made and the basis of those changes. – Consult with NSW Health on the validation testing program for the water recycling schemes. – Specify the performance required of the UV units in their operating context and determine whether they are achieving this performance. Any failure in the performance of prevalidated UV units should be further investigated.

[9] Rec 01 - 2014-15 - Report - Helminth controls for Hunter Waters recycled water schemes.DOCX, dated May 2017

Recommendation 2014/15-02: Recycled Water Quality Management System Condition 2.2.2

Item	Detail
IPART's recommendation to the Minister	It is recommended that Hunter Water finalise its validation program and facilitate endorsement of the outcomes by NSW Health. CCPs should then be adjusted or refined in accordance with the outcomes.
2015-16 audit findings, and status as reported by utility on 31 March 2017	See comments for 2014/15-01. Hunter Water has received a letter from NSW Health showing satisfaction with the current state.
IPART guidance	Auditor to check completeness.
Audit finding	Hunter Water completed a study into the validation of helminth controls. An additional report is being commissioned to provide options to improve helminth controls at the Karuah reuse scheme. The selection of CCP monitoring parameters and the basis of CCP limits, particularly for the UV units, in relation to validation results is not well documented.
Recommendation status	For clarity we propose the above recommendation is incorporated into: **Recommendation 2.2.1-2:** By 30 September 2018, Hunter Water should: – Develop a table in each scheme RWQMP that documents the evidence for the selection of the CCP, its associated monitoring parameter(s) and limits. This should include sufficient document control to capture when changes are made and the basis of those changes. – Consult with NSW Health on the validation testing program for the water recycling schemes. – Specify the performance required of the UV units in their operating context and determine whether they are achieving this performance. Any failure in the performance of prevalidated UV units should be further investigated.

Recommendation 2014/15-03: 5.2.4 Asset Management System Condition 4.1.1

Item	Detail
IPART's recommendation to the Minister	It is recommended that Hunter Water continues to fully implement improvement initiatives in respect of: – the development and implementation of a holistic approach to maintenance management – the complete capture of all asset and related maintenance information in its Enterprise Resource Planning (Asset/ Maintenance Management) System – criticality and condition assessment – review and update of operational and maintenance procedures across the whole of the asset portfolio.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that Hunter Water is incorporating the required initiatives into the creation of the Asset Management System which will be completed December 2017.
IPART guidance	Auditor to check progress.
Audit finding	Two parts of this recommendation – relating to a holistic approach to asset management and capture of asset related information are captured by recommendation 2013/14-20:5.2.4 which is now considered to be closed. Further, we tested at this audit the currency of maintenance procedures and found that Hunter Water has in place a program to continually improve these procedures. This is evidenced by more than 300 improvement opportunities for treatment plant planned maintenance procedures being identified in 2016/17 of which 89% were implemented. However, we found in reviewing planned maintenance work instructions that a number were out of date (refer discussion at Clause 4.1.2. We therefore recommend that the part of this recommendation be retained but replaced be a new separate recommendation (Recommendation 4.1.2-2). We reviewed Hunter Water's approach to criticality and condition assessment in our discussion in this report for clause 4.1.2. Here we conclude that Hunter Water is still to implement a consistent approach to asset criticality and risk assessment across its asset classes and we therefore do not consider this part of the recommendation is closed. As this is one part of a larger recommendation with multiple parts, we suggest that this recommendation be replaced by a new recommendation (Recommendation 4.1.2-1) which we set out in the discussion for Clause 4.1.2.
Recommendation status	This recommendation is closed and replaced by Recommendation 4.1.2-1. **Recommendation 4.1.2-1:** By 30 June 2019 Hunter Water should fully implement an asset criticality and risk assessment approach that is consistent across all asset classes and consistent with the enterprise risk management framework.

Recommendation 2015/16-01: Water Quality – Drinking Water Quality Management System Clauses 2.1.1, 2.1.2

Item	Detail
IPART's recommendation to the Minister	By 30 June 2017, review all system process flow diagrams including all process steps, inputs, monitoring points, key characteristics, handover points between parties and raw water customers, to ensure that: – each flow diagram matches the SCADA diagram, – each flow diagram and SCADA diagram is signed off by someone with appropriate authority, and – each flow diagram has associated version history and review cycle information.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that draft flow diagrams have been prepared for all systems. Draft diagrams will be reviewed by the Water Quality Committee and are on track to be finalised by the due date.
IPART guidance	Auditor to check for completeness.
Audit finding	Hunter Water stated that it has developed a suite of conceptual flow diagrams including high level catchment to tap diagrams of each water supply system and process flow diagrams for each WTP. In addition, improvements were also made to other diagrams and schematics (Tomago Borefields and Distribution Network). We checked the evidence provided[10] and confirm that the flow diagrams meet the requirements of this recommendation and Framework Element 2. Further detailed commentary is included in Table B-1 and Table B-3. Regarding 'sign-off', Hunter Water notes that development and review of the diagrams was facilitated via the Water Quality Committee with diagram verification obtained by relevant managers from Hunter Water (Manager Water Network Operations and Team Leader Water Resource Planning) and Veolia (Manager treatment operations) and that sign-off is within each document. We checked that each flow diagram had been signed off as well as the minutes of the Water Quality Committee[11] for review and discussion of the flow diagrams.
Recommendation status	This recommendation is closed.

[10] HW2015-705 1.001 Anna Bay WTP.pdf; HW2015-705 1.002 Dungog WTP.pdf; HW2015-705 1.003 Grahamstown WTP.pdf; HW2015-705 1.004 Gresford WTP.pdf; HW2015-705 1.005 Lemon Tree Passage WTP.pdf; HW2015-705 1.006 Nelson Bay WTP.pdf; HW2015-1365 16.001 Anna Nelson Bay Water Supply System .pdf; HW2015-1365 16.002 Lemon Tree Water Supply System.pdf; HW2015-1365 16.003 Gresford Water Supply System.pdf; HW2015-1365 16.004 Grahamstown Water Supply System.pdf; HW2015-1365 16.005 Dungog Water Supply System.pdf; HW2015-1365 16.006 Tomago Borefields .pdf; S09-13 16 1.005 Distribution Network.PDF.

[11] HW2006-1417 28 5.012 Minutes - April 2017 Water Quality Committee Meeting.pdf.

Recommendation 2015/16-02: Water Quality – Drinking Water Quality Management System Clauses 2.1.1, 2.1.2

Item	Detail
IPART's recommendation to the Minister	By 30 June 2017, use the revised flow diagram to revise the risk assessment for Lemon Tree Passage Water Treatment Plant.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that the Lemon Tree Passage Water Treatment Plant risk assessment has been reviewed based on the draft flow diagram. A final review will be undertaken once the diagrams are finalised and is on track to be completed by the due date.
IPART guidance	Auditor to check completeness.
Audit finding	Hunter Water noted that the Lemon Tree Passage (LTP) Risk Assessment was reviewed within the reporting period based on the updated process flow diagram. They also stated that the updated LTP WTP risk report[12] provided as evidence outlines the details of the changes including what was reviewed and risks that were retired in response to the updated process flow diagram. The Water Quality Committee meeting minutes (April 2017) state that the LTP risk assessment review was completed using the revised flow diagram and also state that a draft of the flow diagrams was ready to be reviewed. We therefore queried whether the risk assessment review had been completed using the updated flow diagram when the flow diagrams were still in draft form and had yet to be signed off as accurate in April 2017. Hunter Water noted that an initial version of the LTP WTP flow diagram was prepared in January 2017 as part of the risk assessment review process. The diagram was then updated in February 2017 to include administrative details and other minor updates. This diagram was the one used to review and update the risk assessment even though it had not yet been approved by the Water Quality Committee. The explanation provided by Hunter Water was that after review of the flow diagram by relevant personnel, it was concluded that the diagram would not change the risk assessment. Further, the updated LTP flow diagram was communicated to the Water Quality Committee[13] with no further changes required. We checked the updated report against the original report.[14] We confirmed that the risks had been reviewed. We also confirmed the retired risks based on a site verification of the flow diagram by the treatment contractor. We confirmed the revisions to the risk assessment and that the proposed changes were communicated to the Water Quality Committee at its April 2017 Meeting.[15] We accept the statement from Hunter Water clarifying its response to this recommendation and the timing.
Recommendation status	This recommendation is closed.

[12] HW2015-1365 8 3.003 Report - Lemon Tree Passage WTP Risk Assessment Summary Report.DOCX
[13] HW2006-1417 28 5.012 Minutes - April 2017 Water Quality Committee Meeting.pdf.
[14] HW2015-705 1.005 Lemon Tree Passage WTP.pdf.
[15] HW2006-1417 28 5.012 Minutes - April 2017 Water Quality Committee Meeting.pdf.

Recommendation 2015/16-03: Water Quality – Drinking Water Quality Management System Clauses 2.1.1, 2.1.2

Item	Detail
IPART's recommendation to the Minister	By 30 June 2017, review and revise documentation associated with the emergency management process including: • Veolia's Crisis Management Plan, • cross-referencing in the Hunter Water Emergency Management Plan, and • the currency across all document history fields in Veolia's Incident Recording and Reporting procedure.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that cross referencing in the Hunter Water Emergency Management Plan has been reviewed and updated as part of the annual review process. Veolia's emergency management documentation is on track to be updated by the due date.
IPART guidance	Auditor to check completeness.
Audit finding	Hunter Water stated that the Hunter Water and Veolia emergency management documentation have both been updated to meet the requirements of the recommendation. Additionally, a new task to review contact details within the Hunter Water EMP has been added to the Corporate Business Resilience Calendar. We confirmed that the emergency management documents provided as evidence had been updated.[16] We confirmed the additional task to "*Check that emergency contact numbers are current*" has been added to the calendar.[17]
Recommendation status	This recommendation is closed.

[16] HW2015-1449 1 9.015 PL-ANZ-9-382-3 Crisis Management Plan.PDF (April 2017 - 20.04.2017); HW2015-1449 1 9.016 PR-ANZ-9-456-4 Incident Reporting and Recording.PDF (30.05.2017); HW2015-1449 1 9.017 PR-ANZ-9-7314-5 Incident Investigation.PDF (08.07.2016); HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf (Version 6 September 2016).

[17] HW2014-1242 4 2.004 Business Resilience Calendar.xlsx (Item# Sep-05).

Recommendation 2015/16-04: Water Quality – Recycled Water Quality Management System Clauses 2.1.1, 2.1.2

Item	Detail
IPART's recommendation to the Minister	By 30 June 2017, Hunter Water should review the implementation of recommendations from its Environmental Compliance Audit for the Karuah Effluent Reuse Enterprise, and develop appropriate deadlines for any recommendations that have not been addressed.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that the review of the implementation status of recommendation from the Environmental Compliance Audit for the Karuah Effluent Reuse Enterprise has been completed. Several actions from the audit were identified as being completed. Deadlines for addressing remaining outstanding audit actions will be determined by 30 June 2017.
IPART guidance	Auditor to check completeness.
Audit finding	Tracking of Karuah Environmental Compliance Audit outstanding actions has been undertaken using the environmental commitments tracking register.[18] The actions were noted as completed within the tracking register. Evidence was provided for some of the actions that have been completed including a farming contract that specifies requirements around environmental management[19], installation of a weather station[20] and updates to the Karuah RWQMP (dated October 2017).[21] While some of the evidence was out of scope, we note that the activities were undertaken in the audit period.
Recommendation status	This recommendation is closed.

[18] Rec 04 - 2015-16 - Register - ER0106 - Environmental Commitments Tracking – CURRENT.XLSM
[19] Rec 04 - 2015-16 - Karuah and Clarence Town farm management contract tender.docx
[20] Item 4a Karuah Rain Gauge Data.docx
[21] Rec 04 - 2015-16 - Karuah WWTW Recycled Water Quality Management Plan.DOCX

Recommendation 2015/16-05: Water Quality – Recycled Water Quality Management System Clauses 2.1.1, 2.1.2

Item	Detail
IPART's recommendation to the Minister	By 30 June 2018, Hunter Water should ensure that a gap analysis is completed of all RWQMPs, against the Framework for Management of Recycled Water Quality and Use. Particular focus should be given to the gaps in compliance areas detailed in the 2015-16 audit report
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that Hunter Water has commenced the gap analysis of the RWQMPs and has completed a number of actions including improvement to risk assessment processes and flow diagram validation. The gap analysis is on track to be completed before 30 June 2018.
IPART guidance	Auditor to check progress.
Audit finding	Limited progress has been made to close this recommendation. A spreadsheet was provided as evidence that notes high level compliance gaps from the 2015-16 audit report, but a review has not yet been undertaken against the Framework elements, components and actions.
Recommendation status	We recommend updating the recommendation to: By 30 September 2018, Hunter Water should ensure that a gap analysis is completed of all RWQMPs, against the Framework for Management of Recycled Water Quality and Use. Particular focus should be given to the gaps in compliance areas detailed in the 2015-16 and 2016-17 (this) audit report.

Recommendation 2015/16-06: Water Quality – Asset Management System Clause 4.1.2

Item	Detail
IPART's recommendation to the Minister	By 31 December 2017, review the Asset Standards Management Plan and the Asset Class Management Plans, which were overdue for review. Ensure all Asset Class Management Plans meet Hunter Water's document control system.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that both these actions are proceeding and on track to be completed by 31 December 2017. Hunter Water has reviewed the Asset Standards Management Plan and is currently finalising the revised plan for approval. Hunter Water is creating Asset Class Management Plan standards and procedures, with the specific plans to be update to meet the standards and Hunter Water's document control system by December 2017, where required.
IPART guidance	Auditor to check progress
Audit finding	At the audit interviews we discussed progress with Hunter Water and its approach to asset management plans within the context of the move to *ISO 55001*. We were provided with and reviewed the Asset Class Management Plan for reservoirs which was revised in March 2016. We requested Hunter Water to provide a schedule detailing the status of revisions of the Asset Class Management Plans. This schedule shows that 17 of 52 plans are to be updated.
Recommendation status	This recommendation remains open.

Recommendation 2015/16-07: Water Quality – Performance Monitoring Clause 8.2.2

Item	Detail
IPART's recommendation to the Minister	By 30 June 2017, Hunter Water should ensure all compliance related documents are consistent with Hunter Water's procedure for managing document control.
2015-16 audit findings, and status as reported by utility on 31 March 2017	Hunter Water's progress report since the 2015-16 audit states that the standard and procedure for managing document control are being updated to provide a more robust process. Documents will be finalised and awareness to employees conducted by 30 June 2017. Hunter Water is also pursuing opportunities to replace its current Document Control technology with a more fit for purpose solution.
IPART guidance	Auditor to check completeness.
Audit finding	Hunter Water's March response states that its standard and procedure for document control were being updated. The Corporate Document Control Standard provided during the audit interviews (Rec 07 - 2015-16 - Standard - Corporate Document Control.docx) was authorised in September 2014 and due for review in September 2016 (but not reviewed at that time). This document defines the requirements for control of documents including approvals, review periods and roles and responsibilities. While the Corporate Document Control Standard is not compliant with itself we note at Clause 7 that there is reasonable justification for this. Hunter Water provided a schedule demonstrating how compliance related documents are consistent with the Standard: Rec 07 - 2015-16 - Schedule of controlled document audit evidence.docx. We are satisfied that Hunter Water has met the requirement of this recommendation.
Recommendation status	This recommendation is closed.

Appendix A Site Visit Report

Field verification audits were undertaken on Tuesday, 7 November 2017.

A.1 Kurri Kurri WWTW

This site was visited by the Primary Auditor for Environment and the Primary Auditor for Recycled Water.

Some chemicals are stored on site (ferrous chloride, aluminium sulphate, sodium hydroxide). We noted that signage was in place on the storage tanks and pipework. The bund area was in good condition with repairs having been recently undertaken. We were informed that the storage area is in the process of being upgraded to provide for better bunding and storage conditions. Bunding was also checked and was in place around the WAS pumps (STLOXWASPU02 and 3). We clarified that all site drainage is collected and transferred to the dirty backwash tank. No drainage intentionally leaves the site.

Veolia is required to have and maintain *ISO 14001* certification as part of its contractual obligations. *ISO 14001* certificate was sighted. Veolia was recertified in 2017. Manager Systems Reporting Risk & Compliance (Veolia) confirmed that certificates are provided to Hunter Water.

We tested operator understanding of implementation of the audit process. Manager Reporting Risk and Compliance noted that the SHEQ team undertakes field audits at least once per plant per year, Hunter Water conducted two audits for recycled water as well as one for biosolids management.

The recycled water policy (dated June 2017) was on display in the meal room. The site diary was in use and hand written records kept. Toolbox meeting was noted as having occurred 5/1/2017.

EPL alarms were witnessed on SCADA. We noted the EPL monitoring points during the plant walkthrough.

We witnessed the biosolid truck bay noting drainage and bunding. The site receives and fills two biosolids trucks per week. The area was noted as being clean and tidy during the site visit.

Operators confirmed that email notifications are sent on a CCP breach along with what the operator has done to manage the issue.

The following documents were sighted:

- Recycled Water Policy (current)
- Hunter Water Incident Notification Protocol (HW-9-7102-2)
- Environmental Protection Licence EPL 1767
- Veolia Quality Policy 16/9/2015
- Veolia Environment Policy 16/9/15

A.2 Gresford WPS (extraction point)

The extraction point for the Gresford Water Treatment Plant was visited by the Primary Auditor and supporting Primary Auditor for Drinking Water Quality (also the supporting Asset Management Auditor). We noted the catchment sign in place[22] including the telephone number for reporting of pollution threats. We spoke with the Field Supervisor - Mechanical who explained the operation and maintenance aspects of the pumps. We noted some erosion of the pathway leading down to the extraction point which may present a minor environmental issue in terms of sediment generation. We inspected the pump site and noted that for the most part, apart from one small area of corrosion, it was well maintained. The cabinets for the two pump stations were well maintained, clean and signed. We discussed the issues of silting of the extraction point. Air scour is used to clean

[22] "*You are now in the Paterson Drinking Water Catchment*"

the point of entry and was added after the site had been built to manage issues associated with clogging of the intake. Air scours are conducted on a 4 weekly preventive maintenance schedule although are undertaken more frequently in lower flows. We sighted the air scour cabinet and confirmed the air scour hook-up point. The intake point has an infiltration zone with 5 mm gravel. Only one pump is in operation at any one time. The Paterson or Allyn River source is used to supply the Gresford WTP. There is no formal procedure for changing over the source. The Hunter Water operators inform the treatment contractor of changeover.

A.3 Gresford WTP

The Gresford Water Treatment Plant was visited by the Primary Auditor and supporting Lead Auditor for Drinking Water Quality (also the supporting Asset Management auditor). We undertook the site visit for the plant after visiting the extraction point. We walked through the plant reviewing the flow diagram. The diagram matched what we sighted in practice. We noted above that there is no formal procedure in place for source changeover (Paterson vs Allyn River). We discussed this issue with the Lead Operator for the Gresford WTP who confirmed that the Hunter Water System Controller lets Veolia know of the change of source. He noted that records are kept in the plant diary. We reviewed the plant diary requesting information relating to the last time a changeover had been undertaken or attempted. We confirmed that notes had been made in relation to this issue for 18/4/17. We were able to cross-match this information with an incident report on the matter.[23]

The Lead Operator confirmed that contractually, the handover point for water quality responsibility, in and out, is at the boundary of the site (fence).

We checked the clear water tank at the plant. The tank was in good condition and we confirmed this by getting up onto the top of the tank and checked that the hatch was locked and there were no holes in the roof or signs of vermin entry. We note that the ends of the corrugation of the roof are not capped however, the holes are small and would not allow bird entry. Integrity measures were in place. The ladder was locked and stowed. There were no signs of bird faeces or feathers indicating roosting (and therefore, potential for contamination of the treated water). There were no signs of leaking. The clear water tank is inspected once per month. Vermin proofing and the roof are checked and an inspection sheet filled in. Reports on reservoirs are prepared and presented to NSW Health at the quarterly meetings. We requested and were provided with the reservoir inspection schedule[24] and confirmed that inspections for the Gresford clear water tank generally met the 1 month frequency during the audit date scope.

CCP table was in place but was outside of the audit date scope – having been updated to reflect recent changes in pH limits. We requested, and received, the previous CCP table and confirmed the change.[25]

A.4 North Lambton depot

The North Lambton Depot was visited by the Primary Auditor Asset Management and the supporting Auditor Environmental Management (who is also the supporting Drinking Water Quality Auditor). At the North Lambton reservoir depot we met with the planned civil maintenance scheduling team. The team's focus is on driving down the number of outstanding low priority planned maintenance jobs (e.g. small leaks). We discussed the team's approach to planning and scheduling tasks and reviewed the schedules for the week of the visit and a week during the audit period. We also reviewed a number of workpacks that are put together by this team for the civil works crews. The team showed strong awareness of maximising utilisation of resources, the need to address outstanding issues and the performance expected of their functional area.

[23] Item 6a Incident 0240-W-GRE.pdf (15/4/17).
[24] Item 11 CWT Reservoir Inspection Report Register.pdf
[25] HW2014-778 15 2.007 Register - Gresford WTP HACCP Limit Table 29012017.pdf.

We checked the spoil area on site and noted that spoil is kept in separate signed areas. The Manager Environment and Sustainability advised that processes were currently being put in place to improve the management of the spoil area. Good practices were noted for storage of pipes on shelves above the ground in well sign-posted areas. The site was noted to be clean and tidy.

A.5 Planned maintenance job

The Primary Auditor Asset and support Auditor Environment Management visited a planned civil maintenance job which involved the repair of a leaking hydrant at 108 Lookout Road, New Lambton Heights (AOMS Job NO: 470304). This leak was first reported in September 2015. It had been assigned a low priority (Priority 6) because the leak was small. An attempt to repair the leak in September 2015 was unsuccessful because the network was unable to be shutdown due to a failed valve. This job was then set aside as difficult until the planned maintenance scheduling team picked it up as part of its drive to reduce the number of outstanding planned works.

The works were scheduled for the day of our site visit. At the time of our site visit, the hydrant had been exposed and the crew were attempting to shut down the main. The shutdown was planned to not use the valve that had not been able to operate back in 2015. We were informed the next day that a shutdown had not been able to be achieved because another valve had not been able to be closed. We were informed that the leak was stopped by the crew hitting the hydrant with a hammer. We saw that the work order had been closed with the description of “washer replaced”. This does not accord with the description of the work that was undertaken that was provided.

While Hunter Water has sought to be proactive in addressing its outstanding low priority jobs, this example has led to the identification of further network issues, i.e. two valves that were not able to be operated and will in turn require maintenance. We saw that Hunter Water had created work orders for these activities. A further issue is that the hydrant which was leaking appears to be in need of replacement because of both the observed leak and its apparent condition. The hydrant is 37 years old which is over Hunter Water’s design life for hydrants of 30 years. While age alone should generally not be a reason for replacing assets, it lends weight to the other observations that Hunter Water should be seeking to replace this hydrant. This is reinforced further by the costs of shutting down the network.

We also sighted the ‘On Site 3 in 1 (Site inspection/Risk Assessment/Site induction)’ form. Environmental control measures were included in the form for use of sediment bags, which were sighted to be in place.

A.6 Wallsend WPS

The Primary Auditor Asset and support Auditor Environment Management visited Wallsend WPS. During this visit we discussed with Hunter Water the criticality of the site to service delivery and the criticality of assets at the site. The site has three incoming power supplies and multiple pump sets which provides considerable redundancy to mitigate the risk of failure of the assets. We discuss these themes further in relation to Clause 4.1.2.

This site was neat and tidy with the assets in a good condition.

A.7 Elermore Vale reservoirs

The Primary Auditor Assets and the supporting Auditor for Environmental Management (also the supporting Drinking Water Quality Auditor) visited Elermore Vale reservoir where we inspected the two steel reservoirs and the chlorine dosing facility.

The reservoirs were in reasonable condition although we could not access or observe the roof. We queried Hunter Water as to how it had assurance over the condition of the roof. Hunter Water replied that it undertook routine inspections of the reservoir site and provided an inspection form from April 2017. This has a section to confirm that the roof has been inspected which had been

ticked. We question the benefit of this approach given that very little of the reservoir roofs can be seen from ground level. We requested environmental inspection and annual reservoir inspection reports for the site. The reservoir inspection form provided post site visit was lacking in detail and also did not pick up issues of litter or the overgrown vegetation in the stormwater pits. This is further discussed in Clause 6.1.

In addition to the visual inspection, Hunter Water had completed detailed condition assessments (report dated November 2017) of the roofs of both reservoirs in July and August 2017. We were provided with and reviewed the condition assessment reports for each reservoir. The assessments found that Reservoir 1 has holes in the roof and that the bird mesh has failed making the reservoir no longer vermin proof. This confirms the ineffectiveness of the ground level inspection.

The reservoirs are located within a bush area away from residential housing. We noted that a buffer area existed around the reservoir and chlorinator building, but that vegetation was encroaching in some areas. We requested a copy of the bushfire management plan of the site, which was provided post site visit (dated May 2014) that showed areas had been recommended for clearance.

The two reservoirs had extensive graffiti and we sighted numerous paint cans and other litter around the site that had been brought by third parties. Condition of the paint cans (a number were rusted) and the number present indicated they had been present for an extended period. We noted stormwater pits had overgrown vegetation in them and were filled with water.

We also undertook a site visit of the Elermore Chlorinator which is located at the same location. The chlorinator is an unattended site and the building was fenced. HACCP are not displayed on site, as control of these CCPs is managed by the control room. The chlorinator site was clean and tidy.

Appendix B Detailed Findings

Clause 2.1 – Drinking Water - Water Quality

Clause 2.1.1

Table B-1. Clause 2.1.1 compliance grade

Subclause	Requirement	Compliance grade
2.1.1	Hunter Water must maintain a Management System that is consistent with: a) the Australian Drinking Water Guidelines; or b) if NSW Health specifies any amendment or addition to the Australian Drinking Water Guidelines that applies to Hunter Water, the Australian Drinking Water Guidelines as amended or added to by NSW Health, (Drinking Water Quality Management System). [Note: It is generally expected that Hunter Water will develop a system consistent with the Australian Drinking Water Guidelines, including the Drinking Water Quality Framework. However, where NSW Health considers it appropriate, the application of those Guidelines may be amended or added to, to take account of Hunter Water's circumstances and/or Drinking Water Quality policy and practices within New South Wales.]	Adequate

Risk	Target for full compliance
Waterborne outbreaks from mis-management of drinking water quality still occur in the developed world and therefore, the risk posed to public health from non-compliance with this clause could be significant.	Systems and processes in place to identify the requirements of the Australian Drinking Water Guidelines (assumed to also include the *Framework for Management of Drinking Water Quality*), in Hunter Water's context, a system, document or other which meets the intent of a Drinking Water Quality Management System and evidence to show how these requirements have been maintained.

Evidence sighted[26]

- Interviews with Hunter Water and Veolia water quality teams.
- Site visits to Gresford WTP, Paterson River raw water offtake, Elermore Vale Reservoir and Wallsend Pumping Station.
- 2.1 EL1 A1.1.1 HW2006-2968 41 44.001 Policy - Drinking Water Policy - PDF - CURRENT.pdf
- 2.1 EL1 A1.1.2 HW2015-1449 1 9.011 Article - eLearning Portal.PNG
- 2.1 EL1 A1.2.1 HW2012-441 23 1.029 Procedure - Managing Legal and Other Requirements – CURRENT.DOCX
- 2.1 EL1 A1.2.1 HW2012-778 60.001 Data - Compliance Calendar - June 2017.xlsx
- 2.1 EL1 A1.2.1 HW2013-421 9.006 Register - Legal and Other Requirements - Quality – CURRENT.pdf
- 2.1 EL1 A1.2.1 HW2013-421 9.007 Register - Summary of Corporate Reporting Requirements.pdf

[26] We note that there is duplication in the way the evidence was compiled by Hunter Water however, we have kept the evidence in the format it was provided as it gives a good indication of how the same piece of evidence often has standing across multiple elements of the Framework and shows the diligence and effort which Hunter Water applied to evidence collation.

- 2.1 EL1 A1.2.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL1 A1.2.2 HW2015-1449 1 9.012 DWQ Compliance Training.PDF
- 2.1 EL1 A1.2.2 HW2015-1449 1 9.013 DWQ Compliance Training Example Attendance Sheet.PDF
- 2.1 EL1 A1.2.2 HW2015-1449 1 9.020 DWQ Awareness Training Completion Report.PDF
- 2.1 EL1 A1.2.2 HW2015-1449 1 9.040 Drinking Water Quality Awareness Training Material.pptx
- 2.1 EL1 A1.2.2 HW2015-755 21.019 Position Description - Manager Water Network Operations.pdf
- 2.1 EL1 A1.2.2 HW2015-755 21.021 Position Description - Manager Treatment Operations.pdf
- 2.1 EL1 A1.2.3 HW2012-441 23 1.029 Procedure - Managing Legal and Other Requirements – CURRENT.DOCX
- 2.1 EL1 A1.2.3 HW2012-778 60.001 Data - Compliance Calendar - June 2017.xlsx
- 2.1 EL1 A1.2.3 HW2013-421 9.006 Register - Legal and Other Requirements - Quality – CURRENT.pdf
- 2.1 EL1 A1.2.3 HW2013-421 9.007 Register - Summary of Corporate Reporting Requirements.pdf
- 2.1 EL1 A1.3.1 HW2006-2906 4 6.010 Register - Contact Details NSW Health current September 2015.pdf
- 2.1 EL1 A1.3.1 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf
- 2.1 EL1 A1.3.1 HW2011-662 14 5.002 Emergency Response Communications Plan.pdf
- 2.1 EL1 A1.3.1 HW2014-1242 4 2.004 Business Resilience Calendar.xlsx
- 2.1 EL1 A1.3.1 HW2015-1449 1 5.013 Data - Veolia Staff Contact Details Aug 2016.pdf
- 2.1 EL1 A1.3.1 HW2015-1449 1 5.015 File note - Lab Staff Contact Details Aug 2016.pdf
- 2.1 EL1 A1.3.2 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.pdf
- 2.1 EL1 A1.3.2 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.pdf
- 2.1 EL1 A1.3.2 HW2009-1367 25.011 MOU - UON Science and IT and HWC.PDF
- 2.1 EL1 A1.3.2 HW2012-369 3 5.005 Signed CMA Hunter Water MoU.PDF
- 2.1 EL1 A1.3.2 HW2013-1244 1.012 HWC and LLS agreement - Dairy Project.PDF
- 2.1 EL1 A1.3.2 HW2015-1449 1 5.050 Minutes - Community Consultative Forum Minutes Sep16.PDF
- 2.1 EL1 A1.3.2 HW2015-1449 1 9.003 Report - Coastal Valleys CSC - Business Papers - 23 May 2017.PDF
- 2.1 EL1 A1.3.2 HW2015-1449 1 9.019 Email - Algae Notification Example.MSG
- 2.1 EL1 A1.3.3 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf
- 2.1 EL1 A1.3.3 HW2014-1242 4 2.004 Business Resilience Calendar.xlsx
- 2.1 EL2 A2.1.1 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.DOC
- 2.1 EL2 A2.1.1 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.DOCX
- 2.1 EL2 A2.1.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL2 A2.1.2 HW2015-1365 16.003 Gresford Water Supply System.pdf
- 2.1 EL2 A2.1.2 HW2015-1365 16.005 Dungog Water Supply System.pdf
- 2.1 EL2 A2.1.2 HW2015-705 1.002 Dungog WTP.pdf
- 2.1 EL2 A2.1.2 HW2015-705 1.004 Gresford WTP .pdf
- 2.1 EL2 A2.1.2 S09-13 16 1.005 Distribution Network.PDF
- 2.1 EL2 A2.1.3 HW2015-1365 1.001 Register - Gresford WTP.pdf
- 2.1 EL2 A2.1.3 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF

- 2.1 EL2 A2.1.3 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL2 A2.2.1 HW2006-1417 28 7.005 Email - Zone Mean Trends - Update for May 2017 - No Notable Issues Identified.MSG
- 2.1 EL2 A2.2.1 HW2006-1417 28 7.007 Report - Network Operations Report - June 2017.pdf
- 2.1 EL2 A2.2.1 HW2006-1417 2810.004 Monthly Catchment Report.PDF
- 2.1 EL2 A2.2.1 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF
- 2.1 EL2 A2.2.2 HW2006-1417 28 7.005 Email - Zone Mean Trends - Update for May 2017 - No Notable Issues Identified.MSG
- 2.1 EL2 A2.2.2 HW2006-1417 28 7.007 Report - Network Operations Report - June 2017.pdf
- 2.1 EL2 A2.2.2 HW2006-1417 2810.004 Monthly Catchment Report.PDF
- 2.1 EL2 A2.2.2 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF
- 2.1 EL2 A2.2.3 HW2006-1417 28 7.005 Email - Zone Mean Trends - Update for May 2017 - No Notable Issues Identified.MSG
- 2.1 EL2 A2.2.3 HW2006-1417 28 7.007 Report - Network Operations Report - June 2017.pdf
- 2.1 EL2 A2.2.3 HW2006-1417 28 8.006 On-line Water Quality Performance at Gresford WTP – June 2017.pdf
- 2.1 EL2 A2.2.3 HW2006-1417 2810.004 Monthly Catchment Report.PDF
- 2.1 EL2 A2.2.3 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF
- 2.1 EL2 A2.3.1 HW2008-704 17.004 Procedure - CURRENT - Enterprise Risk Management Framework.PDF
- 2.1 EL2 A2.3.1 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF
- 2.1 EL2 A2.3.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL2 A2.3.2 HW2015-1365 1.001 Register - Gresford WTP.pdf
- 2.1 EL2 A2.3.2 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL2 A2.3.3 HW2015-1365 1.001 Register - Gresford WTP.pdf
- 2.1 EL2 A2.3.3 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL2 A2.3.4 HW2015-1365 1.001 Register - Gresford WTP.pdf
- 2.1 EL2 A2.3.4 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL2 A2.3.5 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL2 A2.3.5 HW2015-1449 1 9.022 Gresford WTP Operating Manual.pdf
- 2.1 EL2 A2.3.6 HW2006-2906 8 33.014 Drinking Water Quality Risk Assessment Calendar.pdf
- 2.1 EL2 A2.3.6 HW2013-830 8 1.007 Data-Risk Driver Analysis Summary Table-Non-compliance agreed WQ standards (including CM).pdf
- 2.1 EL3 A3.1.1 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL3 A3.1.2 HW2015-1365 1.001 Register - Gresford WTP.pdf
- 2.1 EL3 A3.1.2 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL3 A3.1.2 HW2015-1449 1 9.007 Article - Drinking Water Quality Improvement Plan Actions.pdf
- 2.1 EL3 A3.2.1 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL3 A3.2.1 HW2015-1365 1.001 Register - Gresford WTP.pdf
- 2.1 EL3 A3.2.1 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF

- 2.1 EL3 A3.2.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL3 A3.2.2 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL3 A3.2.3 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL4 A4.1.1 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL4 A4.1.1 HW2015-1449 1 9.022 Gresford WTP Operating Manual.pdf
- 2.1 EL4 A4.1.2 HW2013-421 6.096 Work Instruction - 001 - Working on Potable Water Mains and Fittings.pdf
- 2.1 EL4 A4.1.2 HW2015-1449 1 5.024 Presentation - Screenshot Asset Operation Intranet Page.JPG
- 2.1 EL4 A4.1.2 HW2015-1449 1 5.025 Presentation - Screenshot DWQMS Intranet Page.JPG
- 2.1 EL4 A4.1.2 HW2015-1449 1 5.026 Presentation - Screenshot Lab Contract Intranet Page.JPG
- 2.1 EL4 A4.1.2 HW2015-1449 1 5.027 Presentation - Screenshot Treatment Operations Contract Intranet Page.JPG
- 2.1 EL4 A4.1.2 HW2015-1449 1 9.022 Gresford WTP Operating Manual.pdf
- 2.1 EL4 A4.2.1 HW2006-2906 2 6.006 Water Quality Monitoring Plan.pdf
- 2.1 EL4 A4.2.1 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL4 A4.2.1 HW2015-1449 1 9.022 Gresford WTP Operating Manual.pdf
- 2.1 EL4 A4.2.2 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL4 A4.2.2 HW2015-1449 1 5.047 Presentation - Screenshot Asset Operation - WQ Management and Exceptions Intranet Page.JPG
- 2.1 EL4 A4.2.2 HW2015-1449 1 9.022 Gresford WTP Operating Manual.pdf
- 2.1 EL4 A4.3.1 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC
- 2.1 EL4 A4.3.1 HW2010-1986 8.023 Procedure - Water Quality Exception Reporting - Current Version.DOCX
- 2.1 EL4 A4.3.1 HW2015-1449 1 5.047 Presentation - Screenshot Asset Operation - WQ Management and Exceptions Intranet Page.JPG
- 2.1 EL4 A4.3.2 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC
- 2.1 EL4 A4.3.2 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf
- 2.1 EL4 A4.3.2 HW2013-421 22.001 Standard – Incident Management – CURRENT.DOCX
- 2.1 EL4 A4.4.1 HW2014-1563 4 1.001 REF-HW-22-8910-1 Hunter Water Contract Maintenance Charter.pdf
- 2.1 EL4 A4.4.1 HW2014-1563 4 1.002 UG-ANZ-21-4585-1 GAMA Operator Guide.pdf
- 2.1 EL4 A4.4.1 HW2014-1579 2.003 Data - Gresford WTP.XLSB
- 2.1 EL4 A4.4.1 HW2015-1365 1.001 Register - Gresford WTP.pdf
- 2.1 EL4 A4.4.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL4 A4.4.1 HW2015-1449 1 5.029 Form - South Wallsend Chlorinator Maintenance Sheet Example.PDF
- 2.1 EL4 A4.4.1 HW2015-1449 1 5.030 Form - South Wallsend Chlorinator Maintenance Sheet Example.PDF
- 2.1 EL4 A4.4.1 HW2015-1449 1 9.007 Article - Drinking Water Quality Improvement Plan Actions.pdf
- 2.1 EL4 A4.4.1 HW2015-1449 1 9.027 Report - MN-HW-24-7872-3 WT Lab Methods Manual.PDF
- 2.1 EL4 A4.4.2 HW2014-1563 4 1.001 REF-HW-22-8910-1 Hunter Water Contract Maintenance Charter.pdf
- 2.1 EL4 A4.4.2 HW2014-1563 4 1.002 UG-ANZ-21-4585-1 GAMA Operator Guide.pdf

- 2.1 EL4 A4.5.1 HW2006-2247 34 11.001 Agreement - Contract for Supply and Delivery of Bulk Chemicals - CS0525 IXOM.PDF
- 2.1 EL4 A4.5.1 HW2015-1449 1 5.061 Presentation - Screenshot Approved Produces and Manufacturers Internet Page.JPG
- 2.1 EL4 A4.5.2 HW2012-1337 14 2.001 Procedure - Hypochlorite Tablet Validation.DOCX
- 2.1 EL4 A4.5.2 HW2015-1449 1 9.028 WI-HW-20-7842-1 Liquid Polymer - Ordering and Delivery.DOCX
- 2.1 EL4 A4.5.2 HW2015-1449 1 9.029 WI-HW-20-7841-1 Lime - Ordering, Delivery, Testing.DOCX
- 2.1 EL4 A6.2.3 HW2013-421 22.001 Standard – Incident Management – CURRENT.DOCX
- 2.1 EL5 A5.1.1 HW2006-2906 2 6.006 Water Quality Monitoring Plan.DOC
- 2.1 EL5 A5.1.2 HW2006-2906 2 6.006 Water Quality Monitoring Plan.DOC
- 2.1 EL5 A5.1.3 - Register - ALS Lab Contract Audit Inspection Register.XLS
- 2.1 EL5 A5.1.3 HW2013-421 9.008 Register - 2015 - 2018 Internal Audit Schedule.XLSX
- 2.1 EL5 A5.1.3 HW2015-1449 1 9.002 Statement - Example certificate of analysis.PDF
- 2.1 EL5 A5.2.1 HW2008-235 13.061 Form - Competency Assessment Record - Customer Service Example record.PDF
- 2.1 EL5 A5.2.1 HW2008-235 6.016 Guideline - Water Quality - Air White.DOC
- 2.1 EL5 A5.2.1 HW2008-235 6.017 Guideline - Water Quality – Chlorine.DOC
- 2.1 EL5 A5.2.1 HW2008-235 7.001 Service Fault Map.PDF
- 2.1 EL5 A5.2.1 HW2013-1079.023 Customer Complaints Handling Guidelines.DOC
- 2.1 EL5 A5.3.1 HW2006-1417 28 8.006 On-line Water Quality Performance at Gresford WTP – June 2017.pdf
- 2.1 EL5 A5.3.1 HW2014-1579 2.003 Data - Gresford WTP.XLSB
- 2.1 EL5 A5.3.2 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.pdf
- 2.1 EL5 A5.3.2 HW2006-1417 28 7.007 Report - Network Operations Report - June 2017.DOCX
- 2.1 EL5 A5.3.2 HW2006-1417 28 8.006 On-line Water Quality Performance at Gresford WTP – June 2017.pdf
- 2.1 EL5 A5.3.2 HW2006-1448519.002 Email - Resamples at Martins Creek No 1 Reservoir.MSG
- 2.1 EL5 A5.3.2 HW2014-1579 2.003 Data - Gresford WTP.XLSB
- 2.1 EL5 A5.4.1 HW2008-235 6.016 Guideline - Water Quality - Air White.DOC
- 2.1 EL5 A5.4.1 HW2008-235 6.017 Guideline - Water Quality – Chlorine.DOC
- 2.1 EL5 A5.4.1 HW2008-235 7.001 Service Fault Map.PDF
- 2.1 EL5 A5.4.1 HW2010-1986 8.023 Procedure - Water Quality Exception Reporting - Current Version.DOCX
- 2.1 EL5 A5.4.1 HW2013-1079.023 Customer Complaints Handling Guidelines.DOC
- 2.1 EL5 A5.4.1 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf
- 2.1 EL5 A5.4.2 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC
- 2.1 EL5 A5.4.2 HW2010-1986 8.023 Procedure - Water Quality Exception Reporting - Current Version.DOCX
- 2.1 EL5 A5.4.2 HW2013-421 22.001 Standard for managing incidents.DOCX
- 2.1 EL6 A6.1.1 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC
- 2.1 EL6 A6.1.1 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf
- 2.1 EL6 A6.1.1 HW2010-1986 8.023 Procedure for water quality exceptions.DOCX
- 2.1 EL6 A6.1.1 HW2011-662 14 5.002 Emergency Response Communications Plan.DOCX
- 2.1 EL6 A6.1.2 HW2015-1449 1 5.050 Minutes - Community Consultative Forum Minutes Sep16.PDF

- 2.1 EL6 A6.1.2 HW2015-1449 1 9.018 Article - Twitter Page 2of2.PNG
- 2.1 EL6 A6.1.2 HW2015-1449 1.010 Article - Twitter Page 1of2.PNG
- 2.1 EL6 A6.2.1 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC
- 2.1 EL6 A6.2.1 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf
- 2.1 EL6 A6.2.1 HW2015-1449 1 9.015 PL-ANZ-9-382-3 Crisis Management Plan.PDF
- 2.1 EL6 A6.2.1 HW2015-1449 1 9.016 PR-ANZ-9-456-4 Incident Reporting and Recording.PDF
- 2.1 EL6 A6.2.1 HW2015-1449 1 9.017 PR-ANZ-9-7314-5 Incident Investigation.PDF
- 2.1 EL6 A6.2.2 HW2015-1449 1 9.036 Emergency Management Training Material.pdf
- 2.1 EL6 A6.2.2 HW2015-1449 1 9.037 Emergency Management Training Example Attendance Sheet.pdf
- 2.1 EL6 A6.2.3 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC
- 2.1 EL6 A6.2.3 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf
- 2.1 EL6 A6.2.3 HW2010-1986 8.023 Procedure for water quality exceptions.DOCX
- 2.1 EL6 A6.2.3 HW2011-662 14 5.002 Emergency Response Communications Plan.DOCX
- 2.1 EL6 A6.2.3 HW2015-1449 1 9.015 PL-ANZ-9-382-3 Crisis Management Plan.PDF
- 2.1 EL6 A6.2.3 HW2015-1449 1 9.016 PR-ANZ-9-456-4 Incident Reporting and Recording.PDF
- 2.1 EL6 A6.2.3 HW2015-1449 1 9.017 PR-ANZ-9-7314-5 Incident Investigation.PDF
- 2.1 EL7 A7.1.1 HW2015-1449 1 9.012 DWQ Compliance Training.PDF
- 2.1 EL7 A7.1.1 HW2015-1449 1 9.013 DWQ Compliance Training Example Attendance Sheet.PDF
- 2.1 EL7 A7.1.1 HW2015-1449 1 9.020 DWQ Awareness Training Completion Report.PDF
- 2.1 EL7 A7.1.1 HW2015-1449 1 9.040 Drinking Water Quality Awareness Training Material.pptx
- 2.1 EL7 A7.1.1 Screenshot of DWQMS intranet workspace.PNG
- 2.1 EL7 A7.2.1 HW2015-1449 1 9.044 Veolia Training Matrix.pdf
- 2.1 EL7 A7.2.1 HW2015-1449 1 5.005 Email - FW Proposed Schedule for Cert III Water Operations Training.MSG
- 2.1 EL7 A7.2.1 HW2015-1449 1 5.008 Position Description for Manager Treatment Operations.DOC
- 2.1 EL7 A7.2.1 HW2015-1449 1 5.016 Report - Lab Staff Training Record Example.PDF
- 2.1 EL7 A7.2.1 HW2015-1449 1 5.018 Data - System Ops_Competency Requirements.XLS
- 2.1 EL7 A7.2.1 HW2015-1449 1 5.019 Report - Completed Competency Observations – Example.PDF
- 2.1 EL7 A7.2.1 HW2015-1449 1 5.045 File note - PD - Manager Water Network Operations.DOC
- 2.1 EL7 A7.2.2 HW2015-1449 1 9.044 Veolia Training Matrix.pdf
- 2.1 EL7 A7.2.2 HW2015-1449 1 5.005 Email - FW Proposed Schedule for Cert III Water Operations Training.MSG
- 2.1 EL7 A7.2.2 HW2015-1449 1 5.018 Data - System Ops_Competency Requirements.XLS
- 2.1 EL7 A7.2.3 HW2015-1449 1 9.012 DWQ Compliance Training.PDF
- 2.1 EL7 A7.2.3 HW2015-1449 1 9.013 DWQ Compliance Training Example Attendance Sheet.PDF
- 2.1 EL7 A7.2.3 HW2015-1449 1 9.020 DWQ Awareness Training Completion Report.PDF
- 2.1 EL7 A7.2.3 HW2015-1449 1 9.040 Drinking Water Quality Awareness Training Material.pptx
- 2.1 EL8 A8.1.2 HW2015-1055 7.002 Guideline - 2017+3 Strategy.PDF
- 2.1 EL8 A8.1.2 HW2015-1449 1 5.050 Minutes - Community Consultative Forum Minutes Sep16.PDF
- 2.1 EL8 A8.1.2 HW2015-1449 1 9.018 Article - Twitter Page 2of2.PNG

- 2.1 EL8 A8.1.2 HW2015-1449 1 9.041 PFAS Communication Strategy.doc
- 2.1 EL8 A8.1.2 HW2015-1449 1 9.042 Catchment Brochure.pdf
- 2.1 EL8 A8.1.2 HW2015-1449 1.010 Article - Twitter Page 1of2.PNG
- 2.1 EL8 A8.2.1 HW2015-1449 1 5.056 Presentation - Screenshot Hunter Water Water Quality Internet Page.JPG
- 2.1 EL8 A8.2.1 HW2015-1449 1 5.057 Presentation - Screenshot Hunter Water Catchment Management Internet Page.JPG
- 2.1 EL8 A8.2.1 HW2015-1449 1 5.058 Presentation - Screenshot Hunter Water Drinking Water Catchments Internet Page.JPG
- 2.1 EL8 A8.2.1 HW2015-1449 1 5.059 Presentation - Screenshot Hunter Water Where Does Your Water Come From Internet Page.JPG
- 2.1 EL8 C8.1.1 HW2017-480 2 12.001 Saving-the-Environment-and-Money-with-Catchment-Improvements.pdf
- 2.1 EL8 C8.1.1 HW2017-480 2 12.002 Media Release Hunter Water adopts new PFAS Guidelines.pdf
- 2.1 EL8 C8.1.1 HW2017-480 2 12.003 Media Release River Rehab and Boating Restrictions.pdf
- 2.1 EL8 C8.1.1 HW2017-480 2 12.004 Media Release PFAS_Town Water Safe to Drink.pdf
- 2.1 EL9 A9.1.1 HW2009-1367 11 10 - Sanitary Survey and Operational Monitoring Guidance - R D project.PDF
- 2.1 EL9 A9.1.1 HW2009-1367 19.008 2013-2017 R and D Plan.DOC
- 2.1 EL9 A9.1.1 HW2009-1367 25.011 Memorandum of Understanding - University of Newcastle and HWC.PDF
- 2.1 EL9 A9.1.1 HW2009-1367 32.014- In Vitro Bioassays as Assessments of Toxicity - R and D Project.PDF
- 2.1 EL9 A9.1.1 HW2009-1367 33.029- Microplastics R and D project.pdf
- 2.1 EL9 A9.1.1 HW2009-1367.030 File Note - RD Projects Register 2009-2017.XLS
- 2.1 EL9 A9.1.2 HW2006-1417 28 7.007 Report - Network Operations Report – June 2017.DOCX
- 2.1 EL9 A9.1.2 HW2006-1448 53 1.005 Presentation - May 2017 DOS Update.pptx
- 2.1 EL9 A9.1.2 HW2009-1367 11 10 - Sanitary Survey and Operational Monitoring Guidance - R and D project.PDF
- 2.1 EL9 A9.1.2 HW2009-1367 32.014- In Vitro Bioassays as Assessments of Toxicity - R and D Project.PDF
- 2.1 EL9 A9.1.2 HW2009-1367 33.029- Microplastics R and D project.pdf
- 2.1 EL9 A9.2.1 HW2006-1417 28 8.006 On-line Water Quality Performance at Gresford WTP – June 2017.pdf
- 2.1 EL9 A9.2.1 HW2006-1448 42 43.004 Minutes - Disinfection and Filtered Turbidity Targets and Critical Limits - 22 May 2013.DOC
- 2.1 EL9 A9.2.1 HW2016-1069 1 1.001 File note - revised critical limits for pH - for approval by MTO and MSO.DOCX
- 2.1 EL9 A9.2.2 HW2015-1343 4.016 Email - NSW Health Satisfaction of Hunter Water CCPs – 28062017.MSG
- 2.1 EL9 A9.2.2 HW2016-1069 1 1.001 File note - revised critical limits for pH - for approval by MTO and MSO.DOCX
- 2.1 EL9 A9.3.1 HW2007-2744 5.082 Guideline - QG052 Design Validation Guideline (in Integrum) – CURRENT.DOCX
- 2.1 EL9 A9.3.1 HW2015-1449 1 5.060 Presentation - Screenshot Hunter Water Design Manual Page.JPG
- 2.1 EL9 A9.3.1 HW2015-1449 1 5.061 Presentation - Screenshot Approved Produces and Manufacturers Internet Page.JPG

- 2.1 EL10 A10.1.1 HW2014-778 15 2.002 Plan - Drinking Water Quality Management Plan - Veolia 17.02.2017.DOC
- 2.1 EL10 A10.1.1 HW2015-1303 9.001 Report - Hunter Water Drinking Water Quality Management System.DOCX
- 2.1 EL10 A10.1.2 HW2012-441 9 1.002 Procedure – Manage Document Control.DOCX
- 2.1 EL10 A10.1.2 HW2013-421 22.002 Standard - Corporate Document Control - CURRENT.DOCX
- 2.1 EL10 A10.1.2 HW2015-1449 1 9.030 PR-ANZ-1-439-4 Document Management.PDF
- 2.1 EL10 A10.1.2 HW2015-1449 1 9.031 PR-HW-1-7694-1 Hunter Water Records Management.PDF
- 2.1 EL10 A10.1.3 HW2015-1449 1 9.008 Article - Screenshot of TRIM Workspace.PNG
- 2.1 EL10 A10.1.4 HW2012-441 9 1.002 Procedure – Manage Document Control.DOCX
- 2.1 EL10 A10.1.4 HW2013-421 22.002 Standard - Corporate Document Control - CURRENT.DOCX
- 2.1 EL10 A10.2.1 HW2008-704 17.004 Procedure - CURRENT - Enterprise Risk Management Framework.PDF
- 2.1 EL10 A10.2.1 HW2010-1986 8.023 Procedure - Water Quality Exception Reporting - Current Version.DOCX
- 2.1 EL10 A10.2.1 HW2012-778 60.001 Data - Compliance Calendar – June 2017.xlsx
- 2.1 EL10 A10.2.1 HW2013-421 22.001 Standard – Incident Management – CURRENT.DOCX
- 2.1 EL10 A10.2.1 HW2013-421 9.007 Register - Summary of Corporate Reporting Requirements.XLSX
- 2.1 EL10 A10.2.2 HW2006-1448 41 7.010 Report - Quarterly to NSW Health - DW and RW Quality Exceptions April to June 2017.DOC
- 2.1 EL10 A10.2.2 HW2007-1642 33 3.012 Email - HWC Fluoride Report - June 2017.EML
- 2.1 EL10 A10.2.2 HW2009-1194137.0010 Report - Compliance and Performance report 2016-17.PDF
- 2.1 EL10 A10.2.2 HW2012-778 60.001 Data - Compliance Calendar – June 2017.xlsx
- 2.1 EL10 A10.2.2 HW2012-807 14.035 Report - Monthly Drinking Water Quality Summary - June 2017.PDF
- 2.1 EL10 A10.2.2 HW2013-421 9.007 Register - Summary of Corporate Reporting Requirements.XLSX
- 2.1 EL11 A11.1.1 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF
- 2.1 EL11 A11.1.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
- 2.1 EL11 A11.1.2 HW2006-1417 28 7.007 Report - Network Operations Report - June 2017.DOCX
- 2.1 EL11 A11.1.2 HW2006-1417 28 8.006 On-line Water Quality Performance at Gresford WTP – June 2017.pdf
- 2.1 EL11 A11.1.2 HW2014-1579 2.003 Data - Gresford WTP.XLSB
- 2.1 EL11 A11.1.2HW2006-1417 28 7.005 Email - Zone Mean Trends - Update for May 2017 - No Notable Issues Identified.MSG
- 2.1 EL11 A11.2.1 HW2013-421 11.002 Procedure - Conduct Management System Internal Audit – CURRENT.DOCX
- 2.1 EL11 A11.2.1 HW2013-421 9.008 Register - 2015 - 2018 Internal Audit Schedule.XLSX
- 2.1 EL11 A11.2.1 HW2014-778 15 9.018 Report - Audit of Veolia s DWQMS - Water Futures - 2017.pdf
- 2.1 EL11 A11.2.1 HW2015-106 7 2.001 Register - ALS Lab Contract Audit Inspection Register.XLS
- 2.1 EL11 A11.2.1 HW2015-1449 1 5.052 Report - Audit Records July 16.PDF
- 2.1 EL11 A11.2.1 HW2015-1449 1 9.043 Procedure - PR-ANZ-1-475 Audit.pdf

- 2.1 EL11 A11.2.2 HW2006-1417 28 8.013 Minutes - July 2017 Water Quality Committee Meeting.DOCX
- 2.1 EL11 A11.2.2 HW2013-1447 1 21.008 Report - Quality Audit -Drinking Water Gresford Supply System - May 2017.DOCX
- 2.1 EL11 A11.2.2 HW2013-1447 2.022 Report - Pre-reading for management Systems Review August 2017.DOCX
- 2.1 EL11 A11.2.2 HW2013-1447 2.025 Minutes - Management System Review Meeting 14 August 2017.DOCX
- 2.1 EL11 A11.2.2 HW2013-421 11.002 Procedure - Conduct Management System Internal Audit – CURRENT.DOCX
- 2.1 EL12 A12.1.1 HW2006-1417 28 8.013 Minutes - July 2017 Water Quality Committee Meeting.DOCX
- 2.1 EL12 A12.1.1 HW2013-1447 2.002 Report - Pre-reading for Management Systems Review August 2017.DOCX
- 2.1 EL12 A12.1.1 HW2013-1447 2.025 Minutes - Management System Review Meeting 14 August 2017.DOCX
- 2.1 EL12 A12.1.1 HW2015-1449 1 5.034 Procedure - PR-ANZ-1-476 Management Review Procedure.PDF
- 2.1 EL12 A12.1.2 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.DOCX
- 2.1 EL12 A12.1.2 HW2006-1417 28 8.013 Minutes - July 2017 Water Quality Committee Meeting.DOCX
- 2.1 EL12 A12.1.2 HW2013-1447 2.002 Report - Pre-reading for Management Systems Review August 2017.PPTX
- 2.1 EL12 A12.1.2 HW2013-1447 2.025 Minutes - Management System Review Meeting 14 August 2017.DOCX
- 2.1 EL12 A12.2.1 HW2013-830 8 1.007 Data-Risk Driver Analysis Summ Table-Non-compliance with agreed WQ standards (incl CM).pdf
- 2.1 EL12 A12.2.1 HW2015-1449 1 9.007 Article - Drinking Water Quality Improvement Plan Actions.pdf
- 2.1 EL12 A12.2.2 HW2007-973 44 1.008 Board Paper - Drinking Water Quality Management System Update - October 2016.DOC
- 2.1 EL12 A12.2.2 HW2006-1417 28 8.013 Minutes - July 2017 Water Quality Committee Meeting.DOCX
- 2.1.1 HW2013-421 2.003 Report - Integrated Management System (1).pdf
- 2.1.1 HW2013-421 2.003 Report - Integrated Management System.pdf
- 2.1.1 HW2015-1303 9.001 Report - Hunter Water Drinking Water Quality Management System.pdf
- 2.1.1 HW2015-1449 1 9.021 Drinking Water Quality Management Plan – Veolia.pdf
- 2.1.2 HW2006-2906 2 6.006 Water Quality Monitoring Plan.pdf
- 2.1.2 HW2006-2906 8 33.014 Drinking Water Quality Risk Assessment Calendar.pdf
- 2.1.2 HW2006-2968 41 44.001 Policy - Drinking Water Policy - PDF – CURRENT.pdf
- 2.1.2 HW2014-778 15 2.007 Gresford WTP - HACCP Limit Table.PDF
- 2.1.2 HW2015-1303 9.001 Report - Hunter Water Drinking Water Quality Management System.pdf
- 2.1.2 HW2015-1449 1 9.007 Article - Drinking Water Quality Improvement Plan Actions.pdf
- 2.1.2 HW2015-1449 1 9.021 Drinking Water Quality Management Plan – Veolia.pdf
- 20151125 Project Development Plan.pdf
- 20151126 Turbidity Meter Trial.pdf
- 20160219 RFP Scope of Work - Mechanical.pdf
- 20160229 RFP Scope of Work - Electrical.pdf
- 20160308 RFP Evaluations.pdf

- 20160308 Variation.pdf
- 20160411 Letter of Approval.pdf
- 20160505 CapitalWorks_ValueAdded.pdf
- 20160505 Project Charter.pdf
- 20160603 SWMS - NCM.pdf
- 20160608 PLC_SCADA Scope of Works.pdf
- 20160705 Change request.pdf
- 20160705 SWMS - JA Martin.pdf
- 20160906 SWMS - JA Martin.pdf
- 20161024 Calibration Certificates Filters 1-9.pdf
- 20161024 Calibration Certificates Filters 10-16.pdf
- 20161107 Commissioning - JA Martin.pdf
- 20161116 Turbidity Meter Upgrade Training.pdf
- 20161213 Project Document Transmittal.pdf
- 20170629 Hunter Water post install inspection.pdf
- 20171019 Project Closeout Checklist.pdf
- 20171019 Transaction Summary.pdf
- 20171020 Project Completion Notification.pdf
- AOMS 503261.jpg
- DWQ Additional Evidence Register - Part II.docx
- DWQ Currency Clarification.docx
- Emergency Response Communications Plan.DOCX
- Hunter Water Training Register - Dec 2016.xlsm
- HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.pdf
- HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.pdf
- HW2006-1417 28 5.012 Minutes - April 2017 Water Quality Committee Meeting.pdf
- HW2006-1417288.014 Report - Monthly Catchment Report - June 2017.PDF
- HW2006-1448 52 2.002 Register - CWT Reservoir Inspection Report March 2017.xlsx
- HW2008-2356.019 - Dirty Water Service Fault.doc
- HW2013-421 9.006 Register - Legal and Other Requirements - Quality - CURRENT.xlsx
- HW2014-778 15 2.007 Register - Gresford WTP HACCP Limit Table 29012017.pdf
- HW2015-1365 18.006 Report - Anna Bay WTP Risk Assessment Summary Report.pdf
- HW2015-1365 18.008 Report - Lemon Tree Passage WTP Risk Assessment Summary Report.PDF
- HW2015-1365 18.010 Report - Grahamstown WTP Risk Assessment Summary Report.pdf
- HW2015-1365 8 3.003 Report - Lemon Tree Passage WTP Risk Assessment Summary Report.DOCX
- HW2015-1449 1 5.019 Report - Completed Competency Observations - Example.pdf
- HW2015-1449 1 5.020 Report - System Controller Competency Assessment Form-Example.pdf
- HW2015-1449 1 9.051 Sampling officer Training Record example.pdf
- HW2015-1449 1 9.052 Sampling technique retraining example.pdf
- HW2015-1449 1 9.053 Induction Training Register example.xlsx
- HW2015-1449 1 9.054 Email - 2016-2017 - Quality Training Report.pdf
- HW2015-1449 1 9.055 Edmore Material - Change Request.docx
- HW2015-1449 1 9.055 Edmore Material - Change Request.docx
- HW2015-1449 1 9.056 Re Drinking Water Quality Awareness Module.msg
- HW2015-1449 1 9.056 Re Drinking Water Quality Awareness Module.msg
- HW2015-1449 1 9.057 Position Description HR Coordinator.doc
- HW2015-1449 1 9.058 Learning and Development Advisor.doc

- HW2015-1449 1 9.060 Position Description Senior HR Business Partner Learning and Development.docx
- HW2015-1449 1 9.062 Training Budget 2016-2017.xlsm
- HW2015-1449 1 9.062 Training Budget 2016-2017.xlsm
- HW2015-1449 1 9.063 WQ Awareness Invoice 2of2.pdf
- HW2015-1449 1 9.063 WQ Awareness Invoice 2of2.pdf
- HW2015-1449 1 9.064 WQ Awareness Invoice 1of2.pdf
- HW2015-1449 1 9.064 WQ Awareness Invoice 1of2.pdf
- HW2015-144919.047 Email to NSW Health and Update - re Elevated concentration of Microcystis 21 April 2017.msg
- HW2015-144919.047 Email to NSW Health and Update - re Elevated concentration of Microcystis 21 April 2017.msg
- HW2015-144919.048 Email to NSW Health Notification and Update - Elevated Cylindrospermopsis 21st March.msg
- HW2015-144919.048 Email to NSW Health Notification and Update - Elevated Cylindrospermopsis 21st March.msg
- HW2015-144919.049 Emails to and from NSW Health and Update results of Microcystis - 4th April 2017.msg
- HW2015-144919.049 Emails to and from NSW Health and Update results of Microcystis - 4th April 2017.msg
- Item 11 CWT Reservoir Inspection Report Register.pdf
- Item 1a PD - Technical Services Manager - Hunter.pdf
- Item 1b PD - Mgr Reporting Risk and Compliance - Hunter.pdf
- Item 5 REF-HWT-20-8089-4 Anna Bay HACCP Limit Table.pdf
- Item 6a Incident 0240-W-GRE.pdf
- Item 6b Corporate Mail - Gresford and LTP early warning report.pdf
- Item 7 Fluoride Ticket - Veolia Staff Member
- Item 8 Coagulant research - Dungog WTP.pdf
- Item 9 Monthly Contract Report - Innovations.pdf
- Training Matrix - December 2016.xlsx

Summary of reason for grade

A summary of element-by-element findings for consistency against this clause is presented in Table B-2.

Table B-2. Element-by-element summary of findings for clause 2.1.1

Element	Grade	Key Findings
1: Commitment to Drinking Water Quality Management	Full	A drinking water quality policy is in place and current. Regulatory and formal requirements are in place with a procedure for updating requirements. Stakeholders are identified and engagement processes are in place.
2: Assessment of the Water Supply System	High	A process is in place for preparing inputs to the risk assessment including flow diagrams and water quality data analysis and for undertaking rolling risk assessment reviews. A process is in place for assembling a water quality risk assessment team from relevant personnel including Hunter Water and the treatment operations contractor. Water Quality Committee terms of reference are in place and maintained. A risk assessment framework is in place. Field verification of flow diagrams was verbally confirmed for the Lemon Tree Passage WTP and corroborated by evidence to show retiring of risks in the risk assessment after revision using the updated flow diagram. One minor shortcoming was identified in consistency with the formal requirement to field verify the flow diagrams i.e. no formal requirement could be found which requires field verification of the flow diagrams.

Element	Grade	Key Findings
3: Preventive Measures for Drinking Water Quality Management	High	There is a process in place to identify preventive measures in assessing residual risk. There is a process in place to capture and act on actions from the risk assessment. There is an ongoing process in place to develop Framework consistent CCPs, with review of CT limits as an ongoing action. There is a formal process to involve NSW Health in CCP development. NSW Health notes that significant progress in the review of critical limits has been made, although further work is required to complete CCPs to its satisfaction and for consistency with the ADWG. This element has been found to have high compliance due to CCPs not yet being finalised.
4: Operational Procedures and Process Control	High	Operational procedures and processes are generally in place with evidence provided of WTP operating manuals and HACCP response plans. Operational monitoring is documented in the Drinking Water Quality Plan and HACCP tables for each WTP. An issue was noted concerning procedures and information in SCADA as a result of the self-reported Hunter Water CCP non-compliance at the Four Mile Creek chlorinator. Refer to Table 2-1 for further information.
5: Verification of Drinking Water Quality	Full	A verification monitoring program is in place (documented in the Drinking Water Quality Monitoring Plan) with evidence provided for Gresford WTP. A process is in place for consumer complaints and response, including a system of training of front line staff. Procedures are in place to review water quality data and notification protocols for exception reporting.
6: Management of Incidents and Emergencies	High	Communication and incident and emergency management protocols are in place. A requirement exists to undertake emergency scenario training every two years. The Water Quality Committee is tasked with reviewing water quality exceptions and variations including corrective action efficacy. Hunter Water self-reported a non-compliance for incident management of CCP chlorinator breaches at the Four Mile Creek chlorinator. Refer to Table 2-1 for further details.
7: Employee Awareness and Training	High	Good processes are in place for ensuring employee awareness and involvement across the organisation as well as the water treatment contractor. Solid training programs and learning and development support personnel are in place. This element receives a 'noteworthy effort' for consistency in overarching water quality awareness. However, we found some shortcomings associated with the training for management of the chlorinator CCP (see Table 2-1).
8: Community Involvement and Awareness	Full	A dedicated community and stakeholder team is in place. A Community Consultative Forum exists and occurs three times a year. Hunter Water is in the process of formalising stakeholder and community engagement in a Stakeholder Engagement Standard and Procedure with customers and stakeholder engagement covered by the 2017+3 Strategy, for the audit date scope.
9: Research and Development	Full	Programs have been established to increase system understanding, and are documented in Hunter Water's 4 year research and development plan and register. Systems are in place to validate and revalidate processes, and are documented in Hunter Water's Design Validation Guideline document.

Element	Grade	Key Findings
10: Documentation and Reporting	Full	Systems are in place for the management of documents and records (for Hunter Water and the treatment contractor) which are consistent with Framework requirements. Personnel are trained in how to use the systems. A corporate compliance calendar and register are in place to track reporting requirements.
11: Evaluation and Audit	Full	Formal audit procedures and schedules are in place including formal avenues for review of findings.
12: Review and Continual Improvement	Full	Hunter Water and the treatment contractor have formal processes in place for review of the management system. A Drinking Water Quality Management Improvement Plan is in place with systems to support its implementation. The treatment contractor has a formal innovation process in place.

Discussion and notes

See detailed discussion below (Element-by-element discussion of the Framework for Management of Drinking Water Quality).

Recommendations

Recommendation 2.1.1-1: To avoid repetition of incidents, ensure that a system is in place (e.g. through the functions of the Water Quality Committee) to check incidents for trends and flag any that have happened previously (by 30 September 2018).

Opportunities for improvement

OFI 2.1.1 E3-1: Review whether the booster chlorinators should be defined as a critical control point and if Hunter Water chooses to keep them as a CCP, review the appropriateness of the upper limit.

Clause 2.1.2

Table B-3. Clause 2.1.2 compliance grade.

Subclause	Requirement	Compliance grade
2.1.2	Hunter 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 system, including to the satisfaction of NSW Health.	Adequate

Risk	Target for full compliance
Waterborne outbreaks from mis-management of drinking water quality still occur in the developed world and therefore, the risk posed to public health from non-compliance with this clause could be significant.	Systems and processes in place to ensure implementation of the Drinking Water Quality Management System in practice across the overall catchment to consumer supply chain (depending on properly identified responsibilities and accountabilities for system components). Evidence to show that NSW Health is satisfied with the Drinking Water Quality Management System and its implementation.

Evidence sighted

See evidence for clause 2.1.1.

Summary of reason for grade

A summary of element-by-element findings for consistency against this clause is presented in Table B-4.

Table B-4. Element-by-element summary of findings for clause 2.1.2.

Element	Grade	Key Findings
1: Commitment to Drinking Water Quality Management	Full	Awareness of the drinking water quality policy is in place and was on display at the field audit sites. Drinking water quality awareness training is undertaken in practice (see Element 7). Legal and formal requirements are updated periodically according to the procedure. Position descriptions and training are used to capture responsibilities. Evidence to confirm engagement with stakeholders in practice (internal and external) was sighted (see also Element 8).
2: Assessment of the Water Supply System	Full	Preparation of risk assessment inputs is implemented through briefing papers prepared for each risk assessment workshop. Papers contain summaries of legal and formal requirements, system information, flow diagrams and water quality data analyses. Updated flow diagrams are in place (see Recommendation 15/16-01 for more information). Workshop output papers (including attendees) and updated risk registers are available as evidence of risk review completion. Minutes show implementation of the Water Quality Committee meetings. Evidence was provided to confirm site verification for the Lemon Tree Passage WTP in practice.
3: Preventive Measures for Drinking Water Quality Management	Full	Evidence was provided of CCP implementation. Even though the CT CCP was noted as being interim, it is implemented in practice. The self-reported Hunter Water non-compliance for the CCP chlorinator breaches at the Four Mile Creek chlorinator are captured in other elements. Refer to Table 2-1 for further detail.
4: Operational Procedures and Process Control	Adequate	Operational procedures and processes are in place with evidence provided of WTP operating manuals and HACCP response plans. Processes for operational monitoring are in place and CCPs are monitored and controlled using SCADA. Not all SCADA system limits have been updated. Hunter Water noted that updates to the Treatment Operations Contract Practice Note PN111 and critical limit alarm in SCADA are being updated in the 2017-18 financial year.

Element	Grade	Key Findings
		Elermore Vale Reservoir field audit revealed shortcomings with the inspection process resulting in a potential exposure pathway for water contamination not being identified for a number of months.
5: Verification of Drinking Water Quality	Full	Evidence was provided to confirm implementation of the verification monitoring program. Monthly water quality summaries, exception reports and water quality committee meetings ensure that review and analysis of verification monitoring data are undertaken.
6: Management of Incidents and Emergencies	Adequate	Evidence was provided to show that the communication and incident and emergency management protocols in place are generally implemented in practice. An emergency training scenario had been completed during the audit date scope (which shows that emergency training is undertaken) however, the scenario was not for a water quality incident so this specific emergency scenario could not be tested. We were advised that no procedures had been revised as a result of debriefs. In its 2016-17 Statement of Compliance, Hunter Water noted that the reporting non-compliance for the Four Mile Creek CCP breach did not trigger a review of the emergency and incident procedures as one of the remedial actions. The four non-compliances should also have triggered a review of the emergency and incident procedures. We have provided a recommendation to review emergency and incident procedures based on the CCP breach as well including a CCP breach as a future emergency training scenario. Refer also to Table 2-1.
7: Employee Awareness and Training	High	Evidence was provided to show that training and awareness is implemented in practice for both the organisation and the water treatment contractor. Records were provided to demonstrate training including in awareness and required job competencies. Budget information was provided to demonstrate that training had been well-resourced within the audit period. This element receives a 'noteworthy effort' for implementation of overall water quality awareness training. However, we found some shortcomings associated with the training for management of the chlorinator CCP (see Table 2-1).
8: Community Involvement and Awareness	Full	Evidence was sighted to demonstrate implementation of the community involvement and awareness programs including catchment management brochure, social media examples and information relating to current issues including PFOA/PFAS.
9: Research and Development	Full	Evidence was provided of research and development partnerships and investigation studies being undertaken. Veolia provided evidence of processes for innovation and improved efficiencies and reporting to Hunter Water. Hunter Water provided a range of evidence to support implementation in this area including a revised CCP critical limit for pH and a Disinfection Optimisation Strategy to improve the persistence of chlorine residual for effective disinfection in the distribution system.
10: Documentation and Reporting	Adequate	Documentation and reporting is generally implemented in practice. However during the audit date scope, a series of reporting non-compliances occurred. We feel that the non-compliance of reporting represents a number of minor shortcomings as, although there was no impact on public health, it was an event that happened on four occasions and is therefore awarded adequate compliance.
11: Evaluation and Audit	Full	Audits are undertaken in practice for Hunter Water and its contractors. Audit reports confirmed that audits occurred. Evidence was provided to demonstrate how results are reviewed by relevant senior personnel.

Element	Grade	Key Findings
12: Review and Continual Improvement	Full	Evidence was provided to show how the system is reviewed by senior management. The Drinking Water Quality Management Plan is in place and implemented in practice. To test the overall process, we requested and were provided with information to show how Hunter Water and the treatment contractor had worked together to identify and remediate issues associated with turbidity meters at Grahamstown WTP. The approach and records demonstrate a noteworthy effort, showing an effective partnership between the contractor and Hunter Water and implementation of improvement in practice.

Discussion and notes

See detailed discussion below (Element-by-element discussion of the Framework for Management of Drinking Water Quality).

Recommendations

Recommendation 2.1.2-1: By 30 September 2018, ensure that all emergency and incident management procedures are reviewed, and revised if necessary, based on the Four Mile Creek CCP reporting breach (July 2016 and June 2017).

Recommendation 2.1.2-2: For the next scheduled emergency scenario training exercise, include a CCP breach as the example.

Recommendation 2.1.2-3: By 30 September 2018, ensure that all personnel involved in undertaking reservoir inspections undertake training in the importance of accurately completing the reservoir inspection forms, including the records associated with the inspection.

Opportunities for improvement

OFI 2.1.2 E2-1: Ensure that at the next review, all risk assessments use the revised flow diagrams.

OFI 2.1.2 E4-1: At the next review, ensure that all water treatment plant operating manuals include the revised flow diagrams.

OFI 2.1.2 E4-2: Develop and implement a formal approach to changing over the raw water input for the Gresford Water Treatment Plant between the Allyn and Paterson River sources.

OFI 2.1.2 E4-3: Ensure that the person writing notes in the plant diary identifies themselves against their entry to confirm responsibility.

OFI 2.1.2 E7-1: Given recent drinking water contamination incidents including Havelock North (NZ) and Flint (Mi, USA), consider having a requirement for refresher water quality awareness training after a given period of time (with updated case studies).

OFI 2.1.2 E7-2: Consider whether it would be useful to require staff and contractors to undergo fluoride refresher training (given that the certificate reviewed as evidence was for certification achieved more than 20 years ago).

OFI 2.1.2 E11-1: Formalise the DWQMS auditing requirements in the Internal Audit Schedule (other than those in the contract) for the treatment operations contractor.

Element-by-element discussion of the Framework for Management of Drinking Water Quality

1 Commitment to Drinking Water Quality Management

This element covers the drinking water quality policy, identification of regulatory and formal requirements and identification and engagement with stakeholders.

Drinking water policy: A drinking water quality policy is in place and was endorsed[27] by the Managing Director. Drinking water quality awareness was sighted[28] on the online learning portal. See also Element 7 for training evidence.

Regulatory and formal requirements: Hunter Water manages its regulatory and other obligations via its IMS which includes a specific procedure[29] covering safety, environmental, and quality requirements. Drinking water is covered through:

> *"Quality of Hunter Water's Products and Services"*[30]

Supporting systems for the procedure include two registers[31] and a compliance[32] calendar (Compliance and Commitments Tracker). The Compliance and Commitments Tracker was reviewed and several items relating to drinking water compliance were confirmed and met the audit date scope e.g. changes to water quality management system. Updates of legal and other obligations are covered by the procedure. Standard AS/NZS 4020 was confirmed as not being included because it is covered by the WSAA Codes used by Hunter Water (we confirmed this is the case).

Position descriptions are used to capture responsibilities. Position descriptions[33] confirm the approach and audit interviews corroborated the position description responsibilities. Position descriptions were also checked for the treatment operations contractor. Responsibilities relating to water treatment and support for delivery of systems were confirmed.[34]

Engaging stakeholders:

Hunter Water's Emergency Management Plan (EMP)[35] contains contact details of key internal and external stakeholders. Contact lists commence at Section 17 of the document. The contact lists are comprehensive and adequate. Hunter Water notes that the contact lists are reviewed on an annual basis and provided a Business Resilience Calendar[36] as evidence of review.

Contact details[37] were provided for NSW Health (local representatives and the Water Unit). Hunter Water notes that it engages frequently with NSW Health including:

- Quarterly formal liaison meetings (senior representation)
- Notifiable water quality incidents
- Changes to the DWQMS

While the currency of the NSW Health contacts is 2015, audit interviewees confirmed that the details were still current.

Evidence was sighted to confirm that NSW Health was involved in a risk assessment workshop.

---

[27] 2.1 EL 1 A1.1.1 HW2006-2968 41 44.001 Policy - Drinking Water Policy - PDF - CURRENT.pdf (Version 3, June 2017).
[28] 2.1 EL1 A1.1.2 HW2015-1449 1 9.011 Article - eLearning Portal.PNG
[29] 2.1 EL 1 A1.2.1 HW2012-441 23 1.029 Procedure - Managing Legal and Other Requirements – CURRENT.docx (Version 4, authorised 27/08/2017 noting that this dates meets the documented review cycle which was July 2017).
[30] 2.1 EL 1 A1.2.1 HW2012-441 23 1.029 Procedure - Managing Legal and Other Requirements – CURRENT.docx (Version 4, authorised 27/08/2017 noting that this dates meets the documented review cycle which was July 2017), p1.
[31] 2.1 EL 1 A1.2.1 HW2013-421 9.007 Register - Summary of Corporate Reporting Requirements.pdf; 2.1 EL 1 A1.2.1 HW2013-421 9.006 Register - Legal and Other Requirements - Quality – CURRENT.pdf (noting that a version was also provided that was within the audit date scope; HW2013-421 9.006 Register - Legal and Other Requirements - Quality - CURRENT.xlsx 27/6/2017).
[32] 2.1 EL 1 A1.2.1 HW2012-778 60.001 Data - Compliance Calendar - June 2017.xlsx.
[33] 2.1 EL1 A1.2.2 HW2015-755 21.019 Position Description - Manager Water Network Operations.pdf; 2.1 EL1 A1.2.2 HW2015-755 21.021 Position Description - Manager Treatment Operations.pdf.
[34] Item 1a PD - Technical Services Manager - Hunter.pdf; Item 1b PD - Mgr Reporting Risk and Compliance - Hunter.pdf.
[35] 2.1 EL1 A1.3.1 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf (version 6 September 2016; next review due December 2017).
[36] 2.1 EL1 A1.3.1 HW2014-1242 4 2.004 Business Resilience Calendar.xlsx (row 27).
[37] 2.1 EL1 A1.3.1 HW2006-2906 4 6.010 Register - Contact Details NSW Health current September 2015.pdf.

Hunter Water also maintains individual registers of contact details for other key stakeholders, which are of particular relevance to drinking water management:

- NSW Health (as noted above)
- Veolia (as the treatment contractor)[38]
- Laboratory staff (as sampling and analysis contractor)[39]

Hunter Water is involved in a number of stakeholder engagements with a range of objectives including research[40], regulatory[41], operational[42,43], and catchment management.[44]

2 Assessment of the Water Supply System

This element covers assessment of the water supply system, water quality data and the need to undertake a hazard identification and risk assessment.

Water supply system analysis: Hunter Water notes that it may involve a range of people for the risk assessment workshop depending on the system. Examples were checked for Gresford[45] and the attendees confirmed Hunter Water's position. The attendees were appropriate for the system. A Water Quality Committee also exists[46] which has monthly meetings, at which water quality and system risks are discussed. Evidence was also provided to confirm liaison with NSW Health[47] as an important stakeholder in the system analysis and discussion.

Hunter Water states that it has developed a range of flow diagrams including catchment to tap flow diagrams for all of its water supply systems, process flow diagrams for all of its water treatment plants and a distribution system diagram. The flow diagrams are supported by diagrams on SCADA. Evidence was reviewed for Dungog[48] and Gresford[49] WTPs, Gresford[50] and Dungog[51] catchment to tap diagrams and the distribution system[52] diagram. Diagrams are representative and have been reviewed by relevant personnel.

Hunter Water notes that system information is collated prior to undertaking the risk assessment. Inputs for the risk assessment process are summarised into a workshop briefing paper. Outputs are

[38] 2.1 EL1 A1.3.1 HW2015-1449 1 5.013 Data - Veolia Staff Contact Details Aug 2016.pdf.
[39] 2.1 EL1 A1.3.1 HW2015-1449 1 5.015 File note - Lab Staff Contact Details Aug 2016.pdf.
[40] University of Newcastle 2.1 EL 1 A1.3.2 HW2009-1367 25.011 MOU - UON Science & IT and HWC.PDF (effective to 31 October 2018)
[41] 2.1 EL 1 A1.3.2 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.pdf.
[42] 2.1 EL1 A1.3.2 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.pdf (7/9/17 – while out of audit date scope, the previous version, within date scope, was also provided 4/12/16).
[43] 2.1 EL 1 A1.2.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.pdf.
[44] 2.1 EL1 A1.3.2 HW2012-369 3 5.005 Signed CMA Hunter Water MoU.PDF – document terminates 30 June 2017. Clarification was sought from Hunter Water. Response was: "*The nominal scheduled review date was September 2016 however this was not undertaken due to other priorities and because no significant updates were identified as being required to the document. The procedure was considered to remain current over the audit period.*" 2.1 EL1 A1.3.2 HW2013-1244 1.012 HWC and LLS agreement - Dairy Project.PDF (effective date 25 June 2014).
[45] 2.1 EL2 A2.1.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.pdf (for workshop held 15 September 2016).
[46] 2.1 EL2 A2.1.1 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.DOC (7 September 2017).
[47] 2.1 EL2 A2.1.1 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.DOCX (7 June 2017).
[48] 2.1 EL2 A2.1.2 HW2015-705 1.002 Dungog WTP.pdf (16/01/2017, Revision 2, reviewed by Veolia).
[49] 2.1 EL2 A2.1.2 HW2015-705 1.004 Gresford WTP .pdf (16/01/2017, Revision 2, reviewed by Veolia).
[50] 2.1 EL2 A2.1.2 HW2015-1365 16.003 Gresford Water Supply System.pdf (22/06/2017, Revision 1, reviewed by Hunter Water).
[51] 2.1 EL2 A2.1.2 HW2015-1365 16.005 Dungog Water Supply System.pdf (22/06/2017, Revision 1, reviewed by Hunter Water).
[52] 2.1 EL2 A2.1.2 S09-13 16 1.005 Distribution Network.PDF – noting that this file contains diagrams for all of Hunter Water's distribution systems (07/06/2017).

contained in a workshop summary paper and a risk register. Evidence[53] was provided for the Gresford system. The workshop briefing paper was confirmed as including system information including water quality summary[54] and analysis.

Assessment of water quality data: Hunter Water notes that system information is collated prior to undertaking the risk assessment. Inputs for the risk assessment process are summarised into a workshop briefing paper. Outputs are contained in a workshop summary paper and a risk register. Evidence[55] was provided for the Gresford system. The workshop briefing paper and summary were confirmed as including a summary and analysis of water quality.

We also confirmed, as stated by Hunter Water, that other modes are used for assembly and analysis of water quality data including via the monthly Water Quality Committee meetings, a network operations report[56] and a monthly catchment report. We sighted evidence to show that exceedances are listed and examined e.g. for Gresford, a monthly report[57] of selected parameters shows a field for collation of any breaches (none had occurred for the period sighted) and the risk assessment inputs showed that water quality summary and exceedances were included as part of that process (see above). Veolia is required to report any exceedances at the plants to Hunter Water as soon as practicable.[58]

Hazard identification and risk assessment: Hunter Water uses a risk methodology as set out in its Enterprise Risk Management[59] (ERM) framework. We confirmed that this approach is used by viewing the risk workshop inputs (briefing paper) and outputs (summary paper, risk register, as discussed above).

The evidence provided for Gresford[60] confirmed that risks were identified in accordance with the ERM framework including identification of risk without controls (classified as inherent risk), risk with controls (residual risk), uncertainty and notes (where needed) to facilitate clarity in the risk recording process. Hunter Water states that any risk with a high level of uncertainty is flagged for further investigation. We confirmed from the Gresford register that improvement actions are captured for high uncertainty risk events – e.g. the need to consider event-based sampling to improve the understanding of protozoa in the catchment and therefore, better assess log reduction values for the plant. Evidence of risk reviews undertaken in the audit date scope were provided and reviewed and found adequate although they had been completed using the old flow diagrams.[61]

---

[53] 2.1 EL2 A2.1.3 HW2015-1365 1.001 Register - Gresford WTP.pdf; 2.1 EL2 A2.1.3 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF (for workshops 3/4 August 2016, document 27/07/2016); 2.1 EL2 A2.1.3 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF ().

[54] Appendix D.

[55] 2.1 EL2 A2.1.3 HW2015-1365 1.001 Register - Gresford WTP.pdf; 2.1 EL2 A2.1.3 HW2015-1365 17.011 Report - Gresford WTP Risk Assessment Briefing Paper.PDF (for workshops 3/4 August 2016, document 27/07/2016); 2.1 EL2 A2.1.3 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF (for workshop 15 September 2016).

[56] 2.1 EL2 A2.2.1 HW2006-1417 28 7.007 Report - Network Operations Report - June 2017.pdf (noting that trends are assessed for many of the parameters including from 2000 to present); 2.1 EL2 A2.2.1 HW2006-1417 2810.004 Monthly Catchment Report.PDF (August 2017 – noting that a request for an audit date scope-compliant report was requested, and provided, for June 2017 HW2006-1417288.014 Report - Monthly Catchment Report - June 2017.PDF).

[57] 2.1 EL2 A2.2.3 HW2006-1417 28 8.006 On-line Water Quality Performance at Gresford WTP – June 2017.pdf (for period 01/06/2017 to 30/06/2017).

[58] Item 6a Incident 0240-W-GRE.pdf (15/4/17); Item 6b Corporate Mail - Gresford and LTP early warning report.pdf (20/4/17).

[59] 2.1 EL2 A2.3.1 HW2008-704 17.004 Procedure - CURRENT - Enterprise Risk Management Framework.PDF (noting currency issue – further explanation in relation to currency provided under clause 7.1).

[60] 2.1 EL2 A2.3.2 HW2015-1365 1.001 Register - Gresford WTP.pdf (Gresford WTP Water Quality Hazard Analysis & Critical Control Point Assessment, 15/09/2017).

[61] HW2015-1365 18.010 Report - Grahamstown WTP Risk Assessment Summary Report.pdf (18/10/16); HW2015-1365 18.006 Report - Anna Bay WTP Risk Assessment Summary Report.pdf (29/8/16).

The risk register includes information to show how each risk event has been considered for CCP status.[62] Actions identified in the risk assessment are carried through to the DWQIP (see Element 12). CCPs and limits[63] are recorded in a HACCP limit table. Two versions of the Gresford WTP HACCP limit table were provided – one within scope and a revised version (outside of the audit date scope) showing changes to the pH critical limit.[64]

Risks identified as significant in the risk assessment process are carried through into the operations manual. An example[65] was provided for Gresford. Risks are aligned to specific sections in the manual for the relevant controls and operational requirements. The operating manual currently has the old flow diagram at page 6.

We confirmed for that review and updates of the risk assessments, Hunter Water uses an approach of scheduling reviews through the DWQMS risk assessment calendar.[66] Gresford WTP risk assessment was scheduled for FY 16/17 and occurred in that timeframe.

Hunter Water states that risk ratings are reviewed and confirmed quarterly as part of the strategic risk update process which is reported to the Executive Management Team. We confirmed the output of the review[67] and that the review was undertaken during the audit date scope[68] and also confirmed the risk treatment plan.

3 Preventive Measures for Drinking Water Quality Management

This element covers the need to understand and identify all preventive measures and multiple barriers in place in the water supply system and to identify which of those are critical control points.

Preventive measures and multiple barriers: Section 3.1 of Hunter Water's DWQMP and section 2.3.1 of Veolia's DWQMP covers preventive measures and multiple barriers. Preventive measures are identified as part of the risk assessment process and documented in risk summary reports. Evidence was provided for Gresford WTP HACCP output paper.[69] Follow-up actions and improvements from risk assessments are captured in the Drinking Water Quality Improvement Plan.[70] Risk action plans are reviewed and confirmed quarterly as part of Hunter Water's strategic risk update to the Executive Management Team and as part of the annual report (Discussed in Element 10).

Critical control points: Section 3.2 of Hunter Water's DWQMP and section 2.3.2 of Veolia's DWQMP covers CCPs. Hunter Water noted that as part of the risk assessment process preventive measures managing significant risks are identified as controls and assessed to determine whether they should be defined as CCPs. Evidence was provided for Gresford WTP.[71] CCPs are detailed in HACCP tables for each WTP, with evidence provided for Gresford[72] and Anna Bay.[73]

Significant changes were made to the CCP limits for pH; a file note documenting changes to HACCP tables was presented as evidence.[74] The file states that pH limits were changed to be consistent with

[62] 2.1 EL2 A2.3.2 HW2015-1365 1.001 Register - Gresford WTP.pdf (Gresford WTP Water Quality Hazard Analysis & Critical Control Point Assessment, 15/09/2017) (column relating to "Critical control point confirmation and detail").
[63] 2.1 EL2 A2.3.5 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf (Issue Date: 05.10.2017).
[64] HW2014-778 15 2.007 Register - Gresford WTP HACCP Limit Table 29012017.pdf (29/1/17) and 2.1 EL2 A2.3.5 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.pdf Issue (05/10/17).
[65] 2.1 EL2 A2.3.5 HW2015-1449 1 9.022 Gresford WTP Operating Manual.pdf (28/09/2017).
[66] 2.1 EL2 A2.3.6 HW2006-2906 8 33.014 Drinking Water Quality Risk Assessment Calendar.pdf.
[67] 2.1 EL2 A2.3.6 HW2013-830 8 1.007 Data-Risk Driver Analysis Summary Table-Non-compliance agreed WQ standards (including CM).pdf.
[68] 19/05/2017.
[69] 2.1 EL3 A3.1.2 HW2015-1365 1.001 Register - Gresford WTP.pdf
[70] 2.1 EL3 A3.1.2 HW2015-1449 1 9.007 Article - Drinking Water Quality Improvement Plan Actions.pdf
[71] 2.1 EL3 A3.2.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report.PDF
[72] 2.1 EL3 A3.2.1 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table.PDF
[73] Item 5 REF HWT-20-8089 Anna Bay HACCP Limit Table.PDF
[74] 2.1 EL9 A9.2.2 HW2016-1069 1 1.001 File note - revised critical limits for pH - for approval by MTO and MSO.docx

the US EPA CT table that the CT CCP limits are based on. Review and improvement of CCPs was noted in the audit interviews to be ongoing in 2017-18, with CT CCPs not yet being finalised. In their letter dated 29 August 2017, NSW Health noted:

> *"Hunter Water Corporation continued to work with NSW Health to review the critical limits and operation against Critical Control Points (CCPs) for drinking water treatment plants. Whilst this work has progressed significantly, it remains an important piece of work requiring finalisation. An issue contributing to delaying the finalisation of CCPs is the setting of appropriate disinfection conditions (chlorine concentration and contact time or C.t) consistent with the Australian Drinking Water Guidelines"*

In their letter dated the 31 August 2017[75], Hunter Water declared four non-compliances against the CCP at Four Mile Creek Chlorinator that were not reported immediately. The critical limit of greater than 4.5 mg/L for greater than 15 continuous minutes was exceeded on 17 July 2016 and 22 July 2016 which was verbally advised to NSW Health on 29 July 2016. Two further exceedances occurred on 3 June 2017 and 10 June 2017 that were reported to NSW Health on 20 June 2017. These shortcomings are captured in other elements. The delay in reporting was noted to be from internal procedural errors. This is further discussed in Element 10.

This element has been found to have high compliance for clause 2.2.1 due to CCPs not yet being finalised and full compliance for clause 2.1.2.

4. Operational Procedures and Process Control

This element's focus is on having the correct operational procedures in place for a range of management issues including equipment capability and maintenance and materials and chemicals management.

Operational procedures: Hunter Water and Veolia procedures (as work instructions, SOPs etc) can be accessed through Hunter Water's 'Reservoir' Intranet workspace and Veolia's 'OnTap' Intranet workspace. Screen shots of procedures available from Hunter Water's intranet[76], and an example work instruction for working in potable water mains and fittings has been provided as evidence.[77] Operating procedures required for treatment processes and activities are documented in WTP Operating Manuals, with Gresford WTP Operating manual being provided as evidence.[78] CCPs are documented in the HACCP Limit Tables[79] and the HACCP response plan.[80]

A reservoir inspection report (dated April 2017 and signed 5 May 2017 for Elermore Vale Reservoir) was sighted that was not adequately followed or completed. The inspection form includes a requirement for checking the roof. This part of the form was ticked as having been completed, however we were advised during the audit interview that there is no ladder access to the roof and for the inspection to occur a ladder must be brought to site which did not occur in this instance. The tick relating to the roof having been checked is therefore incorrect. A condition assessment (after the audit date scope) revealed among other things:

> ***Water Quality*** *– This assessment found that the bird meshing between the walkway plates and roofing has failed in many locations. Because of this the tank is no longer vermin proof.*

[75] HWC Statement of Compliance 2016-17.pdf
[76] 2.1 EL4 A4.1.2 HW2015-1449 1 5.024 Presentation - Screenshot Asset Operation Intranet Page.jpg; 2.1 EL4 A4.1.2 HW2015-1449 1 5.026 Presentation - Screenshot Lab Contract Intranet Page.jpg; 2.1 EL4 A4.1.2 HW2015-1449 1 5.027 Presentation - Screenshot Treatment Operations Contract Intranet Page.jpg; 2.1 EL4 A4.2.2 HW2015-1449 1 5.047 Presentation - Screenshot Asset Operation - WQ Management and Exceptions Intranet Page.jpg
[77] 2.1 EL4 A4.1.2 HW2013-421 6.096 Work Instruction - 001 - Working on Potable Water Mains and Fittings
[78] Procedure - Gresford WTP Operating Manual – Veolia.pdf
[79] 2.1 EL2 A4.1.1 HW2014-778 15 2.007 Gresford WTP - HACCP Limit Table
[80] HW2014-778 15 2.001 Plan - Veolia HACCP Response - 29.01.2017.pdf

This finding reveals several shortcomings:

- Lack of integrity may result in an exposure pathway for vermin faecal contamination
- Integrity breach was left for a number of months increasing the probability of vermin access
- Form was falsely filled in, resulting in integrity breach not being picked up for a longer period of time.

Operational monitoring: Operational monitoring protocols for key performance parameters are documented in the Drinking Water Quality Monitoring Plan and HACCP Limit Tables.[81] Operational monitoring data for Gresford WTP was provided as evidence.[82] CCPs are monitored and controlled using SCADA, however not all SCADA system limits have been updated. Hunter Water noted that the Treatment Operations Contract Practice Note PN111 and critical limit alarm in SCADA are being updated in the 2017-18 financial year. Raw water sampling parameters, location and frequencies are included in the Drinking Water Quality Monitoring Plan.[83] Evidence of raw water quality data for the Paterson and Allyn River and notification to NSW health of blue-green algae samples was provided as evidence.[84]

Corrective action: Automated alarms and process shutdown control logic is used at the WTPs and distribution system chlorinators. As noted above, critical limit alarms in SCADA are being updated in the 2017-18 financial year. Hunter Water noted that procedures for managing excursions in operational parameters and exception reporting are documented in Hunter Water's Asset Operation Framework Intranet Page.[85]

Veolia CCP response protocols are included in the HACCP response plan.[86] The plan specifies notification protocols for CCP breaches and COP breaches, including timeframes in which breaches must be reported to Hunter Water. Veolia provides a monthly report to Hunter Water that documents water treatment performance and limit exceedances. A report for May 2017 was provided as evidence.[87]

A summary of water quality exceptions is provided to NSW Health on a quarterly basis, a report for the period April to June 2017 was provided as evidence.[88] Further information is detailed in Element 6 on incidents and emergencies.

Equipment capability and maintenance: Evidence to support how Hunter Water manages its assets and planned maintenance is provided under clause 4.1 and therefore not repeated here. However evidence was examined for how maintenance and calibration activities are considered during the risk assessment process. Gresford WTP HACCP Workshop Outcomes report details maintenance and calibration activities, with improvement items detailed in the improvement actions section, including improvements to the annual reservoir maintenance procedure. [89] An example calibration worksheet was also provided for Gresford WTP as part of the water quality monitoring spreadsheet.[90] Evidence was also provided of calibration certification for the Grahamstown WTP filter gallery turbidity meter upgrade.[91]

---

[81] 2.1 EL5 A5.1.1 HW2006-2906 2 6.006 Water Quality Monitoring Plan.doc, 2.1 EL4 A4.1.1 HW2014-778 15 2.007 Gresford WTP HACCP Limit Table
[82] 2.1 EL4 A4.4.1 HW2014-1579 2.003 Data - Gresford WTP.xlsb
[83] 2.1 EL4 A4.2.1 HW2006-2906 2 6.006 Water Quality Monitoring Plan.pdf
[84] HW2015-144919.048 Email to NSW Health Notification and Update - Elevated Cylindrospermopsis 21st March.pdf
[85] 2.1 EL4 A4.3.1 HW2015-1449 1 5.047 Presentation - Screenshot Asset Operation - WQ Management and Exceptions Intranet Page.jpg
[86] HW2014-778 15 2.001 Plan - Veolia HACCP Response - 29.01.2017.pdf
[87] E10 – Monthly Veolia contract report.pdf
[88] 2.1 EL4 A4.3.1 HW2010-1986 8.023 Procedure - Water Quality Exception Reporting - Current Version.docx
[89] 2.1 EL4 A4.4.1 HW2015-1365 18.011 Report - Gresford WTP Risk Assessment Summary Report
[90] 2.1 EL4 A4.4.1 HW2014-1579 2.003 Data - Gresford WTP
[91] 20161024 Calibration Certificates Filters 1-9.pdf; 20161024 Calibration Certificates Filters 10-16.pdf

Materials and chemicals: Hunter Water requires that all components used in the water and sewer networks (including within the drinking water catchments) be approved products and comply with AS/NZS 4020. Evidence was provided of approved Products and Manufacturers Registers available on the Hunter Water website.[92] Veolia work instructions were provided as evidence for the ordering, testing and delivery of hydrated lime and liquid polymer.[93] For chemicals supplied to the water distribution network Hunter Water has a contract which includes a technical specification outlining quality requirements of the product.[94] A procedure was provided for calcium hypochlorite tablet evaluation for reservoir dosing.[95]

Issues associated with procedures and SCADA were noted as a result of the Hunter Water self-reported non-compliance for the Four Mile Creek chlorination CCP and are captured under clause 2.1.1 of this element. Refer to Table 2-1 for further details.

Further information on this element is included as part of the outstanding recommendation 2013/14-02,03,04,06,13.

This element is considered high compliance for clause 2.1.1 and adequate for 2.1.2.

5 Verification of Drinking Water Quality

This element covers how verification monitoring of the system is undertaken including assessment of customer satisfaction, short-term evaluation of results and how corrective actions are taken in response to findings.

Drinking water quality monitoring: . Hunter Water's Drinking Water Quality Monitoring Plan documents key water quality characteristics that require monitoring, sampling locations and frequencies.[96] Sampling frequency is determined based on the population served. Annual performance assessment are based on water quality zones that are based on the areas supplied by Water Treatment Plants. Methods for assessing compliance are detailed in the Drinking Water Quality Monitoring Plan. Hunter Water ensures reliability of data through use of ALS, an external NATA accredited laboratory. Hunter Water currently undertakes regular audits of ALS's laboratory sampling and testing procedures, with an audit register provided as evidence.[97] Verification monitoring data in the distribution was provided for Gresford WTP.[98]

Consumer satisfaction: Hunter Water manages customer complaints as detailed in the customer complaints handling guidelines.[99] Complaint records are recorded in Hunter Water's Assets Operations Maintenance System (AOMS). Evidence was sighted for a complaint logged in AOMS for a dirty water quality event in December 2016.[100] A service fault maps procedure has been setup that links to different guidelines dependent on the nature of the complaint. Procedures relating to water quality were provided for 'air/white' (where the customer describes the water as white, milky, cloudy or spitting from all taps including the tap closest to the main) and for chlorine complaints.[101]

Short-term evaluation of results: Section 5.3 of Hunter Water's DWQMS covers short-term evaluation of results. Customer water quality complaint data dashboards were sighted during the audit interviews, Hunter Water advised that these are monitored and can trigger further

[92] 2.1 EL4 A4.5.1 HW2015-1449 1 5.061 Presentation - Screenshot Approved Produces and Manufacturers Internet Page.jpg
[93] 2.1 EL4 A4.5.2 HW2015-1449 1 9.029 WI-HW-20-7841-1 Lime - Ordering, Delivery, Testing.docx & 2.1 EL4 A4.5.2 HW2015-1449 1 9.028 WI-HW-20-7842-1 Liquid Polymer - Ordering and Delivery.docx
[94] 2.1 EL4 A4.5.1 HW2006-2247 34 11.001 Agreement - Contract for Supply and Delivery of Bulk Chemicals - CS0525 IXOM.pdf
[95] 2.1 EL4 A4.5.2 HW2012-1337 14 2.001 Procedure - Hypochlorite Tablet Validation.docx
[96] 2.1 EL5 A5.1.1 HW2006-2906 2 6.006 Water Quality Monitoring Plan.doc
[97] 2.1 EL5 A5.1.3 - Register - ALS Lab Contract Audit Inspection Register.xls
[98] 2.1 EL5 A5.3.1 HW2014-1579 2.003 Data - Gresford WTP.xls
[99] 2.1 EL5 A5.4.1 HW2013-1079.023 Customer Complaints Handling Guidelines.doc
[100] AOMS 503261.jpg
[101] 2.1 EL5 A5.2.1 HW2008-235 6.016 Guideline - Water Quality - Air White.doc; 2.1 EL5 A5.2.1 HW2008-235 6.017 Guideline - Water Quality – Chlorine.doc, 2.1 EL5 A5.2.1 HW2008-235 7.001 Service Fault Map.df

investigation or operational response. Hunter Water noted that water quality results at WTPs are recorded and reported regularly in the SCADA system, operator's daily log and in the Water Quality Database, with evidence provided for Gresford WTP.[102]

Water quality committee meetings are held monthly including review of water quality results and exception data. Evidence was provided of meetings from the June 2017 water quality committee meeting minutes.[103] A summary of the information is reported on a monthly basis to the board and water quality committee meetings. A quarterly exception report is provided to NSW Health for both drinking water and recycled water exceptions. Evidence of a report for the April to June quarter was provided as evidence.[104]

Corrective action: The Hunter Water Procedure for Water Quality Exception Reporting details how microbial water quality non-compliances are managed for verification monitoring samples within the distribution system. [105] A procedure for notification to NSW Health outlines the steps to notify NSW Health of adverse water quality events as agreed under the Memorandum of Understanding between Hunter Water and NSW Health.[106] It is noted that this document has a date of next review to be September 2016. It is recommended that this document be reviewed. An email notification to NSW Health was sighted of an *E. coli* sample at Martin's Creek reservoir in December 2016.[107] Further discussions on incidents and emergencies are covered under Element 6.

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

6 Management of Incidents and Emergencies

This element covers setting out what constitutes an incident for the organisation and having appropriate communication and response protocols in place to deal with any incidents that may arise – including learnings from the incident to avoid it happening again.

Communication: Communication protocols are defined in Hunter Water's Emergency Management Plan[108] and the specific response to water quality incidents in separate procedures.[109] We note that the document - 2.1 EL6 A6.1.1 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC – had as its next review September 2016. Hunter Water confirmed the document was current for the audit date scope. Media and communications management is dealt with through a range of methods at Hunter Water including the website, social media, rangers in the catchment and the Community Consultative Forum. Some of this information has already been covered in the commentary under Element 1. We were able to confirm communication on water quality incidents, issues and general water supply business as stated by Hunter Water.[110] An Emergency Response Communications Plan[111] is also in existence. However, we

[102] 2.1 EL5 A5.3.1 HW2014-1579 2.003 Data - Gresford WTP.xls
[103] 2.1 EL2 A2.1.1 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.docx
[104] 2.1 EL10 A10.2.2 HW2006-1448 41 7.010 Report - Quarterly to NSW Health - DW and RW Quality Exceptions April to June 2017.doc
[105] 2.1 EL5 A5.4.2 HW2010-1986 8.023 Procedure - Water Quality Exception Reporting - Current Version.docx
[106] 2.1 EL5 A5.4.2 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.docx
[107] 2.1 EL5 A5.3.2 HW2006-1448519.002 Email - Resamples at Martins Creek No 1 Reservoir.msg
[108] 2.1 EL6 A6.1.1 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf (Version 6, September 2016).
[109] 2.1 EL6 A6.1.1 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC (Version 1); 2.1 EL6 A6.1.1 HW2010-1986 8.023 Procedure for water quality exceptions.DOCX (Hunter Water confirmed that this document was current for the audit date scope although the date was not on the document itself).
[110] https://twitter.com/HunterWater/status/844712948337721344 (bottled water supplied during an outage, 22/03/2017); https://www.hunterwater.com.au/Water-and-Sewer/Water-Supply/Water-Quality/PFAS.aspx (notes on how Hunter Water is managing the PFAS issue); https://twitter.com/hunterwater?lang=en (Twitter feed).
[111] 2.1 EL6 A6.1.1 HW2011-662 14 5.002 Emergency Response Communications Plan.DOCX (Version 1, August 2016).

note that while this document was not reviewed according to its scheduled review frequency, it had still been current for the audit date scope.[112]

Incident and emergency response protocols: Hunter Water uses the relevant emergency management procedures and documentation to define incidents and emergencies e.g. section 4 of the Corporate Emergency Plan[113] covers incident category definitions with public health (water quality)[114] specifically covered in section 5. Documentation in use by Veolia was also reviewed as evidence.[115] Categories of incident are defined and include water quality. Veolia has also developed specific emergency management processes for water treatment plants.

Both Hunter Water's and Veolia's emergency and incident documentation cover debrief of incidents to ensure that learnings are identified and applied if required. Procedures are in place for informing NSW Health of incidents with potential public health impacts (see above). No procedures had been revised as a result of debriefs and therefore we could not test this part of the Framework. However, we note that the reporting non-compliance for the Four Mile Creek incident (discussed further in Element 10), did not trigger a review of the emergency and incident procedures as one of the remedial actions.

Hunter Water states that it undertakes a simulated emergency management exercise around every two years. Evidence was sighted to confirm that a first aid incident scenario session[116] was conducted within the audit date scope, which provides evidence that the process occurs in practice (albeit not for a water quality incident). In addition, Hunter Water undertakes small and more regular desktop discussions on incidents, including as part of the Water Quality Committee[117] responsibilities.

Integrum is used to capture non-conformances, including incidents, and this system was viewed as part of auditing clause 7.1. While use of Integrum was generally found compliant for drinking water, some shortcomings were noted in relation to the reporting of the chlorinator CCP exceedances. There is a process in place for reporting a CCP breach, but it was not implemented in the time required on four occasions. While Hunter Water has updated SCADA and added an automatic email notification to the Water Network Operation team on critical limit exceedance, it is not clear if a wider review of the incident management procedures was undertaken as per Framework requirements.[118]

A recommendation has been made to address this shortcoming.

Further information on this element is included as part of the outstanding Recommendation 2015/16-03.

7 Employee Awareness and Training

This element covers employee awareness, involvement and training for all involved in the water supply delivery chain.

[112] We were provided with a version post the audit interviews which shows that the document had been reviewed, with no changes required, November 2017 (Emergency Response Communications Plan.DOCX November 2017).
[113] 2.1 EL6 A6.1.1 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf, p14.
[114] 2.1 EL6 A6.1.1 HW2007-900 27 1.013 Corporate Emergency Management Plan.pdf, p15.
[115] 2.1 EL6 A6.2.1 HW2015-1449 1 9.015 PL-ANZ-9-382-3 Crisis Management Plan.PDF (April 2017; overarching approach to crisis management); 2.1 EL6 A6.2.1 HW2015-1449 1 9.016 PR-ANZ-9-456-4 Incident Reporting and Recording.PDF (30/05/2017); 2.1 EL6 A6.2.1 HW2015-1449 1 9.017 PR-ANZ-9-7314-5 Incident Investigation.PDF (08/07/2016).
[116] 2.1 EL6 A6.2.2 HW2015-1449 1 9.036 Emergency Management Training Material.pdf (March 2017); 2.1 EL6 A6.2.2 HW2015-1449 1 9.037 Emergency Management Training Example Attendance Sheet.pdf (09/05/2017).
[117] E.g. "*Verify that effective corrective action is undertaken in response to water quality variations and exceptions*" HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.pdf (4/12/16).
[118] Element 6, component 2, action 3 (A 6.2.3): Investigate any incidents or emergencies and revise protocols as necessary.

Employee awareness and involvement: All staff are inducted through the Corporate Induction Programme, which includes a requirement to be aware of all relevant corporate policies including the drinking water quality policy. Induction records[119] were requested and provided as evidence of implementation.

The policy is available on the Hunter Water website[120] and on the intranet via the DWQMS portal. See Element 1 for more information on the visibility of the policy.

All Hunter Water staff and contractors are required to complete the Drinking Water Quality Training and Awareness Program. Records of training evidence were provided and training had occurred within the audit date scope. Evidence of the e-learning program[121] for drinking water quality, including assessment questions, was provided and is adequate. Evidence to show updating[122] of the package was provided and updates confirmed.

DWQ compliance training evidence[123] was provided from Veolia including a record[124] of attendance.

Employee training: Hunter Water states that it includes drinking water quality responsibilities and required skills and competencies in position descriptions (PDs). See Element 1 for more information on PDs.

Staff are required to undertake formal and on the job training including Certificate III Water Operations for senior treatment operations staff, fluoride competency, water quality sampling and analysis requirements for laboratory staff. Several certificates were requested as evidence of implementation. A Fluoride 'ticket' was requested and received for a treatment contractor worker.[125] Sampling personnel training information was also requested and provided.[126]

Evidence was provided of training scheduled[127] for Certificate III in Water Operations. Although the evidence was for 2014, the evidence met the audit date scope requirements as Certificate III does not require refreshers or requalification.

Hunter Water provided a matrix[128] of competencies and other skill requirement records. Training refresher cycles were also noted where appropriate.

A training matrix was provided from Veolia, which shows the relevant requirements for each position. Certificate II and III in Water Operations as well as CCP and SOP training is documented for the relevant positions.[129] System operations competencies were supplied from Hunter Water. The information shows the requirement for specific training competencies[130] including incident reporting requirements, in addition to the general water quality awareness training requirements noted

---

[119] Hunter Water Training Register - Dec 2016.xlsm.

[120] https://www.hunterwater.com.au/Resources/Documents/Policies/Water/Drinking-Water-Quality-Policy.pdf, checked 18/10/2017.

[121] 2.1 EL1 A1.2.2 HW2015-1449 1 9.040 Drinking Water Quality Awareness Training Material.pptx.

[122] HW2015-1449 1 9.055 Edmore Material - Change Request.docx (noting that the date for the change was confirmed in an email from the training provider as May 2017 HW2015-1449 1 9.056 Re Drinking Water Quality Awareness Module.msg).

[123] 2.1 EL1 A1.2.2 HW2015-1449 1 9.012 DWQ Compliance Training.PDF (08/09/2016).

[124] 2.1 EL1 A1.2.2 HW2015-1449 1 9.013 DWQ Compliance Training Example Attendance Sheet.PDF 08/08/2016).

[125] Item 7 Fluoride Ticket – Veolia Staff.pdf (4/7/96).

[126] HW2015-1449 1 9.051 Sampling officer Training Record example.pdf (25/10/16); HW2015-1449 1 9.052 Sampling technique retraining example.pdf (8/3/17).

[127] 2.1 EL7 A7.2.2 HW2015-1449 1 5.005 Email - FW Proposed Schedule for Cert III Water Operations Training.MSG (we also note that the package NWP30107 that was used for training in 2014 was current and is still current – there having been no revisions since this time https://training.gov.au/Training/Details/NWP30107#).

[128] Hunter Water Training Register - Dec 2016.xlsm.

[129] 2.1 EL7 A7.2.2 HW2015-1449 1 9.044 Veolia Training Matrix.pdf (undated – clarification received from December 2016 Training Matrix - December 2016.xlsx).

[130] 2.1 EL7 A7.2.2 HW2015-1449 1 5.018 Data - System Ops_Competency Requirements.XLS (undated – Hunter Water noted that the document was current during the audit period, but no document control information was available to confirm the date).

above. High quality evidence was provided to show programming of training, allocation of resources and support for training through appropriate personnel.[131] Evidence of drinking water quality awareness was provided and confirmed.

Training issues noted with the Four Mile Creek self-reported CCP reporting breach are captured in Table 2-1 (Section 2).

8 Community Involvement and Awareness

This element covers understanding the community's water quality needs and perceptions including having effective two-way communication programs in place.

Community consultation: Hunter Water has a dedicated community and stakeholder team. Several pieces of evidence were provided to demonstrate how the process for assessing effective community involvement had been translated into outcomes. An issue of currency for this audit period is that of PFAS/PFOS/PFOA contamination in groundwater sources in Hunter Water's area of operations. Hunter Water provided information[132] on how it had addressed this issue from a communication perspective. Consultation is undertaken via the Community Consultative Forum, three times a year. Further information was reviewed under clause 7.1.

Communication: Hunter Water is in the process of formalising stakeholder and community engagement in a Stakeholder Engagement Standard and Procedure. In place for the audit date scope is the 2O17+3 STRATEGY, which Hunter Water states as being the foundation document for embedding customers and stakeholder engagement. We confirmed this as being the case with customer and stakeholder initiatives[133] integrated throughout the document. Hunter Water has a strong social media presence which it uses as part of its consultation approach.[134]

9 Research and Development

This element covers the requirement to periodically investigate the water supply system through targeted studies involving where necessary, validation and re-validation of processes to ensure that they are still providing water that is fit for purpose at that step in the supply chain. Design of equipment is also covered to ensure that the design meets appropriate industry codes and standards, produces water that is fit for purpose and does not provide a source of risk to the water production process.

Investigative studies and research monitoring: Hunter Water manages investigative studies and research monitoring through its 4 year research and development plan and project register. [135] Hunter Water has active research and development partnerships with Veolia, Water Research Australia, Water Services Association of Australia and Water Quality Research Australia, the Australian Research Council and a number of Australian universities.[136] Letters of commitment from

[131] HW2015-1449 1 9.054 Email - 2016-2017 - Quality Training Report.pdf (2016-2017); HW2015-1449 1 9.057 Position Description HR Coordinator.doc; HW2015-1449 1 9.058 Learning and Development Advisor.doc; HW2015-1449 1 9.060 Position Description Senior HR Business Partner Learning and Development.docx; HW2015-1449 1 9.062 Training Budget 2016-2017.xlsm; HW2015-1449 1 9.063 WQ Awareness Invoice 2of2.pdf (22/3/17); HW2015-1449 1 9.064 WQ Awareness Invoice 1of2.pdf (6/3/17).

[132] 2.1 EL8 A8.1.2 HW2015-1449 1 9.041 PFAS Communication Strategy.doc (November 2016); 2.1 EL8 C8.1.1 HW2017-480 2 12.002 Media Release Hunter Water adopts new PFAS Guidelines.pdf (5/4/17).

[133] 2.1 EL8 A8.1.2 HW2015-1055 7.002 Guideline - 2017+3 Strategy.PDF (Customer, Consumer and Community Expectations is one of the strategic drivers (p6)).

[134] 2.1 EL8 A8.1.2 HW2015-1449 1 9.018 Article - Twitter Page 2of2.PNG; 2.1 EL8 A8.1.2 HW2015-1449 1.010 Article - Twitter Page 1of2.PNG – Hunter Water's Twitter feed was also checked by us for periods within the audit date scope and we confirmed Tweets relating to drinking water and water outages.

[135] 2.1 EL9 A9.1.1 HW2009-1367 19.008 2013-2017 R&D Plan.doc & 2.1 EL9 A9.1.1 HW2009-1367.030 File Note - RD Projects Register 2009-2017.xls

[136] 2.1 EL9 A9.1.1 HW2009-1367 25.011 Memorandum of Understanding - University of Newcastle and HWC.pdf

Water Research Australia for two research projects were provided as evidence of current investigative studies being undertaken.[137]

Veolia provided evidence of a program that encourages embedded innovation and improved efficiencies, with staff raising innovative ideas and improvement in the Innoveo portal, with prizes given each quarter for the best ideas. Section 15 of Veolia's monthly report to Hunter Water documents these and other areas of innovation.[138] Evidence was also provided of investigations undertaken by Veolia at Dungog WTP on the suitability of using alternative coagulants.[139]

An Innovation Committee has been established, though it was noted that this committee did not meet during the audit period.

Validation of processes: The performance of WTPs is reported monthly by Veolia to Hunter Water. Performance is also reviewed by the Water Quality Committee on a monthly basis.[140] Hunter Water provided a range of evidence to support implementation in this area including revised CCP critical limit for pH[141] and a Disinfection Optimisation Strategy to improve the persistence of chlorine residual for effective disinfection in the distribution system. Evidence was provided of improved free chlorine residual performance and a project update presentation.[142]

Validation of preventive measures such as WTP processes is undertaken to ensure hazards identified from risk assessments are being controlled effectively. Grahamstown WTP filter gallery turbidity meter upgrade project was closed out during the audit period. Evidence was provided for calibration certification of the filters and project close out checklists.[143]

Design of equipment: Hunter Water's design validation process is outlined in the Design Validation Guideline document, where design validation is defined as ensuring that the "… *resulting asset is capable of meeting the requirements for the specified application or intended use, where known*".[144] Hunter Water uses a variety of asset design standards (guidelines, methodologies etc.) with evidence provided of these standards published on the Hunter Water intranet and website.[145]

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

10 Documentation and Reporting

This element covers the management of documentation and records and the requirement for internal and external reporting on water quality outcomes.

Management of documentation and records: All aspects of drinking water quality management are documented within Hunter Water's Drinking Water Quality Management System and for the contractor, in the Drinking Water Quality Management Plan.[146] Hunter Water further documents aspects of drinking water quality management within its Annual Report to IPART. In our review of clause 7.1, we sighted evidence of the document management system and the relationship of quality management within the Integrated Management System. We were unable to test electronic records

[137] 2.1 EL9 A9.1.1 HW2009-1367 32.014- In Vitro Bioassays as Assessments of Toxicity - R and D Project.pdf; 2.1 EL9 A9.1.2 HW2009-1367 11 10 - Sanitary Survey and Operational Monitoring Guidance - R and D project.pdf
[138] Item 9 Monthly Contract Report – Innovations.pdf
[139] Item 8 Coagulant research - Dungog WTP.pdf
[140] HW2006-1417 28 5.012 Minutes - April 2017 Water Quality Committee Meeting.pdf
[141] 2.1 EL9 A9.2.1 HW2016-1069 1 1.001 File note - revised critical limits for pH - for approval by MTO and MSO.docx
[142] 2.1 EL9 A9.1.2 HW2006-1417 28 7.007 Report - Network Operations Report – June 2017; 2.1 EL9 A9.1.2 HW2006-1448 53 1.005 Presentation - May 2017 DOS Update.pptx
[143] 20161024 Calibration Certificates Filters 1-9.pdf; 20161024 Calibration Certificates Filters 10-16.pdf; 20171019 Project Closeout Checklist.pdf
[144] 2.1 EL9 A9.3.1 HW2007-2744 5.082 Guideline - QG052 Design Validation Guideline (in Integrum) – CURRENT.docx
[145] 2.1 EL9 A9.3.1 HW2015-1449 1 5.060 Presentation - Screenshot Hunter Water Design Manual Page.jpg; https://www.hunterwater.com.au/About-Us/Publications/Standards/
[146] 2.1.1 HW2015-1303 9.001 Report - Hunter Water Drinking Water Quality Management System.pdf; 2.1.1 HW2015-1449 1 9.021 Drinking Water Quality Management Plan – Veolia.pdf.

management at the Gresford WTP because of its size but were able to confirm that current documents were in use through review of the hard copy documentation at the site (see Appendix A for more information). TRIM HP Records Management is used as the main repository for records and Integrum for document control. On Tap is used by the treatment contractor. When requested by the auditors, documents and records could be found and were provided by both Hunter Water and the treatment contractor. Hunter Water has a corporate standard for document control which is discussed in detail under clause 7.1.

We note that for the most part, documents were current and were reviewed according to their review cycles and as per the corporate standard.

A handful of documents were the exception to this finding these being:

- Enterprise Risk Management Framework (currency issues further discussed under clause 7.1):[147] This document was past its review cycle however, was current for the audit date scope because of planned and significant changes that were required. It is anticipated that this document will be finalised and implemented in 2017-18.
- Corporate Document Control Standard:[148] (currency issues further discussed under clause 7.1): This document was past its review cycle however, was current for the audit date scope because of planned and significant changes that were required. It is anticipated that this document will be finalised and implemented in 2017-18.
- Emergency Response Communications Plan.DOCX (Version 1, August 2016): We were provided with a version post the audit interviews which shows that the document had been reviewed, with no changes required, November 2017 (Emergency Response Communications Plan.DOCX November 2017.
- 2.1 EL6 A6.1.1 HW2006-2906 4 6.023 procedure to notify NSW Health of events with potential public health impact.DOC – this document had as its next review September 2016. We checked whether the document was still current for the audit date scope and received confirmation that it was.

Reporting: Hunter Water uses a corporate compliance calendar and register for tracking of reporting and compliance issues and this is discussed in further detail in Element 1. Various water quality reporting mechanisms are in place and this evidence has been tested under other elements including viewing of Water Quality Committee meeting minutes, minutes and emails showing liaison with and reporting to NSW Health, reporting to IPART, reporting through and on the Integrated Management System (clause 7.1). Hunter Water is required to report according to its Reporting Manual as part of its Operating Licence requirements. We confirmed that reporting occurs as per requirements including a letter from Hunter Water to IPART noting significant changes to the Drinking Water Quality Management System (see clause 2.1.3 and 2.1.4). We note, however, that within the audit date scope, there was an incident of non-reporting in relation to a CCP. There were four breaches of the rechlorination CCP at Four Mile Creek. The notification of the breach to NSW Health should have occurred immediately. These breaches occurred almost one year apart – two in July 2016 and two in June 2017. While NSW Health was later informed, the notifications did not occur as per the required timeframe. From a public health standpoint, the breach did not result in an impact on customers with no discernible impact on residual chlorine noted downstream of the rechlorinator. Hunter Water has undertaken several remedial actions in relation to the management of the breach including re-training of operators[149] and a review of SCADA controls and alarms. While

[147] 7.1.3 Enterprise Risk Management Framework.pdf (version 3, February 2013, next review 2015).
[148] 7.1.3 Standard - Corporate Document Control.docx (out of date but currently undergoing review).
[149] Completed 6_9_17 - Competency 4 Water Quality Management Observation Assess.docx; Completed 24_8_17 - Competency 4 Water Quality Management Observation Asess.docx; Completed 23_8_17 - Competency 4 Water Quality Management Observation Assess.docx; Completed 14_09_17 - Competency 4 Water Quality Management Observation Assess.docx.

training has occurred, it is not clear if the emergency and incident procedures have been reviewed as a result of the non-compliance.

11 Evaluation and Audit

This element covers the longer-term evaluation of results and system audit to allow for identification of longer term trends and system improvements as required.

Long-term evaluation of results: Hunter Water has formal processes in place for evaluation of results including through the Water Quality Committee (terms of reference and minutes reviewed earlier). Hunter Water notes that it had undertaken a detailed review of water quality trends for all source waters in 2012 for the previous 3 year period and that the 2012-2017 period report is currently being prepared. We were however, able to sight reviews of other trend information within the risk workshop briefing papers reviewed elsewhere (Element 2/3 and the previous drinking water quality recommendations). In its response to IPART for this audit, NSW Health noted issues with the long term management of distribution system disinfection residuals. We were able to sight evidence of distribution system residual reviews and results to date indicate that while a work in progress, maintaining distribution system residual levels is improving.[150]

Audit of drinking water quality management: We reviewed the overall approach to auditing under clause 7.1 and sighted information in relation to drinking water. Both Hunter Water and the treatment contractor have formal auditing procedures in place.[151] A formal audit schedule showing drinking water quality auditing requirements is in place.[152] However, there are currently no audits scheduled for the treatment contractor's drinking water treatment operations. We queried this apparent omission with Hunter Water, and received and accepted the following response:

> *"Auditing is undertaken under the contract, however the items in the [schedule] are not in the contract (and are included in Hunter Water's proposed internal audit program). There are no entries because the internal audit items shown in the [schedule] are proposed only and have not been formalised. Formalisation is required to refine the scope and timing of the audits. Entries are typically made against audit items upon formalisation."*

The treatment contractor is required to undergo an external independent audit as part of the contract conditions (see clause 7.1.3 for more information). An audit report was provided (for operations between July 2016 to July 2017) to demonstrate implementation of this requirement.

There were only two minor non-compliance findings, which posed no current risk to contractual obligations or public health.[153] Hunter Water also audits the laboratory contractor. Records confirm that the audit occurs in practice.[154] Results are communicated to the Water Quality Committee and through Integrated Management System reviews (see also clause 7.1.3).

12 Review and Continual Improvement

This element covers the need for oversight and review of the system from senior management, including the Board and the development of a formalised drinking water management improvement plan to document and plan for system improvements.

Review by senior executive: Review of system effectiveness is undertaken as part of the Integrated Management System review and this aspect was reviewed and confirmed under clause 7.1.3. The

[150] 2.1 EL11 A11.1.2 HW2006-1417 28 7.007 Report - Network Operations Report - June 2017.DOCX.
[151] 2.1 EL11 A11.2.1 HW2013-421 11.002 Procedure - Conduct Management System Internal Audit – CURRENT.DOCX (next review due June 2017); 2.1 EL11 A11.2.1 HW2015-1449 1 9.043 Procedure - PR-ANZ-1-475 Audit.pdf.
[152] 2.1 EL11 A11.2.1 HW2013-421 9.008 Register - 2015 - 2018 Internal Audit Schedule.XLSX.
[153] 2.1 EL11 A11.2.1 HW2014-778 15 9.018 Report - Audit of Veolia s DWQMS - Water Futures - 2017.pdf.
[154] 2.1 EL11 A11.2.1 HW2015-106 7 2.001 Register - ALS Lab Contract Audit Inspection Register.XLS; 2.1 EL11 A11.2.1 HW2015-1449 1 5.052 Report - Audit Records July 16.PDF (audit report for ALS audit 28/7/16).

treatment contractor has its own procedure for management review.[155] We sighted evidence to show that system reviews are undertaken at the Water Quality Committee meetings and that a standard agenda item is included for any changes to the Drinking Water Quality Management System as well as review of the Drinking Water Quality Improvement Plan (notes detailed earlier).[156]

Drinking water quality management improvement plan: Hunter Water maintains a Drinking Water Quality Management Improvement Plan which was demonstrated during the audit interviews. The plan clearly shows how actions have arisen (e.g. from risk assessments, investigations, operational licence audits), related area, who is responsible, timeframe etc.. The treatment contractor also has a requirement to undertake improvements to the system and to support Hunter Water's Drinking Water Quality Management System. Evidence was provided to support implementation of innovation investigations by the contractor.[157]

To test the overall process, we requested and were provided with information to show how Hunter Water and the treatment contractor had worked together to identify and remediate issues. We requested information associated with turbidity meters at Grahamstown WTP.[158] The records provided showed that the process commenced before the 2016-17 year and finished after that period. However, we accepted the evidence of an overall process and note that not all improvements are able to be implemented within the audit date scope period. The approach and records demonstrate a noteworthy effort, showing an effective partnership between the contractor and Hunter Water and implementation of improvement in practice.

[155] 2.1 EL12 A12.1.1 HW2015-1449 1 5.034 Procedure - PR-ANZ-1-476 Management Review Procedure.PDF (21/1/13).
[156] 2.1 EL11 A11.2.2 HW2006-1417 28 8.013 Minutes - July 2017 Water Quality Committee Meeting.DOCX (out of audit date scope but included discussion relating to in scope aspects).
[157] Item 8 Coagulant research - Dungog WTP.pdf; Item 9 Monthly Contract Report - Innovations.pdf.
[158] 20151125 Project Development Plan.pdf; 20151126 Turbidity Meter Trial.pdf; 20160219 RFP Scope of Work - Mechanical.pdf; 20160229 RFP Scope of Work - Electrical.pdf; 20160308 RFP Evaluations.pdf; 20160308 Variation.pdf; 20160411 Letter of Approval.pdf; 20160505 CapitalWorks_ValueAdded.pdf; 20160505 Project Charter.pdf; 20160603 SWMS - NCM.pdf; 20160608 PLC_SCADA Scope of Works.pdf; 20160705 Change request.pdf; 20160705 SWMS - JA Martin.pdf; 20160906 SWMS - JA Martin.pdf; 20161024 Calibration Certificates Filters 1-9.pdf; 20161024 Calibration Certificates Filters 10-16.pdf; 20161107 Commissioning - JA Martin.pdf; 20161116 Turbidity Meter Upgrade Training.pdf; 20161213 Project Document Transmittal.pdf; 20170629 Hunter Water post install inspection.pdf; 20171019 Project Closeout Checklist.pdf; 20171019 Transaction Summary.pdf; 20171020 Project Completion Notification.pdf.

Clause 2.1.3

Table B-5. Clause 2.1.3 compliance grade

Subclause	Requirement	Compliance grade
2.1.3	Hunter Water must notify IPART and NSW Health of any significant changes that it proposes to make to the Drinking Water Quality Management System in accordance with the Reporting Manual.	Full

Risk	Target for full compliance
Not having informed IPART and NSW Health of any significant changes proposed to the Drinking Water Quality Management System poses a risk of non-compliance with this licence clause.	Evidence to confirm that changes to the Drinking Water Quality Management System have been assessed for significance and that IPART and NSW Health have been notified.

Evidence sighted

- Interviews with Hunter Water and Veolia water quality teams.
- 2.1.3 HW2014-778 15 2.007 Gresford WTP - HACCP Limit Table.PDF
- 2.1.3 HW2015-1449 1 9.007 Article - Drinking Water Quality Improvement Plan Actions.pdf
- 2.1.3 HW2016-1069 1 1.001 File note - revised critical limits for pH.pdf
- 2.1.3 HW2016-1069 3.001 Email - NSW Health progress on Hunter Water CCPs.MSG
- 2.1 EL2 A2.1.1 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.DOC
- 2.1 EL2 A2.1.1 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.DOCX
- REPORT ON SIGNIFICANT CHANGES TO OPERATING LICENCE - HWC - Jim Bentley.pdf
- STATUS OF RECOMMENDATIONS-2015-16 OPERATIONAL AUDIT - HWC - Jim Bentley.pdf

Summary of reason for grade

We were able to confirm that Hunter Water had informed both NSW Health and IPART of the proposed pH critical limit changes to the Drinking Water Quality Management System as required by this clause. We note that while formal evidence was provided for discussion of proposed changes with NSW Health, we were only able to confirm notification of proposed changes through discussion with IPART. IPART confirmed that it had been aware of discussion between NSW Health and Hunter Water prior to the change occurring. We confirmed that Hunter Water formally notified IPART of the change in March 2017. As such, we are satisfied that this clause achieves full compliance with an opportunity to improve formality of notification to IPART of proposed changes.

Discussion and notes

Hunter Water notes that changes to the Drinking Water Quality Management System (DWQMS) are reviewed at its monthly Water Quality Committee meetings and that the significance of changes is discussed at those meetings. We reviewed the Water Quality Committee terms of reference. While those terms do not state specifically that significance of change is discussed, we note that an overarching purpose is to:

> *"Oversee and review Hunter Water's performance against the operating licence requirement to maintain a drinking water quality management system consistent with the Australian Drinking Water Guidelines' Framework for Management of Drinking Water Quality."*[159]

[159] 2.1 EL2 A2.1.1 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.DOC, Bullet point 1, p1.

We consider this overarching statement adequate for capturing the requirements of this clause. The Treatment Operations Contractor is also a member of the committee and is a key stakeholder for informing the need for change or providing input to significance of the change.

We confirmed that significant issues of change for certain items are discussed at the NSW Health and Hunter Water liaison meetings.[160] As an observation, there is no explicit agenda item relating specifically to any significant changes to the Drinking Water Quality Management System per se. This fact is not considered material to compliance with clause 2.1.3 although clarity could be improved.

An internal file note[161] was provided by Hunter Water to show documented evidence of discussion and resolution on changes to pH CCP critical limits at all water treatment plants. A letter was provided as evidence to show that Hunter Water had requested 'endorsement'[162] from NSW Health of proposed changes to the pH CCP critical limit (as part of the disinfection process).[163] The letter states that Hunter Water considers changes to critical limits to be significant and the auditors agree with this position and accept the letter as evidence. As a result of the NSW Health review of the proposed changes, a suite of actions to address the CCPs has been agreed and actions have been added to the Drinking Water Quality Improvement Plan. We confirmed that the Drinking Water Quality Improvement Plan contained actions relating to CCP changes and NSW Health feedback.[164] We also confirmed that NSW Health replied to an email from Hunter Water requesting NSW Health's satisfaction with progress on the CCPs. NSW Health's response was that it is satisfied with progression thus far and is awaiting the opportunity to review outcomes from the CCP-related actions added to the Drinking Water Quality Improvement Plan.[165]

In relation to notifying IPART of proposed significant changes, we were unable to sight formal evidence of notification of proposed changes but we confirmed verbally[166] with IPART that it had been aware of the discussions with NSW Health (as detailed above) before the changes occurred. We did sight formal evidence from Hunter Water to IPART that the change to the pH critical limit had occurred.[167]

Recommendations

There are no recommendations for this clause but we note that CCP-related recommendations are ongoing and are addressed under Element 3 of clause 2.1.1/2 and the findings on existing recommendations within this report.

Opportunities for improvement

Clause 2.1.3 does not have an equivalent clause in the 2017-22 operating license. Therefore while opportunities for improvement were identified they have not been included in the audit report.

[160] 2.1 EL2 A2.1.1 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.DOCX e.g. significant changes to CCPs, amoeba monitoring.
[161] 2.1.3 HW2016-1069 1 1.001 File note - revised critical limits for pH.pdf (15/12/16).
[162] As an observation, NSW Health does not 'endorse', it expresses 'satisfaction'.
[163] 2.1.3 HW2015-1343 4.003 Letter - REQUEST FOR NSW HEALTH ENDORSMENT OF CCP CRITICAL LIMITS – 7 6 2016.PDF
[164] 2.1.3 HW2015-1449 1 9.007 Article - Drinking Water Quality Improvement Plan Actions.pdf (line items 190-194).
[165] 2.1.3 HW2016-1069 3.001 Email - NSW Health progress on Hunter Water CCPs.MSG (28/6/17).
[166] Telephone conversation between the auditor and Principal Analyst, IPART, 15/11/17, 12:29 pm.
[167] REPORT ON SIGNIFICANT CHANGES TO OPERATING LICENCE - HWC - Jim Bentley.pdf (31/3/17) and STATUS OF RECOMMENDATIONS-2015-16 OPERATIONAL AUDIT - HWC - Jim Bentley.pdf (31/3/17).

Clause 2.1.4

Table B-6. Clause 2.1.4 compliance grade

Subclause	Requirement	Compliance grade
2.1.4	Hunter Water must obtain NSW Health's approval for any significant changes proposed to be made to the Drinking Water Quality Management System before implementing or carrying out its activities in accordance with them.	Full

Risk	Target for full compliance
As the public health regulator for NSW, not obtaining approval from NSW Health may pose a risk of the Drinking Water Quality Management System change not being fit for purpose and therefore, present a risk to customer health.	Evidence to confirm that NSW Health has reviewed the change and is satisfied with the change.

Evidence sighted

See evidence for clause 2.1.3.

Summary of reason for grade

As noted under clause 2.1.3, Hunter Water sought and received NSW Health's satisfaction for the CCP critical limit changes and progress on finalising CCPs. These items represent significant changes to the Drinking Water Quality Management System. This clause is considered fully compliant.

Discussion and notes

See discussion and notes for clause 2.1.3.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

Clause 2.2 – Recycled Water – Water Quality

Clause 2.2.1

Table B-7. Clause 2.2.1 compliance grade

Subclause	Requirement	Compliance grade
2.2.1	Hunter Water must maintain a Management System that is consistent with: a) the Australian Guidelines for Water Recycling; or b) if NSW Health specifies any amendment or addition to the Australian Guidelines for Water Recycling that applies to Hunter Water, the Australian Guidelines for Water Recycling as amended or added to by NSW Health, (Recycled Water Quality Management System). [Note: It is generally expected that Hunter Water will develop a system consistent with the Australian Guidelines for Water Recycling, including the Recycled Water Quality Framework. However, where NSW Health considers it appropriate, the application of those Guidelines may be amended or added to, to take account of Hunter Water's circumstances and/ or Recycled Water Quality policy and practices within New South Wales.]	Adequate

Risk	Target for full compliance
Waterborne outbreaks from mismanagement of recycled water quality still occur in the developed world. Environmental impacts from mismanaged of recycled water may have cumulative impacts. 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

Evidence sighted

- 2.2.1 - Corporate Recycled Water Quality Management Plan - Current.DOCX
- 2.2.1 - Kurri Kurri Sampling Calendar.xlsx
- 2.2.1 - Kurri Kurri Sampling Guide sheet.docx
- 2.2.1 - Kurri Kurri WWTW Recycled Water Quality Management Plan.DOCX
- 2.2.1 - Kurri Kurri WWTW risk workshop update summary Sept 2017.DOCX
- 2.2.1 - Kurri Kurri WWTW RWQMP Veolia.docx
- 2.2.1 - Kurri Risk Workshop Worksheet V3.xlsm
- 2.2.1 - Kurri WWTW Risk Workshop Update Background Notes V1.DOCX
- 2.2.1 - Procedure - Recycled Water Quality Incident Response CURRENT.DOCX
- 2.2.1 - Recycled Water Improvement Plan.xlsx
- 2.2.1 - Recycled Water Policy.pdf
- 2.2.1 - Recycled Water Quality Monitoring Plan - CURRENT.DOCX
- 2.2.1 - Sample Schedule Kurri Kurri WWTW.pdf
- 2.2.1 - Veolia Incident and Emergency management manual.docx
- 2.2.1 - Veolia incident and emergency response procedure.docx
- 2.2.1 - Veolia Kurri Kurri WWTW operational manual.pdf
- 2.2.1 - Veolia Recycled Water Awarness Training Presentation.pptx
- 2.2.2 - Corporate Key risk indicator email.jpg
- 2.2.2 - Corporate Key risk indicator spreadsheet.jpg

- 2.2.2 - Corporate recycled water risk assessment.docx
- 2.2.2 - Daily CCP alarm report from SCADA.xls
- 2.2.2 - Kurri GC Signed Agreement Oct 2015.PDF
- 2.2.2 - Kurri Kurri SCADA change request.pdf
- 2.2.2 - Kurri Kurri WWTW Recycled Water Quality Management Plan.DOCX
- 2.2.2 - Kurri TAFE Executed Agreement Oct 16 - Jun 21.PDF
- 2.2.2 - Monthly Veolia contract report.PDF
- 2.2.2 - Recycled Water Improvement Plan.xlsx
- 2.2.2 - Recycled Water Operational Meeting.docx
- 2.2.2 - Recycled Water Quality Report 20170920.xlsx
- 2.2.2 - Report - Kurri GC Annual site inspection 9 May 2017.XLSX
- 2.2.2 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS
- 2.2.2 - Veolia Document Control and Access for Operators.docx
- 2.2.2 - Veolia Incident Register for Kurri Kurri WWTW.xlsx
- E1 - Compliance calendar.jpg
- E1 - Corporate Recycled Water Quality Management Plan - Current.docx
- E1 - Hunter Water IMS Matrices.XLSX
- E1 - Hunter Water Recycled Water Awareness Training.PPTX
- E1 - Kurri GC Signed Agreement Oct 2015.PDF
- E1 - Kurri Kurri WWTW Recycled Water Quality Management Plan.docx
- E1 - Kurri TAFE Executed Agreement Oct 16 - Jun 21.PDF
- E1 - Recycled Water Awareness Training register.xlsx
- E1 - Recycled Water Operational Meeting.docx
- E1 - Recycled Water Policy.pdf
- E1 - Report - Kurri GC Annual site inspection 9 May 2017.XLSX
- E1 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS
- E2 - Corporate Recycled Water Quality Management Plan - Current.docx
- E2 - Kurri Kurri WWTW Recycled Water Quality Management Plan.docx
- E2 - Kurri Kurri WWTW risk workshop update summary Sept 2017.DOCX
- E2 - Kurri Risk Workshop Worksheet V3.xlsm
- E2 - Kurri WWTW Risk Workshop Update Background Notes V1.DOCX
- E3 - Establishment and Review of Recycled Water CCPs CURRENT.DOCX
- E3 - Kurri Kurri WWTW CCP's SCADA.docx
- E3 - Kurri Kurri WWTW Recycled Water Quality Management Plan.docx
- E3 - Kurri Risk Workshop Worksheet V3.xlsm
- E4 - Corporate Recycled Water Quality Management Plan - Current.docx
- E4 - Hunter Water approved products website.jpg
- E4 - Kurri Kurri WWTW CCP's SCADA.docx
- E4 - Kurri Kurri WWTW Plant spreadsheet 27092017.xlsb
- E4 - Kurri Kurri WWTW Recycled Water Quality Management Plan.docx
- E4 - MN-HWW-20-7812 Kurri Kurri Operation Manual.pdf
- E4 - Recycled Water Asset Construction and Maintenance CURRENT.DOCX
- E4 - Recycled Water Quality Monitoring and Communication CURRENT.DOCX
- E4 - Recycled water workspace.jpg
- E4 - Veolia Alum ordering, delivery and testing.docx
- E4 - Veolia Document Control and Access for Operators.docx
- E4 - Veolia Ferrous ordering, delivery and testing.docx
- E4 - Veolia Kurri WWTW maintenance tasks.pdf
- E4 - Veolia Sodium Hydroxide ordering, delivery and testing.docx
- E4 - Veolia Sodium Hypochlorite ordering, delivery and testing.docx
- E5 - Kurri Golf Club Management Plan.pdf

- E5 - Kurri Tafe Management Plan.docx
- E5 - Procedure - Recycled Water Quality Incident Response CURRENT.DOCX
- E5 - Recycled Water Operational Meeting.docx
- E5 - Recycled Water Quality Monitoring and Communication CURRENT.DOCX
- E5 - Recycled Water Quality Monitoring Plan - CURRENT.DOCX
- E5 - Recycled Water Quality Report 20170920.xlsx
- E5 - Report - Kurri GC Annual site inspection 9 May 2017.XLSX
- E5 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS
- E5 - Sample Schedule Kurri Kurri WWTW.pdf
- E6 - Corporate Emergency Management plan September 2016.docx
- E6 - Course Information.pdf
- E6 - Form - Attendance Sheet - TEC011 - Resilience Training - Session 1 - 9 M....pdf
- E6 - Form - Attendance Sheet - TEC011 - Resilience Training - Session 2 - 9 M....pdf
- E6 - Kurri Golf Club notifications.png
- E6 - Kurri power outage Health notification.pdf
- E6 - Kurri Tafe notifications.png
- E6 - Kurri UV issue Health Notification.pdf
- E6 - Kurri UV weir issue Veolia report.pdf
- E6 - Procedure - Recycled Water Quality Incident Response CURRENT.DOCX
- E6 - Recycled Water Quality Incident Assessment Checklist.docx
- E6 - Veolia Incident and Emergency management manual.docx
- E6 - Veolia incident and emergency response procedure.docx
- E6 - Veolia mock scenario debrief.pdf
- E7 - Corporate Recycled Water Quality Management Plan - Current.docx
- E7 - Hunter Water IMS Matrices.XLSX
- E7 - Hunter Water Recycled Water Awareness Training.PPTX
- E7 - Kurri Kurri WWTW Recycled Water Quality Management Plan.docx
- E7 - Veolia Recycled Water Awareness Training.pptx
- E7 - Veolia Training Matrix.pdf
- E7 - Veolia training register.docx
- E8 - Kurri GC Signed Agreement Oct 2015.PDF
- E8 - Kurri Golf Club Audit findings Letter 16-17.docx
- E8 - Kurri Tafe Audit findings Letter 16-17.docx
- E8 - Kurri TAFE Executed Agreement Oct 16 - Jun 21.PDF
- E8 - Recycled Water Customers awarness presentation.pptx
- E8 - Recycled Water website information.jpg
- E8 - Report - Kurri GC Annual site inspection 9 May 2017.XLSX
- E8 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS
- E8 - Stakeholder Engagement Standard.docx
- E9 - Kurri Kurri WWTW Recycled Water Quality Management Plan.docx
- E9 - Report - Helminth controls for Hunter Waters recycled water schemes.DOCX
- E9 - WWTW Recycled Water Existing Schemes Validation Program - CURRENT.DOCX
- E10 - Compliance-and-Performance-report-2016-17.pdf
- E10 - Corporate Key risk indicator email.jpg
- E10 - Corporate Key risk indicator spreadsheet.jpg
- E10 - Corporate recycled water risk assessment.docx
- E10 - IMS Review Meeting Report.doc
- E10 - IMS Review Meeting Minutes.docx
- E10 - IMS Review Meeting Presentation.pptx
- E10 - Minutes - Hunter Water NSW Health Liaison Committee Meeting - 8 March 2017.DOCX
- E10 - Monthly Veolia contract report.PDF

- E10 - Procedure - Manage Document Control
- E10 - Procedure IMS Management Review Meeting.docx
- E10 - Recycled Water Quality Report 20170920.xlsx
- E10 - Recycled Water Reporting and Review Requirements (Internal and External) CURRENT.DOCX
- E10 - Recycled Water Trim Location.jpg
- E10 - Standard - Corporate Document Control – CURRENT
- E10 - TRIM Support intranet
- E10 - TRIM training
- E10 - Veolia Document Management Procedure
- E11 - Compliance calendar.jpg
- E11 - IMS Review Meeting Report.doc
- E11 - IMS Review Meeting Minutes.docx
- E11 - IMS Review Meeting Presentation.pptx
- E11 - Kurri WWTW Risk Workshop Update Background Notes V1.DOCX
- E11 - Procedure IMS Management Review Meeting.docx
- E11 - Working Paper - Annual review 2016-17.XLS
- E12 - IMS Review Meeting Report.doc
- E12 - IMS Review Meeting Minutes.docx
- E12 - IMS Review Meeting Presentation.pptx
- E12 - Procedure IMS Management Review Meeting.docx
- E12 - Recycled Water Improvement Plan.xlsx
- Rec 01 - 2014-15 - Karuah Helminth options study.jpg
- Rec 01 - 2014-15 - Report - Helminth controls for Hunter Waters recycled water schemes.DOCX
- Rec 02 - 2014-15 - Branxton WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Cessnock WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Clarence Town WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Dora Creek WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Dungog WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Edgeworth WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Karuah Helminth options study.jpg
- Rec 02 - 2014-15 - Karuah WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Kurri Kurri WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Morpeth WTW CCP's SCADA.docx
- Rec 02 - 2014-15 - Report - Helminth controls for Hunter Waters recycled water schemes.DOCX
- Rec 02 - 2014-15 - Report - Helminth controls for Hunter Waters recycled water schemes.DOCX.crdownload
- Rec 03 - 2013-14 - Branxton WWTW SCADA.docx
- Rec 03 - 2013-14 - Cessnock WWTW SCADA.docx
- Rec 03 - 2013-14 - Clarence Town WTW CCP's SCADA.docx
- Rec 03 - 2013-14 - Dora Creek WTW CCP's SCADA.docx
- Rec 03 - 2013-14 - Dungog WTW CCP's SCADA.docx
- Rec 03 - 2013-14 - Edgeworth WWTW SCADA.docx
- Rec 03 - 2013-14 - Karuah CCP's SCADA.docx
- Rec 03 - 2013-14 - Kurri Kurri Operation Manual.pdf
- Rec 03 - 2013-14 - Kurri Kurri RWQMP Veolia.docx
- Rec 03 - 2013-14 - Kurri Kurri WWTW CCP's SCADA.docx
- Rec 03 - 2013-14 - Kurri Kurri WWTW Recycled Water Quality Management Plan.DOCX
- Rec 03 - 2013-14 - Morpeth WWTW SCADA.docx
- Rec 03 - 2013-14 - NSW Health letter.pdf
- Rec 03 - 2013-14 - Recycled Water Operational Meeting.docx

- Rec 04 - 2015-16 - Karuah and Clarence Town farm management contract tender.docx
- Rec 04 - 2015-16 - Karuah Operation Manual.pdf
- Rec 04 - 2015-16 - Karuah Risk workshop update summary September 2017.DOCX
- Rec 04 - 2015-16 - Karuah Risk Workshop Worksheet V3.xlsm
- Rec 04 - 2015-16 - Karuah WWTW Recycled Water Quality Management Plan.DOCX
- Rec 04 - 2015-16 - KaruahWorksheet 27092017.xlsb
- Rec 04 - 2015-16 - Register - ER0106 - Environmental Commitments Tracking - CURRENT (1).XLSM
- Rec 04 - 2015-16 - Register - ER0106 - Environmental Commitments Tracking - CURRENT.XLSM
- Rec 04 - 2015-16 - Report - Karuah WWTW Risk Workshop Update Background Notes 2017.DOCX
- Rec 04 - 2015-16 - Veolia Karuah RWQMP.docx
- Rec 04 - 2015-16 - Veolia Karuah site farm management worksheets.pdf
- Rec 05 - 2015-16 - Plan - Recycled Water Gap Analysis (HW Operational Audit 2015-16) (1).xlsx
- Rec 05 - 2015-16 - Plan - Recycled Water Gap Analysis (HW Operational Audit 2015-16).xlsx
- Rec 14 - 2013-14 - Clarence Town Risk Workshop Worksheet V3.xlsmBranxton WWTW Risk Workshop Update Background Notes 2016 V2.DOCX
- Contact centre Competency Assessment Record.pdf
- Email to NSW Health - Recycled water risk assessment schedule.jpg
- HW2008-1592 20 22.001 - Corporate Recycled Water Quality Management Plan - Pre 30 June 17.docx
- Internal Quality Audit - Commitment to Responsible Use and Managt of RW Quality - El 1 - Jan 2017.DOCX
- Kurri_Kurri_WWTW_Recycled_Water_Quality_Management_Plan_June 2016.docx
- Morpeth WWTW Risk Workshop Update Background Notes 2017 V1.DOCX
- Recycled Water Visit Register MASTER.xls
- Recycled_Water_Report20160713.xlsx
- Report - Kurri Kurri risk workshop summary.DOC
- Report - Kurri Kurri WWTW risk assessment briefing paper.DOC
- TAFE Recycled Water Customer Management Plan DRAFT.docx
- Veolia
- Working Paper - Branxton Risk Assessment Post Workshop update 2016.XLSM
- Working Paper - Clarence Town Risk Workshop Worksheet 2017.XLSM
- Working Paper - Karuah Risk Workshop Worksheet 2017.XLSM
- Working Paper - Kurri Kurri WWTW risk assessment.XLSM
- Working Paper - Morpeth Risk Assessment Post Workshop update 2017.XLSM
- WWTW alarm list.pdf
- Audit Table additional information.xlsx
- Item 1 Corporate Mail - Re_ Cessnock WWTW Recycled Water Quality Management Plan - V12.pdf
- Item 10 Environmental Incident Report for UV Failure at Kurri 29 Nov 16.docx
- Item 2a Veolia SCADA Change Register.xlsm
- Item 2b HWC Register - SCADA change request 201711.xls
- Item 2c1 Corporate Mail - WWTW CCP and EPA Compliance Alarms.pdf
- Item 2c2 HWC CCP SCADA Alarm Report 110117.xls
- Item 3a Screenshot for Clarence Town Pooling PO GWA85683.docx
- Item 3b PO for Enviroculture Clarence Town WWTW Pooling.pdf
- Item 3c Invoice for GWA85683.pdf
- Item 4a Karuah Rain Gauge Data.docx
- Item 4b PO for KAR Weather Station.docx
- Item 5 RW UV Systems - UVT Performance.xlsx
- Item 6 20161013_N1 Toolbox Talk.pdf

- Item 7a Corporate Mail - RE_ Kurri TAFE Pond.pdf
- Item 7b Corporate Mail - RE_ More text for the File Note.pdf
- Item 7c Corporate Mail - RE_ Effluent Supply from Kurri Kurri WWTW.pdf
- Item 8 Veolia reporting April 2017.pdf
- Item 9 Corporate Mail - Early Warning - Kurri.pdf

Summary of reason for grade

Hunter Water manages its recycled water through a hierarchy of documents supported by its IMS. The Corporate RWQMP is a roadmap for the recycled water management system, structured according to the elements, components, and actions set out in the AGWR *Framework for management of recycled water quality and use*. This corporate RWQMP is supported by scheme specific RWQMPs and supporting documentation. During the audit, we focussed on Kurri Kurri WWTW scheme.

We acknowledge the significant effort Hunter Water has undertaken in the development of the RWQMP including the corporate and specific documents. This approach ensures consistency between the schemes while allowing the approach to be tailored to meet specific requirements of each scheme.

The Corporate RWQMP makes a number of statements regarding activities that will be done, rather than what is currently being undertaken. There are also a number of circumstances where the corporate and site specific RWQMPs each states that the required actions are documented in the other RWQMP. Across some aspects of the recycled water management system there were a number of shortcomings that did not result in identified public health or environmental impacts during the audit period. These gaps should be identified as part of the work associated with Recommendation 2015/16-05.

Generally, there was good alignment between the requirements of this clause and Hunter Water's compliance. Key findings are documented in Table B-8.

Table B-8. Element-by-element summary of findings for 2.2.1.

Element	2.2.1	Key Findings
1: Commitment to responsible use and management of recycled water quality	Full	Processes are in place to document responsible uses of recycled water, regulatory and formal requirements and partnerships and engagement with stakeholders. There is an appropriate structure for the documentation and the management of stakeholders and their obligations.
2: Assessment of the Recycled Water System	High	A process is in place for preparing for and undertaking risk assessment reviews, with a schedule of risk assessments provided. Issues were noted with currency of language in the Corporate RWQMP for this element. No evidence was provided for the requirement of field verification of the process flow diagrams.
3: Preventive Measures for Recycled Water Management	High	Processes are in place for identifying preventative measures as part of the scheme specific risk assessments. Processes to identify CCPs are documented within the Hunter Water *Establishment and Review of Recycled Water CCP* standard. It was noted that the basis for determining CCPs is not well established within the documentation in particularly in regard to alignment with the validation program undertaken, this is further discussed under Element 9.
4: Operational Procedures and Process Control	Full	Operational procedures and processes are generally in place with evidence provided of a Veolia operating manual for Kurri Kurri WWTW. Processes for operational monitoring and corrective actions are documented in the WWTW RWQMPs.

Element	2.2.1	Key Findings
5: Verification of Recycled Water Quality and Environmental Performance	Full	A verification monitoring program is in place with evidence provided for Kurri Kurri WWTW. A process is in place for consumer complaints and response, including a system of training of front line staff. Veolia procedures are in place to review water quality data and notification protocols from Veolia to Hunter Water and Hunter Water to NSW Health for exception reporting.
6: Management of Incidents and Emergencies	Full	Communication and incident and emergency management protocols are in place, with evidence provided for both Hunter Water and Veolia's systems, including documentation of notification protocols.
7: Operator, Contractor and End User Awareness and Training	Full	Mechanisms for operator, contractor and end users training and awareness are documented within the Corporate RWQMP. Measures to increase employee awareness include training, risk assessment workshop and attendance recycled water quality committee meetings. Training requirements/obligations for end users are outlined in the end user agreements, with evidence provided for Kurri Kurri TAFE, which states that general induction training must be undertaken by end users.
8: Community Involvement and Awareness	Full	Hunter Water have an overarching Stakeholder Engagement Standard that governs how recycled water consultation is managed, with recycled water specific details included in the corporate RWQMP.
9: Validation, Research and Development	Adequate	The RWQMP includes processes for validation, revalidation, and research and development, however we noted gaps with a circular reference in both the corporate RWQMP and site specific RWQMP referring to each other. The process for validation of critical limits is not well described, including a lack of documented justification for the selection of monitoring parameters and critical limits.
10: Documentation and reporting	Full	There are established procedures for the management of documentation and records for both Hunter Water and Veolia. There are established procedures for external and internal reporting from Veolia to Hunter Water and from Hunter Water to agencies and end users. A potential gap exists regarding how soil, ground water and surface water monitoring at end user sites and water quality trends are identified and reported on an annual basis. However this gap was graded in Element 11.
11: Evaluation and Audit	High	A process is in place for audits and for evaluation of data in advance of risk assessment. The corporate RWQMP proposes that an annual review be undertaken, however this is written in the future tense. A few minor issues were also noted with the annual inspection reports.
12: Review and Continuous Improvement	Full	There is a high-level recycled water quality improvement plan in place, that includes branch accountability, timelines and status tracking. Processes are in place for review by senior management as part of the 6 monthly IMS review meeting and quarterly water quality meetings.

Discussion and notes

See detailed discussion below (Element-by-element discussion of the Framework for Management of Recycled Water Quality).

Recommendations

Recommendation 2.2.1-1: By 30 December 2018 Hunter Water should update the Corporate RWQMP to document current activities and processes. This should include filling any gaps identified as part of Recommendation 15/16-05.

Recommendation 2.2.1-2: By 30 September 2018, Hunter Water should:

- Develop a table in each scheme RWQMP that documents the evidence for the selection of the CCP, its associated monitoring parameter(s) and limits. This should include sufficient document control to capture when changes are made and the basis of those changes.
- Consult with NSW Health on the validation testing program for the water recycling schemes.
- Specify the performance required of the UV units in their operating context and determine whether they are achieving this performance. Any failure in the performance of prevalidated UV units should be further investigated.

Opportunities for improvement

OFI 2.2.1-1: Consider reviewing the annual inspection report, to include receiving environment monitoring

Clause 2.2.2

Table B-9. Clause 2.2.2 compliance grade

Subclause	Requirement	Compliance grade
2.2.2	Hunter 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 system, including to the satisfaction of NSW Health.	Adequate

Risk	Target for full compliance
Incomplete implementation of the Recycled Water Management System has the potential to result in a high risk to public health and the environment.	Evidence that the Recycled Water 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.

Evidence sighted

See evidence listed in Clause 2.2.1

Summary of reason for grade

This clause requires Hunter Water to fully implement the RWQMP developed as a requirement of Clause 2.2.1. Hunter Water must undertake all relevant activities in accordance with the system and NSW Health must be satisfied these requirements have been discharged.

Generally, there was satisfactory implementation of the recycled water quality management system. A number of shortcomings were identified and are summarised in Table B-10. We would like to commend Hunter Water for the following aspects:

- Documentation of the operation and maintenance associated with end user hand over points was industry best practice.
- Monthly WWTW management reporting by Veolia was well-balanced, being both clear and comprehensive
- The collaborative nature of the relationship ('best for project') between Veolia and Hunter Water was noted as being a key factor of the successful implementation of a risk based approach to recycled water management.

Table B-10. Element-by-element summary of findings for clause 2.2.2.

Element	2.2.2	Key Findings
1: Commitment to responsible use and management of recycled water quality	High	The recycled water policy is current with the policy approved by the Managing Director in June 2017. The end user handover points were well documented, with clear descriptions, pictures and maps included in the Recycled Water Asset Construction and Maintenance Standard. Minor aspects relating to the regulatory and formal requirements component of this element were noted.
2: Assessment of the Recycled Water System	High	Four risk assessments were undertaken in the audit period. Appropriate attendance of regulatory stakeholders was noted. The field audit identified some inaccuracies in the Kurri Kurri WWTW recycled water process schematic. The risk assessments were undertaken at a high level and it was difficult to confirm the level of detail considered in the workshop from the risk register and subsequent follow up actions.
3: Preventive Measures for Recycled Water Management	Adequate	Preventive measures are documented in scheme specific RWQMPs and risk assessment, with evidence provided of a number of risk assessments. Not all CCPs were entered into SCADA in the audit period, though request for SCADA changes had been noted in the SCADA change registers.

Element	2.2.2	Key Findings
		The LRVs reported in the *Validation Testing Program* for the three samples taken across the UV units from Kurri Kurri WWTW and Cessnock WWTW did not support the selection of these unit processes as critical control points (less than 0.1 LRV for viral, protozoan and bacterial surrogates for Cessnock WWTW and 0.3 LRV for protozoan and 0.4 LRV for bacterial surrogates for Kurri Kurri WWTW).
4: Operational Procedures and Process Control	Full	Operational procedures and processes are in place with evidence provided of Veolia's Kurri Kurri WWTW operating manual. Evidence of operational monitoring was provided with the Kurri Kurri WWTW plant spreadsheet. Issues were noted for CCP limits not entered into SCADA in the audit period for some WWTWs. This is covered under Element 3. Reporting in the Veolia Contract Monthly reporting was well done.
5: Verification of Recycled Water Quality and Environmental Performance	Full	Evidence was provided of verification water quality monitoring data for Kurri Kurri WWTW. Details of recycled water quality exception reports are provided to NSW Health in a quarterly water quality exception report and the results discussed at the quarterly Water Quality meeting. Veolia provided a comprehensive monthly contractor report that included recycled water performance.
6: Management of Incidents and Emergencies	Full	Evidence was provided of two incidents that occurred at Kurri Kurri WWTW, including notification to NSW Health and records of verbal notification to end users. We did however note that the Integrum incident form was marked as 'draft'. To avoid double counting this is graded in Element 11.
7: Operator, Contractor and End User Awareness and Training	Full	Evidence was provided of Hunter Water and Veolia staff training on recycled water management systems. We saw evidence that induction training is included in end user site management plans, however the annual inspection undertaken by Hunter Water of end users did not check records of induction training.
8: Community Involvement and Awareness	Full	Evidence was provided of the end user customer agreements, annual inspection reports for Kurri Kurri TAFE and Kurri Kurri Golf Club and a screen shot of the recycled water section of Hunter Water's website.
9: Validation, Research and Development	Adequate	Evidence of validation is documented in the Recycled Water Scheme Validation Report. There are a number of aspects associated with the preventive barriers, their validation and verification that remain unresolved. These include UV units not working as expected, the basis behind CCP validation and end user treatment processes (refer to Table B-11). Actions are outstanding for implementing helminth preventive measures for those sites that supply to farms operating with livestock.
10: Documentation and reporting	Full	We were provided evidence of comprehensive monitoring undertaken by Veolia as part of its contractor monthly reports. The document management system was audited. Where requested documents and records could be found and were provided by both Hunter Water and Veolia.
11: Evaluation and Audit	Adequate	There were a number of minor shortcomings noted in the implementation of this element. These include that internal audits and annual reviews were not all undertaken according to schedule and there was no reporting of the annual water quality review.
12: Review and Continuous Improvement	Full	A recycled water quality improvement plan was provided that documents actions and status of actions. Only one action was not completed within the audit scope period due date, which was noted as an ongoing improvement and is further discussed as part of Recommendation 2.2.2-1. An internal audit was undertaken of Element 1 recommending updating the recycled water quality policy, which was subsequently updated by the new Managing Director. Water quality actions are also tracked through recycled water monthly meetings held between Veolia and Hunter Water.

Discussion and notes

See detailed discussion below (Element-by-element discussion of the Framework for Management of Recycled Water Quality).

Element-by-element discussion of the Framework for Management of Recycled Water Quality and Use

1 Commitment to responsible use and management of recycled water quality

This element involves understanding regulatory and formal requirements, the development and implementation of a recycled water quality policy, and understanding and engaging with stakeholders.

Responsible use of recycled water: This component requires involving agencies with responsibilities and expertise in protection of public and environmental health and ensuring that design, management and regulation of recycled water schemes is undertaken by agencies and operators with sufficient expertise.

The Corporate Recycled Water Quality Management Plan (RWQMP)[168] describes how Hunter Water engages with stakeholders specific to a scheme discussed in the site specific RWQMPs. Stakeholder details and roles and responsibilities are identified in the RWQMP. Stakeholders include internal Hunter Water departments as well as external agencies such as NSW Health and the recycled water customer. Kurri Kurri RWQMP was provided as evidence, Section 1.3 of this plan identifies the two end users of the scheme (Kurri Kurri Golf Course and Kurri Kurri TAFE) as stakeholders specific to the scheme.[169]

Regulatory and formal requirements: This component requires identification and documentation of all relevant regulatory and formal requirements. Hunter Water should identify the governance of recycled water schemes for individual agencies, designers, installers, operators, maintainers, owners and users of recycled water and ensure that responsibilities are understood and communicated to designers, installers, maintainers, operations employees, contractors and end users. The requirements of this component should be reviewed periodically, to reflect any changes.

Key agencies, roles and responsibilities and obligations of the main parties involved in recycled water management are detailed within the Corporate[170] and scheme specific RWQMP. Communication of these requirements are met via the intranet and internet along with customer specific recycled water agreements. Hunter Water advised that a review of the formal requirements occur as the recycled water management plans are updated or as required. Handover points were clearly documented, with maps and pictures of infrastructure, in the Recycled Water Asset Construction and Maintenance Standard.[171]

There was an issue of accuracy in Table 1-3[168], with the reference to obligations under *NSW Public Health Act 2010* not relating specifically to recycled water. Section 16 of this Act provides NSW Health the power to take action with respect to unsafe water, where unsafe water is defined as both drinking and any other water that is likely to be a risk to public health.

We raise specific governance areas that require consideration by Hunter Water:

- The Kurri Kurri TAFE extracts effluent from a weir that Hunter Water reported was owned by Roads and Maritime Services. Hunter Water is unsure about the legislative arrangements regarding this extraction. An end user agreement between Hunter Water and Kurri Kurri TAFE may not be required if ownership of this water has transferred to the state.

[168] HW2008-1592 20 22.001 - Corporate Recycled Water Quality Management Plan - Pre 30 June 17.docx
[169] Kurri_Kurri_WWTW_Recycled_Water_Quality_Management_Plan_June 2016.docx
[170] E1 - Compliance calendar.jpg
[171] E4 - Recycled Water Asset Construction and Maintenance CURRENT.DOCX

- In the validation report, treatment LRVs for Dora Creek are assigned to Eraring Energy. The gap analysis in previous ministerial recommendation 2015-16-05 should include a review to ensure end user responsibilities are identified and understood by Eraring Energy, given significant log reduction values that are attributed to a third party for pathogen reduction.

Partnerships and engagement of stakeholders (including the public): This component requires that all agencies with responsibilities for water resources and use of recycled water be identified and regularly updated. Hunter Water should establish partnerships with agencies or organisations as necessary or where this will support the effective management of recycled water schemes, identify all stakeholders affecting, or affected by, decisions or activities related to the use of recycled water and engage users of recycled water; ensure responsibilities are identified and understood and develop appropriate mechanisms and documentation for stakeholder commitment and involvement.

Hunter Water noted that relevant agencies involved in recycled water are identified within the RWQMPs. The corporate RWQMP details external stakeholders and their roles and responsibilities in Table 1-2. Recycled water customers are engaged via the recycled water agreements which are detailed in the WWTW RWQMPs. Hunter Water noted that each end user has an agreement for the supply of recycled water detailing requirements. Evidence was provided of end user agreements for the Kurri Kurri recycled water schemes for Kurri Kurri TAFE and Kurri Kurri Golf Club.[172] The end user agreement for Kurri Kurri TAFE was signed and executed in the audit period (date recorded in the file name). The appropriate governance for Kurri Kurri TAFE should be confirmed (i.e. if extraction is subject to the *Water Management Act 2000* then an end user agreement is not an appropriate instrument)

Recycled water policy: This component requires Hunter Water to implement a recycled water policy, endorsed by senior managers and ensure that the policy is visible and is communicated, understood and implemented by employees and contractors. Hunter Water has a Recycled Water Policy which was approved by the Managing Director on the 30th June 2017.[173] The policy was on display in the meal room during the site visit.

This element has been found to have full compliance for clause 2.2.1 and high compliance for clause 2.2.2 due to the governance areas for consideration.

2 Assessment of the Recycled Water System

Intended uses and source of recycled water: This component required Hunter Water to identify source of water, intended uses, routes of exposure, receiving environments, endpoints and effects and consider inadvertent or unauthorised uses.

Hunter Water noted that the source of recycled water is typically effluent from the wastewater treatment works, with intended uses generally being industrial, municipal and agricultural end uses. Kurri Kurri RWQMP was provided as evidence, with the recycled water process schematic and plan text including details of the source water, treatment process, end users storage, intended uses, routes of exposure, receiving environments, endpoints and inadvertent uses.[174] This information was also included in scheme specific risk assessment background information documents, with Branxton WWTW and Morpeth WWTW briefing papers provided as evidence.[175]

Recycled water system analysis: This component requires Hunter Water to assemble pertinent information and document key characteristics of the recycled water system to be considered, assemble a team with appropriate knowledge and expertise and construct a flow diagram of the

[172] E8 - Kurri GC Signed Agreement Oct 2015.pdf; E1 - Kurri TAFE Executed Agreement Oct 16 - Jun 21.pdf
[173] E1 - Recycled Water Policy.pdf
[174] Kurri_Kurri_WWTW_Recycled_Water_Quality_Management_Plan_June 2016.docx
[175] Branxton WWTW Risk Workshop Update Background Notes 2016 V2.docx; Morpeth WWTW Risk Workshop Update Background Notes 2017 V1.docx

recycled water system from the source to the application or receiving environments. Hunter Water is also required to periodically review the recycled water system analysis.

The recycled water quality risk assessment background information reports describe the information collated for the risk assessment workshops. We confirmed this for the recycled water quality risk assessments for Branxton and Morpeth WWTWs.[175] These reports document key system characteristics and include a process flow diagram of the system. The background information reports and the risk register attendance lists included details of the risk management team, with attendance of regulatory stakeholders including NSW Health and the EPA. It was however noted that the Branxton risk review workshop did not include a representative from Veolia, and all other risk assessments did not include attendance by end users.

No evidence was provided for field verification of the process flow diagrams. The audit field verification identified some inaccuracies in the Kurri Kurri WWTW recycled water process schematic included within the Hunter Water WWTW RWQMP, including that the golf course is supplied from the Swamp Creek licensed discharge point rather than before it, as indicated on the diagram. The diagram would also benefit from indicating which chemical dosing points are in use and which are disused.

Assessment of water quality data: This component requires Hunter Water to assemble historical water quality data about sewage as well as data from treatment plants and of recycled water supplied to users, to identify gaps and assess reliability of data. The data needs to be assessed using tools such as control charts and trend analysis, to identify trends and potential problems.

An assessment of water quality data is included within the recycled water quality risk assessment background information report, with evidence provided of Morpeth and Branxton WWTWs.[175] A summary of water quality was included for the preceding two years (effluent data). However the component requirement also includes analysis of sewage and treatment data that was not included in the analysis.

Hazard identification and risk assessment: This component requires Hunter Water to identify all potential hazards and hazardous events for each component of the recycled water system and assess the level of risk they present to human and environmental health. Hunter Water must 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. Hunter Water must also periodically review and update the hazard identification and risk assessment to incorporate any changes.

Hunter Water's corporate RWQMP documents their risk assessment methodology in section 2.4. There were a number of issues in the currency of language in this section, for example in section 2.4.2 review and update, it states that "*no date has been set for reviewing and revising the risk assessment...*", even though we were provided with a number of risk assessment reviews that were carried out within the audit scope. Risk assessments were carried out in the audit period for Branxton, Clarence Town, Morpeth and Karuah recycled water schemes.[176] A schedule of risk assessment, sent to NSW Health, was provided as evidence of scheduling of risk assessments.

The hazard identification and risk workshops were facilitated by an independent consultant and attended by the relevant stakeholders, including NSW Health and the EPA, with attendance records documented in the risk assessment spreadsheet.[176] Emails were provided of attendance of end users at the Branxton WWTW risk assessment and that for the Morpeth WWTW end users were not invited due to no significant changes occurring in the treatment process.[177] The risk assessment

[176] Working Paper - Branxton Risk Assessment Post Workshop update 2016.XLSM; Working Paper - Clarence Town Risk Workshop Worksheet 2017.XLSM; Working Paper - Morpeth Risk Assessment Post Workshop update 2017.XLSM; Working Paper - Karuah Risk Workshop Worksheet 2017.XLSM

[177] Re: Recycled Water Risk Assessment Workshop Branxton Recycled Water Scheme.msg; Re: Recycled Water Risk Assessment Workshop Branxton Recycled Water Scheme.msg

spreadsheet and the risk assessment update summary document provided details on identification and level of risk. The WWTW risk assessments are very high level and as such it is difficult for the auditors to comment on the adequacy of the risk assessment provided as evidence.

This element has been found to have high compliance for clause 2.2.1 and 2.2.2 due to the issues with no evidence being provided to demonstrate field verification of the flow diagrams and subsequent inaccuracies.

3 Preventive Measures for Recycled Water Management

Preventive measures and multiple barriers: This component requires Hunter Water to 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 and document the preventive measures and strategies, addressing each significant risk.

The corporate RWQMP documents the process for identifying preventive measures as part of the scheme specific risk assessments. Scheme specific risk assessment spreadsheets were provided for Branxton, Clarence Town, Morpeth and Karuah recycled water schemes.[178] Risks were assessed both with and without identified preventive measures, consistent with the AGWR, and recommendations were used to capture additional preventive measures. Details on scheme specific preventive measures are outlined in the scheme specific RWQMP.[179] We checked the Karuah WWTW risk assessment carried out in May 2017 where three recommended actions had been made which were confirmed to have been carried through to the recycled water quality improvement plan.[180] As the risk assessments were high level, it was difficult to assess the adequacy of barriers chosen as part of the risk assessments. The poor performance of UV was noted at Cessnock and Kurri Kurri and is further discussed in Element 9.

Critical control points: This component requires Hunter Water to assess preventive measures throughout the recycled water system to identify critical control points, establish mechanisms for operational control and document the critical control points, critical limits and target criteria.

Hunter Water noted that CCPs are determined as per the Establishment and Review of Recycled Water CCP standard[181] and are documented within the site specific RWQMPs along with associated limits. Hunter Water provided evidence for Kurri Kurri, with CCPs documented in Table 4-1 of the Kurri Kurri RWQMP.[179]

Hunter Water provided screen shots of the associated limits in SCADA for a number of schemes that showed a page where critical limit information is displayed.[182] A register of SCADA changes was provided for both Veolia and for Hunter Water, showing that CCP limits were established in SCADA within the audit period for Edgeworth, Karuah, Clarence Town, Dungog and Cessnock water recycled schemes.[183] We noted that requests had been submitted for CCPs to be entered into SCADA within the audit period but were ongoing in 2017-18 for Kurri Kurri, Morpeth and Dora Creek recycled

[178] Working Paper - Branxton Risk Assessment Post Workshop update 2016.XLSM; Working Paper - Clarence Town Risk Workshop Worksheet 2017.XLSM; Working Paper - Morpeth Risk Assessment Post Workshop update 2017.XLSM; Working Paper - Karuah Risk Workshop Worksheet 2017.XLSM

[179] Kurri_Kurri_WWTW_Recycled_Water_Quality_Management_Plan_June 2016.docx

[180] E12 - Recycled Water Improvement Plan.xlsx

[181] E3 - Establishment and Review of Recycled Water CCPs CURRENT.DOCX

[182] Rec 02 - 2014-15 - Branxton WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Cessnock WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Clarence Town WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Dora Creek WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Dungog WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Edgeworth WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Karuah WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Kurri Kurri WTW CCP's SCADA.docx; Rec 02 - 2014-15 - Morpeth WTW CCP's SCADA.docx

[183] Item 2a Veolia SCADA Change Register.xlsm; Item 2b HWC Register - SCADA change request 201711.xlsm

water schemes. CCPs were generally identified as process steps that had pathogen log reduction values associated with them.[174]

The commentary within the site specific RWQMPs does not adequately provide a basis for how CCP limits have been chosen, in particular how these limits relate to the validation results. This is discussed further in Element 9.

Veolia's site-specific RWQMP for Kurri Kurri[184] details the CCP control process, including that if any CCP alarms are triggered a priority zero alarm occurs and that an exceedance or non-conformance of the CCP occurs when a critical alarm occurs and the automated control action did not take effect. CCP alarm events are to be reported to Hunter Water as soon as practical using the incident report form to allow the Hunter Water to report to the regulator if required. Performance of CCPs is reported to Hunter Water through monthly contract reports[185] and Hunter Water report this to IPART in their annual performance report.[186]

This element has high compliance for clause 2.2.1 and adequate for clause 2.2.2.

4 Operational Procedures and Process Control

Operational procedures: This component requires that procedures required for all processes and activities applied within the whole recycled water system (source to use) are identified, documented and compiled into an operations manual.

Hunter Water have a number of procedures that govern the management of recycled water as detailed in section 4.1 of the Corporate RWQMP.[187] Documents are stored using TRIM and are available via the recycled water workspace.[188] Hunter Water advised that operational controls listed within the RWQMP were developed with Veolia.

Veolia's Plant Operating Manuals document processes and procedures at the WWTW, with evidence provided for Kurri Kurri.[189] Veolia documentation is controlled and communicated through the OnTap Document Centre, with a screenshot provided as evidence of access to documentation.[190] This is further discussed in Clause 7.1.

Operational monitoring: This component requires that monitoring protocols are developed for operational performance of the recycled water supply system, including the selection of operational parameters and criteria, and the routine analysis of results and that monitoring protocols are documented into an operational monitoring plan.

Hunter Water's WWTW RWQMPs contain scheme specific information on monitoring from source (trade waste) to end use (annual site audits). Section 7.1 of Veolia's WWTW RWQMP documents operational monitoring, with evidence provided for Kurri Kurri WWTW.[191] Internal operational monitoring is documented in the plant spreadsheet.[192] Evidence was provided for external sampling procedures documented in Kurri Kurri WWTW Sampling Guide Sheet and Kurri Kurri WWTW Sampling Calendar.[193] External laboratory analyses are coordinated by Hunter Water and conducted by ALS.

[184] 2.2.1 - Veolia Kurri Kurri WWTW operational manual.pdf
[185] E10 - Monthly Veolia contract report.pdf
[186] Compliance and Performance report 2016-17.pdf
[187] E4 - Kurri Kurri WWTW Recycled Water Quality Management Plan.docx; E4 - Corporate Recycled Water Quality Management Plan - Current.docx
[188] E4 - Recycled water workspace.jpg
[189] E4 - MN-HWW-20-7812 Kurri Kurri Operation Manual.pdf
[190] E4 - Veolia Document Control and Access for Operators.docx
[191] 2.2.1 - Kurri Kurri Sampling Calendar.xls; 2.2.1 - Kurri Kurri Sampling Guide sheet.docx
[192] E4 - Kurri Kurri WWTW Plant spreadsheet 27092017.xlsb
[193] 2.2.1 - Kurri Kurri Sampling Calendar.xlsx; 2.2.1 - Kurri Kurri Sampling Guide sheet.docx

Evidence was provided by Veolia of UVT data (both instrumentation and laboratory data) for systems with UV units. Data (where available) was provided for Cessnock, Edgeworth, Karuah, Kurri Kurri and Morpeth and Veolia confirmed that the UV units were all pre-validated.[194]

Operational correction: This component requires Hunter Water to establish and document procedures for corrective action where operational parameters are not met and establish rapid communication systems to deal with unexpected events.

Hunter Water's and Veolia's WWTW RWQMPs contain scheme specific information on operational corrections, with evidence provided for Kurri Kurri WWTW.[187] Hunter Water's Recycled Water Quality Monitoring and Communication Standard details operational correction communication requirements, including water quality requirements triggers and actions, and notification contact details.[195] Corrective actions are also managed through SCADA monitoring, alarms and automated shutdown. As discussed under Element 3, while CCP alarms were not in place during the audit period for Kurri Kurri WWTW, evidence was provided of Kurri Kurri WWTW alarms in January 2017 related to UV and filter compliance[196] During the site visit the process to ensure recycled water was not supplied under this exceedance was discussed.

Equipment capability and maintenance: This component requires that Hunter Water ensures that equipment performs adequately and provides sufficient flexibility and process control and that a program for regular inspection and maintenance of all equipment, including monitoring equipment is established.

Evidence to support how Hunter Water manages its assets and planned maintenance is provided under clause 4.1 and therefore not repeated here. Hunter Water's Recycled Water Asset Construction and Maintenance Standards details customer specific asset responsibilities.[197] WWTW onsite equipment is monitored as part of operating procedures with key tasks detailed in the RWQMPs. Veolia track daily tasks via the plant operational spreadsheets, with dates and comments noted for area of plant and description of actions undertaken.[198] A series of work orders was provided as evidence for maintenance work undertaken.[199]

Materials and chemicals: This component required that only approved materials and chemicals are used and documented procedures for evaluating chemicals, materials and suppliers are established.

The chemicals used at Hunter Water WWTWs are managed by Veolia as detailed in the RWQMP. Hunter Water requires that all components used in the water and sewer networks to be approved products and comply with AS/NZ 4020. Evidence was provided of approved Products & Manufacturers Registers available on the Hunter Water website.[200] Veolia work instructions were provided as evidence for the ordering, testing and delivery of alum, ferrous, sodium hydroxide and sodium hypochlorite.[201]

This element was found to be fully compliant for both clause 2.2.1 and 2.2.2.

5 Verification of Recycled Water Quality and Environmental Performance

Recycled water quality monitoring: This component requires that the characteristics, monitoring points and frequencies are determined.

[194] Item 5 RW UV Systems - UVT Performance.xlsx
[195] E4 - Recycled Water Quality Monitoring and Communication CURRENT.DOCX
[196] WWTW alarm list.pdf
[197] E4 - Recycled Water Asset Construction and Maintenance CURRENT.DOCX
[198] E4 - Kurri Kurri WWTW Plant spreadsheet 27092017.xlsb
[199] E4 - Veolia Kurri WWTW maintenance tasks.pdf
[200] E4 - Hunter Water approved products website.jpg
[201] E4 - Veolia Alum ordering, delivery and testing.docx; E4 - Veolia Ferrous ordering, delivery and testing.docx; E4 - Veolia Sodium Hydroxide ordering, delivery and testing.docx; E4 - Veolia Sodium Hypochlorite ordering, delivery and testing.docx

Section 5.1 of the corporate RWQMP covers recycled water quality monitoring. Hunter Water has a statutory obligation to follow the Reporting Manual for the operating licence which states that Hunter Water must manage recycled water quality in accordance with Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (2006) (unless NSW Health specifies otherwise) to the satisfaction of NSW Health, any other guidelines specified by NSW Health to the satisfaction of IPART and the manner and form of recycled water quality reporting as specified in the IPART Reporting Manual.

Details of recycled water verification monitoring are included in the Recycled Water Quality Monitoring Plan.[202] The frequency of monitoring has been determined based upon contractual requirements, AGWR requirements and EPL requirements. Hunter Water have a contract with ALS to provide analysis of samples. Veolia has also developed sampling calendars that detail their requirements.[203] Sample points are identified based on scheme-specific arrangements and are listed in the scheme-specific RWQMP and monitoring plan.

A sample schedule for Kurri Kurri WWTW[204] and the plant spreadsheet[205], which includes verification monitoring data, was reviewed and demonstrates compliance with this element. Hunter Water provided evidence of monitoring of recycled water quality performance in its annual performance monitoring report.[206]

Application site and receiving environment monitoring: This component requires that the characteristics to be monitored and the points at which monitoring will be undertaken are determined.

Hunter Water uses end user agreements to manage the requirements of the receiving environments. End user agreements were provided as evidence for Kurri Kurri TAFE and Kurri Kurri Golf Club.[207] The end user agreements state the need for a site management plan that includes monitoring. Evidence was provided of management plans for Kurri Kurri TAFE and Kurri Kurri Golf Club. [208] We noted that the Kurri Kurri TAFE management plan was not finalised or signed off by Hunter Water. The Kurri Kurri Golf Club's management plan states that they monitor the receiving environment through visual inspections and soil monitoring. End user inspections are carried out by Hunter Water on an annual basis.[209] Hunter Water advised during the audit interviews that end user monitoring data was visually inspected as part of the inspection. Evidence was provided of annual inspection reports for Kurri Kurri TAFE and Kurri Kurri Golf Club, while a comment was made for the Golf Club inspection report that soil samples were taken in greens, no further details of monitoring undertaken was provided and no line item is provided on the checklist for recording that end user monitoring data was checked.[210] In the audit interviews Hunter Water noted that recycled water users undertake monitoring of application sites to meet their site requirements (e.g. to determine soil condition requirements for the golf course).

Documentation and reliability: This component requires that a sampling plan is established and documented for each characteristic, including the location and frequency of sampling, ensuring that monitoring data is representative and reliable.

[202] E5 - Recycled Water Quality Monitoring Plan - CURRENT.DOCX
[203] 2.2.1 - Kurri Kurri Sampling Guide sheet.docx; 2.2.1 - Kurri Kurri Sampling Calendar.xlsx
[204] E5 - Sample Schedule Kurri Kurri WWTW.pdf
[205] E4 - Kurri Kurri WWTW Plant spreadsheet 27092017.xlsb
[206] Compliance and Performance report 2016-17.pdf
[207] E8 - Kurri TAFE Executed Agreement Oct 16 - Jun 21.PDF; E8 - Kurri GC Signed Agreement Oct 2015.PDF
[208] E5 - Kurri Golf Club Management Plan.pdf; TAFE Recycled Water Customer Management Plan DRAFT.docx
[209] Recycled Water Visit Register MASTER.xls
[210] E5 - Report - Kurri GC Annual site inspection 9 May 2017.XLSX; E5 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS

Details of recycled water verification monitoring are included in the Recycled Water Quality Monitoring Plan[211] and end users management plans.[212] Veolia have documented sampling calendars that detail their sampling requirements. Hunter Water produces a quarterly report to NSW Health for recycled water quality verification results. Evidence was provided of a report of recycled water quality exceptions for April to June 2017.[213] Hunter Water produces a monthly report of WWTW verification monitoring data, with evidence provided for July 2016.[214] Monthly meetings are held with Veolia that include recycled water quality. Evidence was provided of the March 2017 Monthly Recycled Effluent Meeting Agenda, which we noted includes discussion on quality and monitoring.[215]

Satisfaction of users of recycled water: This component requires that an enquiry and response program is established for users of recycled water, including appropriate training of people responsible for the program.

Hunter Water noted that satisfaction of users is discussed at customer site inspections and meetings. Complaints by the customer can be made directly to the Account Executive in Customer Services or customers can contact Hunter Water via the recycled water notifications email address and contact centre. Evidence of training (competency assessment record) for a customer service representative was provided.[216]

Short-term evaluation of results: This component requires that procedures be established for the short-term review of monitoring data and satisfaction of users of recycled water and the development of reporting mechanisms internally and externally, where required.

Veolia provide Hunter Water with weekly reports detailing sample results against required quality parameters, these reports flag analytes that are out of range of requirement.[217] Recycled water quality is also discussed at Veolia monthly meetings.[218] The reporting requirements for routine sampling are detailed in the Recycled Water Quality Monitoring and Communication Standard.[219]

Corrective responses: This component requires the establishment and documentation of procedures for corrective responses to non-conformance or feedback from users of recycled water and the establishment of rapid communication systems to deal with unexpected events.

Procedures are in place to review water quality data and notification protocols for exception reporting. Corrective responses are detailed in Table 4-1 of the recycled water quality management plans. Communication details and reporting requirements can be found in the Recycled Water Quality Monitoring Plan[220] and Communication Standard and the Recycled Water Quality Incident Response Procedure.[221] This is further discussed in Element 6.

The element has been found to be fully compliant for clause 2.2.1 and 2.2.2.

[211] E5 - Recycled Water Quality Monitoring Plan - CURRENT.DOCX
[212] E5 - Kurri Golf Club Management Plan.pdf; E5 - Kurri Tafe Management Plan.docx
[213] 2.1 EL10 A10.2.2 HW2006-1448 41 7.010 Report - Quarterly to NSW Health - DW and RW Quality Exceptions April to June 2017.doc
[214] Recycled_Water_Report20160713.xlsx
[215] E5 - Recycled Water Operational Meeting.docx
[216] Contact centre Competency Assessment Record.pdf
[217] E5 - Recycled Water Quality Report 20170920.xlsx
[218] E5 - Recycled Water Operational Meeting.docx
[219] E5 - Recycled Water Quality Monitoring and Communication CURRENT.DOCX
[220] E5 - Recycled Water Quality Monitoring Plan - CURRENT.DOCX
[221] E5 - Procedure - Recycled Water Quality Incident Response CURRENT.DOCX

6 Management of Incidents and Emergencies

Communication: This component requires Hunter Water to define communication protocols with the involvement of relevant agencies, prepare a contact list of key people, agencies and stakeholders and develop a public and media communications strategy.

The MoU between NSW Health and Hunter Water requires that any event that may adversely affect public health must immediately be reported to NSW Health. Hunter Water has prepared a Recycled Water Quality Incident Response Procedure that outlines notification protocols for external agencies in the event of a recycled water quality incident.[222] Hunter Water advised that this document was developed in liaison with NSW Health, and to work in conjunction with Veolia's incident procedures. Veolia have an overarching Incident and Emergency Response Manual and procedures that cover notification protocols.[223] Hunter Water has an overarching Emergency Management Plan that covers public and media communication strategies.[224] Hunter Water advised that end user customers are notified verbally of potential issues. Evidence was provided of an issue of UV failure at Kurri Kurri WWTW in January 2017. Evidence was provided of the incident recorded as a Recycled Water Quality Incident in Integrum including details of notification to NSW Health and a record of notification to Kurri Kurri TAFE.[225] However we noted that the incident debrief as recorded in Integrum is marked as 'draft'.

Evidence was also provided of an incident in November 2016 at Kurri Kurri WWTW documented in Veolia's incident form of a UV compliance alarm where effluent was discharged with no UV disinfection[226] and a record of notification to the Golf Club.[227] These demonstrate the procedures work in practice.

Incident and emergency response protocols: This component requires that potential incidents and emergencies be defined and procedures and response plans documented with the involvement of relevant agencies, employees be trained and the emergency response plans are regularly tested and any incidents or emergencies are investigated and protocols revised as necessary.

Hunter Water has an Emergency Management Plan that defines incident and emergency response protocols.[228] A recycled water quality incident assessment has been developed by Hunter Water to be completed during a recycled water quality incident.[229]

Veolia's Incident and Emergency response manual and procedures document procedures and response protocols for incidents and emergencies.[230] Hunter Water provided evidence of a joint mock scenario debrief of a recycled water quality incident with Veolia.[231] The mock scenario involved CCP chlorination CT alert alarms at Mayfield West AWTP in May 2016, with a debrief in December 2016.

This element has been found to be fully compliant for clause 2.2.1 and 2.2.2.

7 Operator, Contractor and End User Awareness and Training

Operator, contractor and end user awareness and involvement: This component requires development of mechanisms and communication procedures to increase operator, contractor and

[222] E6 - Procedure - Recycled Water Quality Incident Response CURRENT.DOCX
[223] E6 - Veolia incident and emergency response procedure.docx; E6 - Veolia Incident and Emergency management manual.docx
[224] E6 - Corporate Emergency Management plan September 2016.docx
[225] E6 - Kurri UV issue Health Notification.pdf; E6 - Kurri Tafe notifications.png
[226] E6 - Kurri UV weir issue Veolia report.pdf
[227] E6 - Kurri Golf Club notifications.png
[228] E6 - Corporate Emergency Management plan September 2016.docx
[229] E6 - Recycled Water Quality Incident Assessment Checklist.docx
[230] E6 - Veolia incident and emergency response procedure.docx; E6 - Veolia Incident and Emergency management manual.docx
[231] E6 - Veolia mock scenario debrief.pdf

end user awareness of, and participation in, recycled water quality management and environmental protection.

Mechanisms for operator, contractor and end user awareness and involvement are documented in section 7.1 of the corporate RWQMP. Hunter Water notes that awareness of recycled water requirements occurs via a number of methods that include the Hunter Water website and internet, staff inductions, training, meetings and guidelines and manuals. The recycled water customers gain a further awareness of requirements via site inspections.

Operator, contractor and end user training: This component requires ensuring that operators, contractors and end users maintain the appropriate experience and qualifications, that training needs are identified and ensure resources are available to support training programs. Training needs to be documented and records maintained of all training sessions.

Hunter Water advised that Veolia staff are contractually required to be appropriately trained in operations. Veolia tracks training requirements through use of a training matrix. This training matrix included a line item for recycled water/CCP.[232] Veolia provided evidence of comprehensive recycled water awareness training presentation for their WWTW operators, that includes details of all WWTW sites, intended uses, water quality requirements (e.g. CCPs) and water quality objectives.[233] Evidence of Hunter Water recycled water training was provided including recycled water training and awareness presentation and a training register.[234] The recycled water awareness presentation includes an assessment at the end of the training to confirm competency of training.

Requirements for end user training are managed through end user agreements, with evidence provided for Kurri Kurri Golf Club, which states that end users' staff/contractors that work with recycled water must undergo general induction training, which we tracked through to the Golf Club Site Management Plan.[235] Hunter Water has developed a comprehensive customer recycled water awareness presentation that can be used by the customer to provide information on recycled water requirements.[236] Hunter Water advised that end users are made aware of their management requirements through annual site inspections including checking that requirements are being met. Review of the recycled water user inspection report form found that it does not contain an item to document inspection of training records.

The element was awarded full compliance for clause 2.2.1 and 2.2.2

8 Community Involvement and Awareness

Consultation with users of recycled water and the community: This component requires that an assessment of requirements for effective involvement of users of recycled water and the community be undertaken and that a comprehensive strategy for consultation is developed.

Hunter Water have an overarching Stakeholder Engagement Standard that governs how recycled water consultation is managed.[237] Hunter Water advised that consultation with end users occurs through attendance at risk assessments, communication via customer agreements, site visits and that the wider community can access recycled water information on Hunter Water's website. Evidence was provided of the end user customer agreements, end user annual recycled water use inspections for Kurri Kurri TAFE and Kurri Kurri Golf Club and a screen shot of the recycled water

[232] E7 - Veolia Training Matrix.pdf
[233] E7 - Veolia Recycled Water Awareness Training.pptx; E7 - Veolia training register.docx
[234] E7 - Recycled Water Awareness Training register.xlsx; E7 - Hunter Water Recycled Water Awareness Training
[235] E8 - Kurri GC Signed Agreement Oct 2015.PDF
[236] E8 - Recycled Water Customers awarness presentation.pptx
[237] E8 - Stakeholder Engagement Standard.docx

section of Hunter Water's website.[238] Customers are formally notified of the audit findings, with evidence provided of written correspondence to Kurri Kurri TAFE and Kurri Kurri Golf Club following the annual inspections.[239]

Communication and education: This component requires that an active two-way communication program be developed to inform users of recycled water and promote awareness of recycled water quality issues, provide information on the impacts of unauthorised use and on the benefits of recycled water use.

Processes for communication and education of end users is included in section 8.2 of the corporate RWQMP. Mechanisms are in place that include enquiries to the customer service centre, Hunter Water's website and through end user agreements and annual site inspections. Hunter Water has also developed a comprehensive customer recycled water awareness presentation, which covers restriction on use, safe use of recycled water, plumbing and pipework, backflow prevention, RWQMP and reporting requirements. [240] We were provided with evidence of ongoing liaison through the Kurri Kurri annual inspection reports and a register of notifications made to these end users.[241]

The element was full compliance for both clause 2.2.1 and 2.2.2

9 Validation, Research and Development

Validation of processes: This component requires that processes and procedures be validated to ensure they control hazards effectively and to revalidate processes when variations in conditions occur.

Section 9.1 of the corporate RWQMP covers validation of process, with validation details documented in the scheme specific RWQMPs. Kurri Kurri RQWMP was provided as evidence, with details of the validation testing program included in Table 9-1 of the plan. Details of validation undertaken for the schemes is documented in the Recycled Water Scheme Validation Report.[242]

There are a number of aspects associated with the preventive barriers, their validation and verification that remain unresolved. These are summarised in Table B-11.

Table B-11. Shortcomings associated with barrier effectiveness

Area	Issue
Operational data	The validation testing program does not contain the operational data to enable readers to understand the plant's operating condition at the time of validation. The validation of the selected operational parameters as surrogates cannot be confirmed nor the selection of critical limits.
UV	Cessnock, Edgeworth, Karuah, Kurri Kurri and Morpeth WWTW operate with pre-validated UV units.[243] Only 3 samples were taken across the UV units. The basis for the selection of these samples was not well described. Clarification on the selection criteria was sought during the audit interview. We were advised these were taken under storm conditions as they represented the worst case (high flow) condition. The UV verification results for Kurri Kurri and Cessnock do not show a significant log reduction in *E. coli* (which is an appropriate microbial surrogate for *cryptosporidium* for UV verification). From the information provided we could not establish if the UV

[238] E8 - Kurri TAFE Executed Agreement Oct 16 - Jun 21.PDF; E8 - Kurri GC Signed Agreement Oct 2015.PDF; E8 - Recycled Water website information.jpg; E8 - Report - Kurri GC Annual site inspection 9 May 2017.XLSX; E8 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS

239 E8 - Kurri Golf Club Audit findings Letter 16-17.docx; E8 - Kurri Tafe Audit findings Letter 16-17.docx

[240] E8 - Recycled Water Customers awarness presentation.pptx

E6 - Kurri Tafe notifications.png; E6 - Kurri Golf Club notifications.png; E8 - Report - Kurri GC Annual site inspection 9 May 2017.XLSX; E8 - Report - Kurri TAFE Annual Audit 9 May 2017.XLSX[242] E9 - WWTW Recycled Water Existing Schemes Validation Program - CURRENT.DOCX

[242] E9 - WWTW Recycled Water Existing Schemes Validation Program - CURRENT.DOCX

[243] Item 5 RW UV Systems - UVT Performance.xlsx

Area	Issue
	unit was operating in its validated range (and therefore should have been achieving its validated log reductions) or if it was outside the validation envelope. Further investigation should be undertaken to specify the performance required of the UV units in their operating context and determine whether they are achieving this performance, with further investigation of the cause of any failure (as the performance of pre-validated UV units should be assured).
End user recycled water treatment	At Dora Creek significant log reduction values are attributed to end user treatment, with evidence of validation not included within the report. An action for Eraring Energy for validation is included in the recycled water improvement plan with a due date in the 2017-18 audit period.

The validation results for UV log reduction values indicate that under the sampled conditions the UV units are not contributing to the overall pathogen reduction. This suggests either a design or operational failure.

A study was undertaken to determine if helminth control is adequate for the Hunter Water recycled water schemes supplying farming operations involving livestock. Currently lagoon treatment at Morpeth, Karuah and Farley WWTW cannot be assured to comply with the AGWR.[244]

Design of equipment: This component requires the design of new equipment, and infrastructure be validated to ensure continuing reliability.

Hunter Water's corporate RWQMP states that validation of new equipment and infrastructure is documented in the WWTW RWQMPs. We note that this is contradicted in the Kurri Kurri WWTW RWQMP which states that this action is discussed in the corporate RWQMP. The gaps that give rise to this circular reference should be identified as part of Recommendation 2015/16-05. We note that by comparison validation is well described in the Drinking Water Quality Management Plan.

Investigative studies and research monitoring: This component requires the establishment of programs to increase understanding of the recycled water supply system, and use this information to improve management of the recycled water supply system.

Hunter Water is an active member of organisations such as Water Research Australia and WSAA. Veolia also take part in research activities as part of their operations and recommend improvement activities. Hunter Water noted that the Recycled Water Team Leader attended the conference on the Recycled Water National Validation program.

The element was graded as adequate compliance for clause 2.2.1 and clause 2.2.2 due to a number of shortcomings associated with both the adequacy of the management system and the implementation of the validation and verification program.

10 Documentation and Reporting

Management of documentation and records: This component requires information pertinent to all aspects of recycled water quality management be documented, a document-control system to ensure current versions are in use be developed, a records-management system be established to ensure that employees are trained to complete records and that documentation is periodically reviewed and revised as necessary.

Section 10.1 of the corporate RWQMP covers management of documentation and records. Hunter Water further reports aspects of recycled water quality management within its Annual Report to IPART. In our review of clause 7.1, we sighted evidence of the document management system and the relationship of quality management to the Integrated Management System.

[244] E9 - Report - Helminth controls for Hunter Waters recycled water schemes.DOCX

TRIM HP Records Management is used as the main repository for records and Integrum for document control. On Tap is used by the treatment contractor. When requested by the auditors, documents and records could be found and were provided by both Hunter Water and the treatment contractor. Hunter Water has a corporate standard for document control which is discussed in detail under clause 7.1.

Reporting: This component requires that procedures be established for effective internal and external reporting and that an annual report be produced that is aimed at users of recycled water, regulatory authorities and stakeholders.

Various water quality reporting mechanisms are in place and this evidence has been tested under other elements including viewing of Water Quality Committee meeting minutes, reporting to NSW Health, reporting to IPART, and reporting through and on the Integrated Management System (clause 7.1). Hunter Water uses a corporate compliance calendar and register for tracking of reporting and compliance issues, with evidence provided of a screen shot of recycled water actions.

Veolia submits a monthly contractor report to Hunter Water, with section 4 covering wastewater treatment performance. The May 2017 monthly report was provided as evidence. The report includes performance reported against CCPs and the EPL. However for a number of WWTW CCPs had not been entered into SCADA and were not able to be reported on if there were no SCADA alarms.

Evidence was provided of a monthly data report that reports on WWTW effluent monitoring points on a weekly basis.[245] The use of colour coding for exceedance reporting, e.g. the first week faecal coliform or *E. coli* are detected will be reported in orange, the second week in red, helps to easily identify areas of concern.

Hunter Water is required to report according to its Reporting Manual as part of its Operating Licence requirements. Hunter Water produces an Annual Compliance and Performance Report to IPART which provides information on performance against Operating Licence clauses. Recycled water quality issues were reported at Kurri Kurri WWTW with exceedance of UV CCPs. Hunter Water advised IPART in its letter dated 31 March 2017 that significant changes to its recycled water quality management system had occurred, included a review of CCPs and associated updates to their RWQMPs (see clause 2.2.3 and 2.1.4).[246] There was a contradiction in statements within the annual performance report which stated that *"No significant changes to the recycled water quality management system were made during 2016-17"* and the letter to IPART where an item was included under significant changes in relation to reviews of CCPs associated with recycled water quality and associated updates to CCPs had been made. This discrepancy is noted here but graded at clause 2.2.4.

The element is considered fully compliant for clause 2.2.1 and clause 2.2.2

11 Evaluation and Audit

Long-term evaluation of results: This component requires Hunter Water to collect and evaluate long-term data to assess performance and identify problems, document and report the results.

Hunter Water advised in the questionnaire that historical water quality is reviewed and summarised in order to provide an evidence base for the risk assessments that are included within the risk assessment background information reports (discussed under Element 2).

Hunter Water provided a spreadsheet with a review of the recycled water quality data for the period 2016-17. The data is plotted and trended, however no explanatory note was provided and there was no evidence of how this data is reported or used to identify problems.

[245] Recycled_Water_Report20160713.xlsx
[246] REPORT ON SIGNIFICANT CHANGES TO OPERATING LICENCE - HWC - Jim Bentley.pdf

Audit of recycled water quality management: This component required Hunter Water to establish processes for internal and external audits, document and communicate the audit results.

We reviewed the overall approach to auditing under clause 7.1. Both Hunter Water and the treatment contractor have formal auditing procedures in place.[247] A formal audit schedule showing recycled water quality auditing requirements was in place, including review of the wastewater treatment plants and Hunter Water's RWQMP.[248] Evidence was provided of an internal audit report for Element 1 of the RWQMP undertaken by the Quality Manager in January 2017.[249] One recommendation was raised on the currency of the recycled water quality policy, with a recommendation for the new Managing Director to review, approve, sign and date the policy. As discussed in Element 1 a policy was provided as evidence that was approved in June 2017 by the Managing Director.

Hunter Water internal audits were scheduled for WWTW sites, however it was noted in the audit interviews that due to the certification process for other management systems these were not all carried out due to resourcing issues. During the audit interview the nexus of skills and independence that are required for robust outcomes was discussed. The audits are led by the Quality Manager with technical support provided by the Recycled Water Team Leader. Hunter Water should consider opportunities to source technical specialists to support its internal audit process so the technical specialists are not auditing their own work. This could be achieved by accessing technical specialists through mutual arrangements with neighbouring water utilities or qualified water quality management system auditors.

Hunter Water undertakes annual end user site inspections, evidence was provided of the annual inspection reports for Kurri Kurri TAFE and Kurri Kurri Golf Course.[250] The TAFE audit report identified a corrective action to implement an annual pressure test. We were advised during the audit interview that this was discussed on site with the end user and a letter was also provided as evidence sent to the TAFE advising the TAFE of the required action.[251]

Audit results are communicated to the Water Quality Committee and through Integrated Management System reviews (see also clause 7.1.3).

The element was high compliance for clause 2.2.1 and adequate for clause 2.2.2

12 Review and Continuous Improvement

Review by senior managers: This component requires that senior managers review the effectiveness of the management system and evaluate the need for change.

Hunter Water noted that a six monthly meeting (Management System Review Meeting) is held with the EMT to report on audit results and management system performance. Hunter Water provided evidence of the December 2016 IMS review meeting report, meeting minutes and the procedure for the IMS management review meeting.[252]

A quarterly Hunter Water and NSW Health Liaison Committee meeting is also used to provide information on system performance, with evidence provided of the meeting minutes of the March and June 2017 meeting, with attendance by the Hunter Water Acting General Manager Systems

[247] 2.1 EL11 A11.2.1 HW2013-421 11.002 Procedure - Conduct Management System Internal Audit – CURRENT.DOCX (next review due June 2017); 2.1 EL11 A11.2.1 HW2015-1449 1 9.043 Procedure - PR-ANZ-1-475 Audit.pdf.
[248] 2.1 EL11 A11.2.1 HW2013-421 9.008 Register - 2015 - 2018 Internal Audit Schedule.XLSX.
[249] Internal Quality Audit - Commitment to Responsible Use and Managt of RW Quality - El 1 - Jan 2017.DOCX
[250] E8 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS; E5 - Report - Kurri TAFE Annual Audit 9 May 2017.XLS
[251] E8 - Kurri Tafe Audit findings Letter 16-17.docs;
[252] E12 - IMS Review Meeting Report.doc; E12 - IMS Review Meeting Minutes.docx; E12 - Procedure IMS Management Review Meeting.docx

Operations. During the meeting discussions were held on progress of risk assessments, recycled water management plan improvements and recycled water incidents.[253]

Recycled water quality management improvement plan: The component requires that Hunter Water develops a recycled water quality management improvement plan and ensures that the plan is communicated and implemented, and that improvements are monitored for effectiveness.

Improvement actions are documented in the Recycled Water Improvement Actions Register, with an update carried out on 26 June 2017, as noted in the version control of the document to update action status and due dates.[254] Only one action was noted to not have been completed during the audit period, associated with setting CCP limits for helminths which was marked as ongoing.

This element is considered fully compliant for clauses 2.2.1 and 2.2.2.

Recommendations

Recommendation 2.2.2-1: By 30 September 2018 ensure the preventive measures for helminth control for agricultural sites (Karuah, Morpeth and Farley) achieve the required LRVs as per the AGWR.

Opportunities for improvement

OFI 2.2.2-1: Ensure appropriate people are included in risk assessments e.g. end users

[253] E10 - Minutes - Hunter Water NSW Health Liaison Committee Meeting - 8 March 2017.docx; • 2.1 EL2 A2.1.1 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.docx
[254] E12 - Recycled Water Improvement Plan.xlsx

Clause 2.2.3

Table B-12. Clause 2.2.3 compliance grade

Subclause	Requirement	Compliance grade
2.2.3	Hunter Water must notify IPART and NSW Health of any significant changes that it proposes to make to the Recycled Water Quality Management System in accordance with the Reporting Manual.	Full

Risk	Target for full compliance
Not having informed IPART and NSW Health of any significant changes proposed to the Recycled Water Quality Management System poses a risk of non-compliance with this licence clause.	Evidence to confirm that changes to the Recycled Water Quality Management System have been assessed for significance and that IPART and NSW Health have been notified.

Evidence sighted

- REPORT ON SIGNIFICANT CHANGES TO OPERATING LICENCE - HWC - Jim Bentley.pdf
  - 2.2.3 - NSW Health letter.pdf
- STATUS OF RECOMMENDATIONS-2015-16 OPERATIONAL AUDIT - HWC - Jim Bentley.pdf
- 2.1 EL2 A2.1.1 HW2006-1448 53 1.009 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 7 June 2017.docx
- E10 - Minutes - Hunter Water NSW Health Liaison Committee Meeting - 8 March 2017.docx
- 2.2.1 - Recycled Water Improvement Plan.xlsx
- Compliance and Performance report 2016-17.pdf

Summary of reason for grade

Hunter Water is required to report according to its Reporting Manual as part of its Operating Licence requirements. Hunter Water advised IPART in its letter dated 31 March 2017 that significant changes to its recycled water quality management system had occurred, included a review of the CCPs associated with recycled water quality and where necessary the RWQMPs.[255]

Discussion and notes

Hunter Water notes that changes to the Recycled Water Quality Management Plans (RWQMPs) are reviewed at its monthly Water Quality Committee meetings and that the significance of changes is discussed at those meetings. As discussed in Clause 2.1.3 we reviewed the Water Quality Committee terms of reference and consider this overarching statement adequate for capturing the requirements of this clause. A discrepancy was noted in its annual performance report to IPART that is discussed in Clause 2.2.4.

Recommendations

There are no recommendations as part of this clause.

Opportunities for improvement

There are no opportunities for improvement as part of this clause.

[255] REPORT ON SIGNIFICANT CHANGES TO OPERATING LICENCE - HWC - Jim Bentley.pdf

Clause 2.2.4

Table B-13. Clause 2.2.4 compliance grade

Subclause	Requirement	Compliance grade
2.2.4	Hunter Water must obtain NSW Health's approval for any significant changes proposed to be made to the Recycled Water Quality Management System before implementing or carrying out its activities in accordance with them.	High

Risk	Target for full compliance
Not having informed IPART and NSW Health of any significant changes proposed to the Drinking Water Quality Management System poses a risk of non-compliance with this licence clause.	Evidence to confirm that NSW Health has reviewed the change and is satisfied with the change.

Evidence sighted

See evidence for clause 2.2.3.

Summary of reason for grade

As noted under clause 2.2.3, Hunter Water sought NSW Health's satisfaction for changes to the RWQMPs. There is evidence of NSW Health's engagement with the process of updates to RWQMPs, however evidence was not seen that NSW Health had provided approval for these changes prior to implementation or undertaking of associated activities. This clause is considered high compliance.

Discussion and notes

In relation to notifying IPART of proposed significant changes, we were able to sight formal evidence of notification of proposed changes to IPART.[256] We note this was not in accordance with the reporting of significant changes in the Annual Performance Report to IPART[257], which states:

> *No significant changes to the recycled water quality management system were made during 2016-17*

NSW Health's 10 March 2017 letter to Hunter Water expressed satisfaction with the status of the review and update program for RWQMPs[258], rather than the current status of the RWQMPs as reported in the letter to IPART Report on Significant Changes.[256]

Recommendations

As this clause does not continue in Hunter Water's 2017-2022 operating licence, no recommendation has been made.

Opportunities for improvement

There are no opportunities for improvement as part of this clause.

[256] REPORT ON SIGNIFICANT CHANGES TO OPERATING LICENCE - HWC - Jim Bentley.pdf (31/3/17) and STATUS OF RECOMMENDATIONS-2015-16 OPERATIONAL AUDIT - HWC - Jim Bentley.pdf (31/3/17).
[257] Compliance and Performance report 2016-17.pdf
[258] 2.2.3 - NSW Health letter.pdf

Clause 4.1 – Asset Management System

Table B-14. Clause 4.1.1 compliance grade

Subclause	Requirement	Compliance grade
4.1.1	Hunter Water must maintain a Management System that is consistent with: a) the BSI PAS 55:2008 (PAS 55) Asset Management standard; or b) the Water Services Association of Australia's Aquamark benchmarking tool; or c) another asset management standard agreed to by IPART, (Asset Management System).	Full

Risk	Target for full compliance
Assets are poorly managed leading to higher costs and failure to meet required service levels.	An effective asset management system to an acceptable standard is in place

Evidence sighted

- Op_Audit 2016-17 - AMS overview presentation.pptx
- Operational Audit 2016-17 - Asset Management.pptx
- 4.1.1 - 1 - Report - Enterprise Asset Management Framework.DOC
- 4.1.1 - 10 - Reservoir Asset Class Management Plan.docx
- 4.1.1 - 11 - Report - CTGM Asset Management Plan FINAL.pdf
- 4.1.1 - 12 - Lifting Equipment Asset Class Management Plan - Draft.docx
- 4.1.1 - 13 - Pressure Vessels Asset Class Management Plan Draft.docx
- 4.1.1 - 14 - Asset Standard Management Plan.docx
- 4.1.1 - 15 - QG043 Capital Project Programs Guideline.docx
- 4.1.1 - 16 - QT005 Post Completion Review Report.docx
- 4.1.1 - 17 - QT102 Project Plan.docx
- 4.1.1 - 18 - QF028 Construction Site Daily Inspection Report.docx
- 4.1.1 - 2 - Plan - PDP - ISO55000 Prioritisation and Implementation Plan Development.DOCX
- 4.1.1 - 20 - Report - Lemon Tree Passage WTP Civil and Mechanical Condition Assessment - Rev 0.PDF
- 4.1.1 - 21 - Report - Boulder Bay WWTW Civil and Mechanical Condition Assessment - Rev 0.PDF
- 4.1.1 - 22 - Chichester Dam Safety Emergency Plan.pdf
- 4.1.1 - 3 - Report - ISO55001 Final draft Gap Analysis Report 30.03.15.DOC
- 4.1.1 - 4 - Policy - Signed Asset Management Policy Jun 2016.PDF
- 4.1.1 - 5 - File note - Asset Management System Steering Committee - Terms of Reference - 1.0.DOCX
- 4.1.1 - 6 - Procedure - CURRENT - Enterprise Risk Management Framework.PDF
- 4.1.1 - 7 - Standard - Managing Strategic Risks - CURRENT.DOCX
- 4.1.1 - 8 - Built Over Assets Risk Assessment Report Draft.docx
- 4.1.1 - 9 - WWPS Risk Assessment (REV4 - caution - CN P2).xlsm
- 4.1.1 - 19 - Capital Portfolio Management Guideline.doc

Summary of reason for grade

For the audit year 2016-17, Hunter Water had in place, and maintained, an asset management system that is consistent with the Water Services Association of Australia's Aquamark benchmarking tool. Hunter Water was actively transitioning to a system in accordance with the international standard *ISO 55001 Asset Management – Management systems – Requirements* during 2016-17 to meet its Operating Licence requirement.

Discussion and notes

Hunter Water manages its assets under its 2010 Asset Management Framework which Hunter Water considers is aligned with the Aquamark tool. Aquamark identifies business processes in seven categories:

1. Organisational management
2. Asset Capability and Forward Planning
3. Asset Acquisition
4. Asset Operation
5. Asset Maintenance
6. Asset Renewal
7. Asset Management Applications

The 2010 Framework details how these business areas are addressed. Organisational management is guided by Hunter Water's Strategic Business Plan and Corporate Management System. Asset Capability and Forward planning is guided by the Service Management and Asset Planning functions within the Framework. These functions plan for service provision (availability, quality and reliability) across Hunter Water's different product areas. The lifecycle functions (acquisition, operation, maintenance and renewal) are reflected in Hunter Water's own framework. Finally, Asset Management Applications maps to the Knowledge Management function within the 2010 framework.

This framework will not be in use for much longer and Hunter Water has turned its attention to using existing processes and artefacts within the framework to address the requirements of ISO 55001. We were provided with and reviewed two gap analyses (From 2015 and August 2017, the latter in summary only) Hunter Water has undertaken to identify the areas in which its current processes need to be strengthened to meet the obligations in the standard. We also reviewed the project plan and the intranet based workspace for the project used to provide information and resources to staff.

In 2016, Hunter Water participated in the Asset Management Customer Value (AMCV) process benchmarking project which is the successor of the earlier Aquamark benchmarking project. The AMCV is based around the same seven business process categories as before although there has been a change to a small proportion of the process questions, largely to capture the requirements of ISO 55001 within the benchmarking tool. The findings of this benchmarking exercise included that:

- Hunter Water is above the median level of maturity for all seven function areas when compared with Australian water utilities.
- Hunter Water was rated near the top of the cohort on the asset acquisition function when compared with Australian water utilities.
- Hunter Water has improved its scoring in the functions between 2012 and 2016.

Based on our review of Hunter Water's asset management framework and supporting information and the 2016 AMCV report , we conclude that for the audit year 2016-17, Hunter Water had in place, and maintained, an asset management system that is consistent with the Water Services Association of Australia's Aquamark benchmarking tool.

Recommendations

There are no recommendations in relation to this clause.

Opportunities for improvement

There are no opportunities for improvement in relation to this clause.

Clause 4.1.2

Table B-15. Clause 4.1.2 compliance grade

Subclause	Requirement	Compliance grade
4.1.5	Hunter Water must ensure that the Asset Management System is fully implemented and that all relevant activities are carried out in accordance with the system.	High

Risk	Target for full compliance
Assets being poorly managed leading to higher costs and failure to meet required service levels.	The Asset Management System at Clause 4.1.1 is effectively implemented across all asset classes and maintained.

Evidence sighted

- 4.1.2 - 1 - Compliance-and-Performance-report-2016-17[1].pdf
- 4.1.2 - 11 - Wangi Reservoir External Inspection.docx
- 4.1.2 - 12 - Safety Alert 92 - Accessing Reservoir Roofs.doc
- 4.1.2 - 13 - Standard - Electrical Safety.docx
- 4.1.2 - 14 - Manual - Safe Electrical Work.docx
- 4.1.2 - 15 - Manual - HV Installation Safety Management Plan.docx
- 4.1.2 - 16 - Standard - Maintenance Work Management.docx
- 4.1.2 - 17 - Standard - Management of Technical Change.docx
- 4.1.2 - 18 - Standard - Organisational change management.docx
- 4.1.2 - 19 - Veolia Treatment Operations Contract - Operational Management Plan.pdf
- 4.1.2 - 2 - Report - Hunter Water State of the Assets Report 2016 - as submitted to IPART.PDF
- 4.1.2 - 20 - Hunter Water 2017+3 Strategy.pdf
- 4.1.2 - 21 - AMCV-Industry Report 2016.pdf
- 4.1.2 - 22 - AMCV_Participant Report_Hunter Water Corporation - Final 2016.pdf
- 4.1.2 - 3 - File note - State of the Assets 2016 Summary.DOCX
- 4.1.2 - 4 - Report---Monthly-Drinking-Water-Quality-Summary---September-2017[1].pdf
- 4.1.2 - 5 - System Performance Dashboard Summary.docx
- 4.1.2 - 6 - Business Performance Report August 2017 - Final.pdf
- 4.1.2 - 7 - Report - ERC Sep 2016 Quarterly portfolio review.docx
- 4.1.2 - 8 - Working Paper - Quarterly Report Q4 Planning and Operations.docx
- 4.1.2 - 9 - Reservoir - Asset Class Management Plan.docx
- Mech-Elec Assets.pptx
- DQS0123_ChlorineLeakAlarmTesting.doc
- Environmental site inspection_010617_Elermore Vale Res.pdf
- HWC - PM Program Change Register.xlsx
- Kurri UV work orders_17nov17.xls.xlsx
- Letter - Payment Schedule and Performance Report for June 2016.PDF
- Work Instruction 010 – Stopping a Leaking Hydrant.docx
- 2004 Watermain Break Details at Myuna Bay AOMS 162791.docx
- 2015 Watermain prioritisation consequence table.pdf
- Asset Management Group Activities - June 2017.xlsx
- Consultant Report - HH2O - Reservoir Assessment Report - Elermore Vale 1 - Draft 06112017.PDF
- Consultant Report - HH2O - Reservoir Assessment Report - Elermore Vale 2 06112017.PDF
- Consultant Report - South Wallsend No1 Condition Report 2016).PDF
- Data - Reservoir PPP 2017 2021.XLS

- HW2013-421 6.005 Instruction - WI 5 - Hydrant Inspection, Marking and Painting - CURRENT (1).docx
- HW2013-421 6.005 Instruction - WI 5 - Hydrant Inspection, Marking and Painting - CURRENT.docx
- HWC audit - information request - Assets NWI Field Trip v0.1.xlsx
- IPART 2016-17 Audit Information Request Hydrant Question Summary.docx
- Op_Audit 2016-17 - AMS overview presentation.pptx
- Operational Audit 2016-17 - Asset Management.pptx
- Organisation Chart - Asset Management Group - June 2017.docx
- Register - Asset class plans.xlsx
- Report - RevA-Critical watermain prioritisation management strategy.PDF
- S09-3 4 5 5.001 Guideline - Asset Class Management Plan.DOC
- SCADA screen shot of Elermore Vale chlorinator showing chlorine drum weights.docx
- Watermain Myuna Bay Risk Profile.docx

Summary of reason for grade

Hunter Water is implementing the Asset Management System described at clause 4.1.1 as demonstrated by the evidence reviewed. A minor shortcoming is that Hunter Water's approach to asset criticality and risk assessment is not fully implemented or consistent across all asset classes.

Discussion and notes

This clause requires that Hunter Water fully implements the Asset Management System described at 4.1.1 and that all relevant activities are carried out in accordance with the system. To test this clause, we undertook a number of complementary audit activities, namely:

1. Review of a number of the business factors that support the system including leadership and resources.
2. Review of Hunter Water's asset management decision making in the following areas:
   i) Asset criticality and risk framework
   ii) Maintenance management
3. Consideration of the Myuna Bay water main burst and the lessons learned for asset management.
4. Visit to a number of operational sites.

The audit activities in the above areas were carried out considering the interrelationships between each and also the interrelationship with the other areas within the scope of this audit. We discuss each of these areas following:

Leadership and resources

Hunter Water published an updated asset management policy in June 2016. This policy commits the organisation to provide the resources necessary to meet the defined asset management objectives. The 2015 gap analysis of Hunter Water's alignment with ISO 55001 had flagged that resources may be a constraint in achieving alignment. We challenged Hunter Water to demonstrate that it has in place sufficient resources to fully implement the asset management system across its relevant activities. Hunter Water responded that the following are indicators that it has sufficient resources in place for implementing its asset management system:

- External procurement of operation and maintenance activities for treatment plants means that sufficient resources are needed to be provided to ensure that the performance requirements in the contract are met.
- An appropriate management structure is in place for asset management strategy and planning with defined accountability.
- A dedicated project team is in place to meet Hunter Water's licence obligation to align its asset management system with *ISO 55001*. This is progressively updating existing asset management processes and creating new processes if needed.

Hunter Water provided further evidence including the organisational structure for its asset management team and asset management activities planning schedule to demonstrate that it has sufficient resources in place to implement its system.

Asset criticality and risk framework

The 2014-15 audit recommended that Hunter Water implement initiatives in the area of asset criticality and condition assessment. Understanding asset criticality (consequence of failure) and condition (likelihood of failure) are important factors in sound asset management as they underpin risk based decision making. Risk based decision making is also a requirement of *ISO 55001*.

Hunter Water has in place an enterprise risk management framework. We witnessed during audit interviews the corporate risk summary dated October 2017. This includes 21 strategic risk profiles of which one was for failure of a critical asset. Hunter Water stated that a significant change has been moving away from an as low as reasonably practicable (ALARP) approach to managing strategic risk to defining risk appetites for different risks. These can be higher than ALARP although for critical assets, Hunter Water's risk appetite is low. Risk appetites are being progressively implemented, tested and refined.

We witnessed during audit interviews the asset risk methodology document. This is used to determine asset level risk profiles. Asset risk profiles have been prepared for the following asset classes:

- HV assets
- Stormwater
- Reservoirs
- Wastewater pump stations
- Pressure vessels

Water and sewer mains have previously had a criticality and risk assessment rating applied but this is being revised. Water pump stations are yet to be assessed. Criticality ratings for sewers are stored within GIS for individual pipe segments. At the audit interview, we witnessed the criticality ratings for two sewer mains – the first a 150mm cast iron sewer main and a 1065mm sewer main, both assigned high criticality. We challenged Hunter Water as to why the smaller diameter main was assigned a high criticality to which Hunter Water responded that this was due to the material type. This does not align with a typical approach to assessing asset criticality which should focus on the impact on service delivered. However, we understand that Hunter Water is in the process of revising its criticality methodology for all mains.

The previously completed asset criticality and risk assessment for water mains was felt to overstate the risk associated with failure of these assets primarily because failure rates in the assessment were higher than actually encountered. Hunter Water stated that it uses hydraulic modelling to identify impacted populations where possible but noted that modelling is limited by the data available and events modelled and cannot consider every eventuality.

Hunter Water had previously defined assets as critical or non-critical but found that more granularity was needed for decision making so has introduced a super-criticality category. The assets in this category potentially have a very large business impact and include dams, HV assets and ocean outfalls.

To test Hunter Water's understanding and implementation of asset criticality and critical spares management, we queried what critical spares were held for the Wallsend water pump station which we visited as part of the audit. Hunter Water advised that while this site in its entirety was important to service delivery, there are three separate power supplies into the site and there is multiple redundancy because of the duty-standby-assist configuration across the six 220 kW pump sets. As a result, no critical spares are held on site for these assets. This is an appropriate approach to managing these assets.

Maintenance management

Maintenance management was identified as an area of opportunity in the 2012 Aquamark report and Hunter Water has accordingly sought to improve in this area. Previous audit reports (2013-14 and 2014-15) also recommended that Hunter Water:

- develop a holistic approach to asset maintenance
- complete capture of all asset and related maintenance information in its Ellipse Asset/ Maintenance Management System

These maintenance related recommendations were still open at the time of this audit.

An opening for change arose as Hunter Water retendered for the operation of its treatment plants (from 1 July 2014) with the contract scope widened to include maintenance of the plants as well. This includes both planned and preventive maintenance. In the time since the commencement of this contract, maintenance management improvement initiatives have included:

- defining planned maintenance procedures for all relevant activities
- reviewing critical spares
- improving maintenance activity creation for new assets

Hunter Water provided to us the monthly performance report and payment claim for the contract dated 3 August 2016. This shows that the contractor is meeting the performance requirements for maintenance and no Service Standard Adjustments were made. Hunter Water stated that it is continually improving its maintenance approach through this contract. We asked Hunter Water to provide evidence of the improvements to maintenance to which Hunter Water responded with a schedule detailing the changes made in moving from the initial revision of the maintenance procedures to the next revisions. The schedule (HWC – PM Program Change Register.xlsx) details 309 issues that were raised and whether the issues raised resulted in a change to practice. 275 of the 309 issues (89%) have been recorded as being completely addressed.

At the audit interview and following the audit we reviewed work orders for maintenance activities including:

- Burwood WWTW – six monthly planned maintenance for UV bank 2D
- Burwood WWTW - Crane inspection
- Kurri Kurri WWTW – reactive maintenance for the UV plant which included replacement of lamps, wipers and quartz sleeves
- Kurri Kurri WWTW – all work orders associated with the UV plant. There were 46 work orders for 2016-2017 of which 27 were planned maintenance activities. The remaining 19 were breakdown, planned corrective or replacement activities. Around $5k was spent on preventive maintenance and $16k on breakdown, planned corrective or replacement activities during the year
- Four Mile Creek Chlorinator – chlorine system inspection. The description of how chlorine drum weights is communicated was found to be out of date and to refer to a non-current procedure (DQS0123)

Hunter Water conducted a productivity review of its maintenance function for its non-treatment (i.e. network, civil, mechanical and electrical) maintenance activities which identified improvement including the opportunity to improve planning and scheduling of maintenance in these areas. As a consequence, Hunter Water has put in place a planning and scheduling team for civil planned maintenance. We met with this team during the audit interviews and witnessed their forward planning and scheduling. The team's focus is on driving down the number of outstanding low priority planned maintenance jobs (e.g. small leaks). The team showed strong awareness of maximising utilisation of resources, the need to address outstanding issues and the performance expected of their functional area.

Based on our audit activities including review of information systems and supporting documentation, we consider that Hunter Water has addressed the requirements of

Recommendation 2013/14-20:5.2.4 that Hunter Water should continue implementing initiatives including:

- develop a holistic approach to asset maintenance
- the complete capture of all asset and related maintenance information in its Ellipse Asset/ Maintenance Management System

Based on the out of date planned maintenance work instructions identified and the outstanding part of Recommendation 2014/15-03, we have made a new recommendation in this area.

Myuna Bay main burst

In February 2017 a water main burst in Myuna Bay impacted more than 5,000 properties for more than five hours. This event was a key reason why Hunter Water did not meet its system performance standard to ensure that no more than 10,000 properties experience an unplanned water interruption lasting more than five hours in the reporting year. The total number of properties impacted across the entire network during the year was 10,144. The Myuna Bay event therefore accounts for around half of the total.

We queried Hunter Water as to what lessons had been learned from this event for the management of its assets. Hunter Water responded that the severity of this event was in large part due to the time it took to identify the failure and then locate the site of the failure. The first warning was a reservoir low level alarm as the system drained. As no public report of the main failure had been made, the burst location had to be located through inspection. This took some time as the area is relatively sparsely populated and the main is located away from the road near a wetland. Hunter Water considers that it can improve how it identifies and respond to events in similar circumstances in future.

We queried as to the assessed criticality and risk of failure of this main. Hunter Water responded that the main was assessed as part of a Watermain Risk Prioritisation project as a Medium Risk based on an Extreme consequence assigned to relative financial costs (based on pipe size, >=DN375) and a Rare likelihood. Hunter Water notes that this risk ranking was a prioritisation tool and this element does not align to the corporate risk framework. The consequence of failure to water continuity was assessed as an insignificant consequence based on modelling results suggesting that <2,000 properties would be impacted for less than 5 hours and the corresponding risk rating was low. The February 2017 event would have corresponded to a 'medium' consequence of failure under the corporate risk framework as more properties were impacted. Hunter Water states that the actual magnitude of this event would have been unlikely to have been able to be predicted in advance given that modelling of failure of the main suggested many fewer properties would be impacted.

Hunter Water advised that a nearby section of main had burst in 2004 impacting two properties. We reviewed the work order information for this event.

That the actual consequence of this event was higher than originally assessed is likely a reflection of the difficulty in modelling system performance rather than deficiencies in Hunter Water's approach to assessing asset criticality. It does however highlight the need to continually improve where new information becomes available.

Recommendations

Recommendation 4.1.2-1: By 30 June 2019 Hunter Water should fully implement an asset criticality and risk assessment approach that is consistent across all asset classes and consistent with the enterprise risk management framework.

Recommendation 4.1.2-2: We recommend that Hunter Water reviews the currency of all planned maintenance work instructions (for all assets) and prepares a program to update these as required over a period in accordance with its document control standard. The program should be prepared by the end of December 2018.

Opportunities for improvement

There are no opportunities for improvement for this clause.

Clause 4.1.3

Table B-16. Clause 4.1.3 compliance grade

Subclause	Requirement	Compliance grade
4.1.5	Hunter Water must notify IPART of any significant changes that it proposes to make to the Asset Management System in accordance with the Reporting Manual.	Full

Risk	Target for full compliance
Assets are poorly managed leading to higher costs and failure to meet required service levels.	Hunter Water notifies IPART when any significant changes to its Asset Management System are proposed

Evidence sighted

- Compliance and Performance Report 2016-2017
- 4.1.1 - 2 - Plan - PDP - ISO 55000 Prioritisation and Implementation Plan Development
- 4.1.1 - 3 - Report - ISO 55001 Final draft Gap Analysis Report 30.03.15

Summary of reason for grade

Hunter Water has provided notification of the proposed changes to its Asset Management System through the Compliance and Performance Report.

Discussion and notes

Hunter Water is proposing, and progressing, changes to its Asset Management System to meet the obligation in its new Operating Licence (2017-2022) which requires Hunter Water to develop a System compliant with the international standard *ISO 55001 Asset Management – Management systems – Requirements* by 31 December 2017.

During audit interviews we reviewed a gap analysis report and Project Development Plan for the progression of the ISO 55001 aligned Asset Management System.

Recommendations

There are no recommendations in relation to this clause.

Opportunities for improvement

There are no opportunities for improvement in relation to this clause.

Clause 6.1 – Environmental Management

Clause 6.1.1

Table B-17. Clause 6.1.1 compliance grade

Subclause	Requirement	Compliance grade
6.1.1	By 30 June 2017, Hunter Water must develop a Management System which is consistent with the Australian Standard *AS/NZS ISO 14001:2004*: Environmental Management Systems - Requirements with guidance for use (Environmental Management System).	Full

Risk	Target for full compliance
Not having developed an environmental management system, consistent with *AS/NZS ISO 14001:2004* and in the required time frame, would mean a risk of non-compliance with the operating licence.	An environmental system that has been developed to the requirements *of AS/NZS 14001:2004* by 30 June 2017.

Evidence sighted

- Interviews with Senior Environmental Planner, Environment & Sustainability Manager and IMS Manager
- 6.1.1 - Document A - Certificate - HWC Certified to ISO 140012004 _ issued 22102014_ expires 22102017.PDF
- 6.1.1 - Document B - Hunter Water Corporation_Re-certification and Transition Audit_Management_Summary_Report Aug 2017.docx
- 6.1.1 - Document C - Hunter Water Corporation_Re-certification and Transition Audit Report Aug 2017.xlsx
- 6.1.1 - Document X - ISO 14001 Certification Audit - 29th Sep - 1st Oct 2014 - Audit Findings.xlsx
- 6.1.1 - Document Y - ISO 14001 Certification Audit - 29th Sep-1st Oct 2014 - Summary Audit Report.doc

Summary of reason for grade

Hunter Water's environmental management system achieved certification to *ISO 14001:2004* in 2014 and therefore, is compliant with clause 6.1.1 as it developed an environmental management system before the due date of 30 June 2017. The re-certification audit report confirms compliance with the 2004 standard for the audit date scope.

Discussion and notes

Hunter Water's system was certified to *AS/NZS ISO 14001:2004* on 22 October 2014. Hunter Water provided evidence[259] to support the certification. IPART's instructions to the auditors were to check certification and the external audit report. We confirmed the standard certified to and the period of certification of the certificate issued by DNV-GL.[260] Hunter Water also provided us with a copy of the re-certification audit report, the scope of certification being:

> *"Provide, construct, operate, manage and maintain efficient, coordinated and commercially viable systems and services for supplying drinking and recycled water, providing sewerage and stormwater services and disposing of wastewater throughout its area of operations under an Operating Licence granted by the NSW Government."*

[259] 6.1.1 - Document A - Certificate - HWC Certified to ISO 140012004 _ issued 22102014_ expires 22102017.PDF; 6.1.1 - Document X - ISO 14001 Certification Audit - 29th Sep - 1st Oct 2014 - Audit Findings.xlsx; 6.1.1 - Document Y - ISO 14001 Certification Audit - 29th Sep-1st Oct 2014 - Summary Audit Report.doc

[260] AS/NZS ISO 14001 :2004, 22 October 2014 to 22 October 2017.

Hunter Water achieved certification to *ISO 14001:2004* in 2014 and therefore, is compliant with clause 6.1.1 as it developed an environmental management system before the due date of 30 June 2017. The re-certification audit report confirms compliance with the 2004 standard for the audit date scope.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

Clause 6.1.2

Table B-18. Clause 6.1.2 compliance grade

Subclause	Requirement	Compliance grade
6.1.2	Hunter Water must ensure that: a) by 30 June 2017, the Environmental Management System is certified by an appropriately qualified third party to be consistent with the Australian Standard AS/NZS ISO 14001:2004: Environmental Management Systems - Requirements with guidance for use; and b) once the Environmental Management System is certified under condition 6.1.2(a), the certification is maintained during the remaining term of this Licence.	Full

Risk	Target for full compliance
Not having had the environmental management system certified by an appropriately qualified third party and maintaining it, could mean a major risk of breach of this licence clause.	An environmental system that has been certified to the requirements of AS/NZS 14001:2004 by 30 June 2017 by an appropriately qualified third party. That the certified system is maintained for the remaining period of the operating licence.

Evidence sighted

- Interviews with Senior Environmental Planner, Environment & Sustainability Manager and IMS Manager
- 6.1.2 - Doc AA - Integrated Surveillance Audit - ISO 14001 and AS 4801 - 8 -10 Dec 2014 - Audit Findings.xls
- 6.1.2 - Doc AB - IMS Audit - Certification ISO 9001 and Surveillance 14001 4801 - 27-31 July 2015 - Audit Findings.xls
- 6.1.2 - Doc AC - Integrated Management System - Surveillance Audit WHS Env Quality - 30th Nov to 2 Dec 2015 - Audit Findings.xls
- 6.1.2 - Doc AD - Integrated Management System - Surveillance WHS Env Quality - May 2016 - Audit Findings.xls
- 6.1.2 - Doc AE - IMS Audit - Recertification AS 4801 surveillance QMS and Env - November 2016 - Audit Findings.xlsx
- 6.1.2 - Doc AF - IMS Audit - Transition ISO 9001 2015 and surveillance WHS and Env - May 2017 - Audit Findings.xlsx
- 6.1.2 - Document A - Certificate - HWC Certified to ISO 140012004 issued 22102014 expires 22102017.PDF
- 6.1.2 - Document B - Hunter Water Corporation Recertification and Transition Audit Management Summary Report Aug 2017.docx

- 6.1.2 - Document C - Hunter Water Corporation Recertification and Transition Audit Report Aug 2017.xlsx
- 6.1.2 - Document X - ISO 14001 Certification Audit - 29th Sep - 1st Oct 2014 - Audit Findings.xlsx
- 6.1.2 - Document Y - ISO 14001 Certification Audit - 29th Sep-1st Oct 2014 - Summary Audit Report.doc

Summary of reason for grade

Hunter Water supplied evidence to confirm that its Environmental Management System was certified by a reputable third party certifier, to meet the requirements of *AS/NZS 14001:2004*. Hunter Water also provided evidence to show that ongoing certification and surveillance audits had been undertaken since certification with two of the audits having occurred in the audit date scope. The most significant of the audit findings was 'minor'[261] and in fact there were several findings of 'noteworthy effort'. The commitment to ongoing audits and the standard of the findings shows that the system has been maintained since certification.

Discussion and notes

As noted in clause 6.1.1, Hunter Water's system was certified *to AS/NZS ISO 14001:2004* on 22 October 2014 and Hunter Water provided evidence[262] to support the certification by the company DNV-GL. IPART's instructions to the auditors were to check that certification has been maintained and the external audit report.

The third party certifier used by Hunter Water, DNV-GL, is a reputable and appropriately qualified company.[263]

The certification observed during assessment of clause 6.1.1 confirms the certification period of 22 October 2014 to 22 October 2017. The latest re-certification audit confirmed that Hunter Water remains in compliance with the 2004 standard.

Hunter Water is transitioning to the new standard – *AS/NZS ISO 14001:2016*[264] and the re-certification audit also looked at Hunter Water's transition to the new standard. We note that a small number of minor non-conformances[265] were found in the re-certification audit (for Focus Area 1, Status of *ISO 14001* Transition), however, it was noted that most of the key elements to the new standard have been adequately addressed and in any event, the non-conformances are of a minor[266] nature.

The certification body noted that:

> *"Except for the nonconformities listed in the List of findings, the management system was found to be effective and in compliance with the standard, based on the audit sample taken."*

---

[261] Minor non-conformances are described as something that does not affect the capability of the management system to achieve the intended results.

[262] 6.1.1 - Document A - Certificate - HWC Certified to ISO 140012004 _ issued 22102014_ expires 22102017.PDF; 6.1.1 - Document X - ISO 14001 Certification Audit - 29th Sep - 1st Oct 2014 - Audit Findings.xlsx; 6.1.1 - Document Y - ISO 14001 Certification Audit - 29th Sep-1st Oct 2014 - Summary Audit Report.doc

[263] Originally formed in 1864, as Det Norske Veritas. We confirmed DNV-GL 'active status' on the JAS-ANZ register http://www.jas-anz.org/our-directory/certified-organisations?combine=&country%5B%5D=Australia&location=Sydney&standard%5B%5D=AS%2FNZS+ISO+14001%3A2004&scope=&accredited_body=All 30/10/17. JAS-ANZ approval means that DNV-GL has been approved by an independent third-party as a professional body that acts with integrity when certifying or inspecting for conformity assessment.

[264] ISO 14001:2015.

[265] Stakeholder identification, comprehensive system audits for the environmental management system and evidence of key process training and competencies.

[266] Minor non-conformances are described as something that does not affect the capability of the management system to achieve the intended results.

Hunter Water stated that it is on track to address the non-conformances and achieve certification to the new standard before the end of the year (2017).

With regard to the 2004 standard, Hunter Water provided evidence to support the implementation of periodic surveillance audits (Table B-19), also conducted by DNV-GL. This information was reviewed and we confirmed that audits have been ongoing since certification in October 2014, with two of the audits having occurred within the audit date scope for this operational audit. For all the audit reports reviewed, there was no finding above a 'minor' classification and in fact there were several findings of 'noteworthy effort'. The commitment to ongoing audits and the standard of the findings shows that the system has been maintained since certification.

Table B-19. Dates of DNV-GL periodic audits.

Date	Audit Type	Within Audit Date Scope?
29 September 2014 to 1 October 2014[267]	Certification Audit	No
8 to 10 December 2014[268]	Integrated Surveillance Audit	No
27 to 31 July 2015[269]	Integrated Management System Audit	No
30 November to 2 December 2015[270]	Integrated Management System Surveillance Audit	No
25 May 2016[271]	Integrated Management System Surveillance Audit (includes transition to *ISO 9001:2015* standard in the audit)	No
4 November 2016[272]	Integrated Management System Surveillance Audit	Yes
5 May 2017[273]	Integrated Management System Surveillance Audit and Transition to *ISO 14001:2015*	Yes
31 August 2017[274]	Recertification and Transition Audit (for *ISO 14001:2015*)	No

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

[267] 6.1.1 - Document X - ISO 14001 Certification Audit - 29th Sep - 1st Oct 2014 - Audit Findings.xlsx; 6.1.1 - Document Y - ISO 14001 Certification Audit - 29th Sep-1st Oct 2014 - Summary Audit Report.doc.
[268] 6.1.2 - Doc AA - Integrated Surveillance Audit - ISO 14001 & AS 4801 - 8 -10 Dec 2014 - Audit Findings.xls
[269] 6.1.2 - Doc AB - Integrated Management System Audit - Certification ISO 9001 & Surveillance 14001 and 4801 - 27-31 July 2015 - Audit Findings.xls
[270] 6.1.2 - Doc AC - Integrated Management System - Surveillance Audit WHS, Env, Quality - 30th Nov to 2 Dec 2015 - Audit Findings.xls
[271] 6.1.2 - Doc AD - Integrated Management System - Surveillance WHS, Env, Quality - May 2016 - Audit Findings.xls.
[272] 6.1.2 - Doc AE - Integrated Management System Audit - Re-cert AS 4801_surveillance QMS and Env - November 2016 - Audit Findings.xlsx.
[273] 6.1.2 - Doc AF - Integrated Management System Audit - Transition ISO 9001_2015 and surveillance WHS & Env - May 2017 - Audit Findings.xlsx.
[274] 6.1.2 - Document B - Hunter Water Corporation Re-certification and Transition Audit Management Summary Report Aug 2017; 6.1.2 - Document C - Hunter Water Corporation Re-certification and Transition Audit Report Aug 2017.

Clause 6.1.3

Table B-20. Clause 6.1.3 compliance grade

Subclause	Requirement	Compliance grade
6.1.3	Hunter Water must ensure that by 30 June 2017, the Environment Management System is fully implemented and that all relevant activities are carried out in accordance with the system	High

Risk	Target for full compliance
Having a system in place but not fully implementing it, may mean that environmental risks that are thought to be managed, are not in practice.	An Environmental Management System, meeting the requirements of *AS/NZS 14001:2004* that has been implemented according to the stated requirements, by 30 June 2017.

Evidence sighted

- Interviews with Senior Environmental Planner, Environment and Sustainability Manager and IMS Manager
- Site inspections
- 6.1.3 - Business Continuity Management.jpg
- 6.1.3 - Dam and Catchment Emergency Management.jpg
- 6.1.3 - Document D - Screenshot_EMS_Entry_Screen.jpg
- 6.1.3 - Document E - Register - ER0024 - Document Register - CURRENT.XLS
- 6.1.3 - Document F - Register - ER0079 - EMS Records Register - CURRENT.XLS
- 6.1.3 - Document G - Policy - EP0004 - Community and Environment Policy - CURRENT - SIGNED.PDF
- 6.1.3 - Document H - Register - Environmental Aspects and Risk Register - 2017 - CURRENT.XLSX
- 6.1.3 - Document I - Register - Environmental Aspects and Risk Register 2017- Site Specific Risk Assessments - CURRENT.XLSX
- 6.1.3 - Document J - Procedure - EP0037 Communication and Reporting - CURRENT.DOC
- 6.1.3 - Document K - Register - Interested Parties for QMS, EMS June 2017.DOCX
- 6.1.3 - Document L - Register - ER0014 Compliance Obligations Register - CURRENT.DOCX
- 6.1.3 - Document M - Report - Pre-Reading for Management System Review Meeting _ 13 December 2016.DOC
- 6.1.3 - Document N - Agenda - Management Systems Review Meeting - Dec 2016.DOCX
- 6.1.3 - Document O - Minutes - Integrated Management System Review Meeting 13 December 2016.DOCX
- 6.1.3 - Document P - Template - ET0017 Exempt Development Checklist - CURRENT.DOC
- 6.1.3 - Document Q - Guideline - EG0041 Review of Environmental Factors Guidance Notes - CURRENT.DOC
- 6.1.3 - Document R - Template - ET0022 Review of Environmental Factors (REF) Template Minor Works - CURRENT.DOC
- 6.1.3 - Document S - Template - ET0021 Greenslip Template - CURRENT.DOCX
- 6.1.3 - Document T - Checklist - ET0102 - Review of Environmental Factors Checklist.DOCX
- 6.1.3 - Document U - Template - ET0020 Project Change Assessment Form - CURRENT.DOC
- 6.1.3 - Document V - Guideline - EG0118-Environmental Field Reference Guide.PDF
- 6.1.3 - Document W - Business Resilience Framework.docx
- 6.1.3 - Emergency Management Screenshot - Intranet Entry Point.jpg
- 6.1.3 - General Emergency Management Screenshot.jpg
- 6.1.3 - Guideline - EF0057 Reportable Environmental Incidents Fact Sheet - CURRENT.DOC
- 6.1.3 - Guideline - EG0028 Environmental Incident Water Sampling Guidelines - CURRENT.DOC

- 6.1.3 - Guideline - EG0111 Major Environmental Incidents - Checklist and Contacts for Support.DOCX
- 6.1.3 - Plan - EP0083 - Branxton Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0084 - Clarence Town Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0085 - Dungog Water Treatment Plant PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0086 - Dungog Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0087 - Karuah Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0088 - Kearsley Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0089 - Kurri Kurri Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0090 - Paxton Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0091 - Tanilba Bay Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0092 - Balickera Canal PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0094 - Raymond Terrace Wastewater Treatment Works PIRMP - CURRENT.DOCX
- 6.1.3 - Plan - EP0095 - Morpeth Wastewater Treatment Works PIRMP - Current.DOCX
- 6.1.3 - Plan - EP0098 - Boulder Bay Wastewater Treatment Works PIRMP - Current.DOCX
- 6.1.3 - Plan - EP0099 - Lake Macquarie Sewerage System PIRMP - Current.DOCX
- 6.1.3 - Plan - EP0100 - Newcastle Sewerage System PIRMP - Current.DOCX
- 6.1.3 - Procedure - EP0056 Environmental Incident Notification and Reporting - CURRENT.DOCX
- 6.1.3 - Procedure - EP0114 - Pollution Incident Response Management Plan Testing and Review Procedure.DOCX
- 6.1.3 - Register - ER0059 Environmental reporting contacts register - Network Operations - CURRENT.DOCX
- 6.1.3 - Register - ER0060 Environmental reporting contacts register - Capital Works - CURRENT.DOC
- 6.1.3 - Security Incident Emergency Management.jpg
- 6.1.3 - Template - ET0026 - Environmental Incident Report - Updated by Network Ops - CURRENT.DOCX
- 6.1.3 - Treatment Plant Emergency Management.jpg
- 6.1.3 - Wastewater network emergency management.jpg
- 6.1.3 - Water Network Emergency.jpg
- 6.1.3 -Guideline - EF0058 Frequently Asked Questions - Environmental Incidents - Fact Sheet - CURRENT.DOCHunter Water Compliance and Performance Report September 2017.pdf
- Certificate - HWC Certified to ISO 140012015 _ issued 22102014_ expires 20102020.PDF
- Email - site inspection schedule V2.1 HWC_VWA.XLSX
- Environment Management Plan.PDF
- Environmental site inspection_010617_Elermore Vale Res.pdf
- Greenslip approval.png
- gresford chemical bund - integrum.pdf
- HW2006-2014 16.010 Letter - Response to EPA - Dungog WTP.PDF
- HW2012-1503 8 11.006 Email - Waste water Treatment and transportation(3).PDF
- HW2014-778 13 12.018 Report - Gresford WTP Environmental Inspection - April 2017.PDF
- HW2014-778 13 9.051 Email - File Note Inspection of Kurri WWTW 29 November 2016.DOCX
- HW2015-463 2 13.191 Report - Environmental Inspection_Burwood UV_AD 20170119.DOCX
- HW2016-222 3.006 Approval - Tanilba Bay WWTW Upgrade - Environmental Green Slip.DOCX
- kurri - integrum.pdf
- Procedure EP0115 - Quality Assurance and Control - EPA Annual Licensing Returns.docx
- Report - Bushfire Threat Assessment - South Wallsend Reservoir and Chlorinator.PDF
- Report - EMT Environment Report for Oct 16 - Oct 2016.docx
- Report - EMT Environment Report_June 2017 - June 2017.docx
- Schedule - ER0054 - Depot and work site environmental inspection schedule.xls
- Screenshot showing regular updating of commitment tracker.png

- WRAPP Plan.png

Summary of reason for grade

Hunter Water supplied a wide range of evidence showing implementation across a number of areas of the Environmental Management System. It was also noted that a number of improvements were implemented in the audit period, including electronic environmental inspection reports and ongoing updating and review of documentation. A few minor shortcomings were noted in relation to training of operational and maintenance staff in environmental issues during maintenance and inspection activities, with two environmental issues not having been picked up in implementation of the annual reservoir inspection checklists for the Elermore Vale Reservoir site. The current schedule of environmental inspections of higher risk sites may mean that some lower risk areas are being missed with the flow-on potential to miss environmental impacts that may escalate. We have included recommendations relating to the training and revision of the environmental inspection schedule scope.

Discussion and notes

Clause 6.1.3 requires Hunter Water, by 30 June 2017, to ensure that the Environment Management System is fully implemented and that all relevant activities are carried out in accordance with the system. Additional guidance provided by IPART was that the system had been certified on 22nd October 2014 and for the auditors to check implementation.

Accessibility to the EMS via Hunter Water's intranet was sighted by the auditors during the audit interview.[275] The EMS is comprised of an Environmental Policy[276], Environmental Management Plans, procedures, guidelines, forms, environmental work method statements and registers, with a register of documents provided as evidence of the scope of documents available to staff. [277] Document control of the EMS is undertaken through Integrum. We sighted the Waste Reduction and Purchasing Policy for currency in Integrum, and confirmed that a review of the document had been undertaken in July 2016 as scheduled.

The 2013-17 Environment Management Plan outlines Hunter Water's environmental objectives, actions and targets.[278] The plan has eleven goals, which are reported on in the Annual Environmental Compliance and Performance Report.[279]

Hunter Water provided evidence of consideration of environmental risk through the impact and aspects risk registers.[280] Evidence of workshop participants is not included in the register, however a separate pdf copy of a sign in sheet for an April 2017 wastewater workshop was provided. It was noted however that no one from Veolia was present at the wastewater workshop.[281]

Proposed treatments are tracked through the Environmental Commitments Tracking Register. Commitments are managed with monthly updates sent to appropriate personnel to update, with tracking progressed through the comment section of the register. Evidence of updates was provided from document control version tracking.[282]

Hunter Water capital works are managed by the Asset Creation Framework. All Hunter Water projects involving construction or planned maintenance require assessment of environmental risks

[275] 6.1.3 - Document D – Screenshot EMS Entry Screen.jpg

[276] 6.1.3 - Document G - Policy - EP0004 - Community and Environment Policy - CURRENT – SIGNED.PDF

[277] 6.1.3 - Document E - Register - ER0024 - Document Register – CURRENT.xls

[278] Environment Management Plan.pdf

[279] Hunter Water Compliance and Performance Report September 2017.

[280] 6.1.3 - Document H - Register - Environmental Aspects and Risk Register - 2017 – CURRENT.XLS; 6.1.3 - Document I - Register - Environmental Aspects and Risk Register 2017- Site Specific Risk Assessments – CURRENT.XLS

[281] HW2012-1503 8 11.006 Email - Waste water Treatment and transportation(3).pdf

[282] Screenshot showing regular updating of commitment tracker.png

to determine whether they shall require an environmental impact assessment and planning approvals, or other approvals. If not exempt development a Review of Environmental Factors (REF) is completed to identify risks and hazards. Evidence was provided of a REF checklist, template for minor works and guidance notes.[283] An Environmental Green Slip is used if Hunter Water is approving the project which details any conditions of approval. Evidence was provided of the Environmental Green Slip template document and an example of a completed checklist with conditions for Tanilba Bay WWTW Upgrade and the approvals of the checklist through the HP Records Manager system.[284]

Hunter Water noted that for large or high risk projects, an environmental management representative (EMR) is appointed. Evidence was provided of a Capital Works Environmental Inspection checklist undertaken by an EMR inspection checklist for Burwood UV, including evidence of tracking of actions from the previous inspection.[285]

Hunter Water noted that internal staff repairing or constructing assets have a range of environmental work method statements and procedures that they are required to follow. Evidence was provided of the field guide that covers common environmental issues associated with their work.[286]

Hunter Water provided evidence of a range of emergency environmental incidents and response frameworks, guidelines, procedures, registers and templates.[287] Pollution Incident Response Management Plants were provided for Braxton, Clarence Town, Dungog, Karuah, Kearsley, Kurri Kurri, Paxton, Tanilba Bay, Raymond Terrace, Morpeth, Farley, Cessnock and Boulder Bay WWTWs, and Balickera Canal, and Lake Macquarie and Newcastle Sewerage Systems.[288]

Hunter Water provided evidence of EMT environmental monthly reports for October 2016 and June 2017, detailing a summary of notifiable incidents, including the date of each incident, date reported to the EPA, details of the incident and learnings.[289]

---

[283] 6.1.3 - Document Q - Guideline - EG0041 Review of Environmental Factors Guidance Notes – CURRENT>DOC
6.1.3 - Document R - Template - ET0022 Review of Environmental Factors (REF) Template Minor Works – CURRENT.DOC, 6.1.3 - Document T - Checklist - ET0102 - Review of Environmental Factors Checklist [Due diligence checklist].DOCX

[284] HW2016-222 3.006 Approval - Tanilba Bay WWTW Upgrade - Environmental Green Slip.docx; Greenslip approval.png

[285] HW2015-463 2 13.191 Report - Environmental Inspection_Burwood UV_AD 20170119.docs

[286] 6.1.3 - Document V - Guideline - EG0118-Environmental Field Reference Guide.PDF

[287] 6.1.3 - Guideline - EF0057 Reportable Environmental Incidents Fact Sheet – CURRENT.DOC; 6.1.3 - Guideline - EG0028 Environmental Incident Water Sampling Guidelines – CURRENT.DOC; 6.1.3 - Guideline - EG0111 Major Environmental Incidents - Checklist and Contacts for Support.DOCX; 6.1.3 - Procedure - EP0056 Environmental Incident Notification and Reporting – CURRENT.DOCX; 6.1.3 - Procedure - EP0114 - Pollution Incident Response Management Plan Testing and Review Procedure.DOCX; 6.1.3 - Register - ER0059 Environmental reporting contacts register - Network Operations – CURRENT.DOCX; 6.1.3 - Register - ER0060 Environmental reporting contacts register - Capital Works – CURRENT.DOC; 6.1.3 - Template - ET0026 - Environmental Incident Report - Updated by Network Ops – CURRENT.DOCX; 6.1.3 -Guideline - EF0058 Frequently Asked Questions - Environmental Incidents - Fact Sheet – CURRENT.DOC

[288] 6.1.3 - Plan - EP0083 - Branxton Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0084 - Clarence Town Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0085 - Dungog Water Treatment Plant PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0086 - Dungog Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0087 - Karuah Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0088 - Kearsley Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0089 - Kurri Kurri Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0090 - Paxton Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0091 - Tanilba Bay Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0092 - Balickera Canal PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0094 - Raymond Terrace Wastewater Treatment Works PIRMP – CURRENT.DOCX; 6.1.3 - Plan - EP0095 - Morpeth Wastewater Treatment Works PIRMP – Current.DOCX; 6.1.3 - Plan - EP0096 - Farley Wastewater Treatment Works PIRMP – Current.DOCX; 6.1.3 - Plan - EP0097 - Cessnock Wastewater Treatment Works PIRMP – Current.DOCX; 6.1.3 - Plan - EP0098 - Boulder Bay Wastewater Treatment Works PIRMP – Current.DOCX; 6.1.3 - Plan - EP0099 - Lake Macquarie Sewerage System PIRMP – Current.DOCX; 6.1.3 - Plan - EP0100 - Newcastle Sewerage System PIRMP – Current.DOCX

[289] Report - EMT Environment Report for Oct 16 - Oct 2016.docx; Report - EMT Environment Report_June 2017 - June 2017.docx

Hunter Water noted that during a site inspection of Dungog WTP with the EPA in May 2017 that alum was leaking on site. Hunter Water provided evidence of its response to the EPA[290] confirming that it has a routine inspection program for the Dungog WTP and undertakes site inspections regularly. Hunter Water provided to the auditors evidence of an audit inspection schedule.[291]

Hunter Water noted that inspections are undertaken for high risk sites and provided evidence of a schedule of inspections. During the audit scope the format of the environmental inspection reports was upgraded to an electronic system. Evidence was provided of completed checklists for Elermore Vale Chlorinator, Kurri Kurri WWTW and Gresford WTP.[292] We sighted the Gresford WTP environmental inspection report[293] and tracked an action resulting from the inspection report in Integrum.[294] It was noted that while the action and reference in Integrum matched the inspection report, a different report had been attached due to an incorrect naming of the file.

During the audit site visit to Elermore Vale reservoir, a number of spray cans and paint material littered the site (noted to have been brought in by third parties), as well as two stormwater pits that were overgrown with vegetation and filled with water. An environmental inspection report was provided for the chlorinator site, which while not specifically covering the reservoirs noted the litter on site, but did not include the overgrown vegetation and ponding and included no action around the litter. An annual reservoir inspection report for the site, undertaken by operations and maintenance staff, included categories for litter and stormwater drains, but the issues had not been identified or any actions noted for these areas. It was also noted on site that vegetation was within the buffer zone recommended in the bushfire assessment of the area. No evidence was provided for how the bushfire zone recommendations have been tracked through asset management

During the site inspection of Gresford WTP and water pumping station, we noted some erosion of the pathway leading down to the extraction point which may present a minor environmental issue in terms of sediment generation. An environment inspection report of the Gresford WTP site was carried out in April 2017 but did not cover the water pumping station site even though it was within close proximity to the plant.

Recommendations

Recommendation 6.1.3-1: By 30 September 2018, refresher training of operations and maintenance staff should be conducted for annual inspections and maintenance activities. In particular, there should be a focus on identifying environmental impacts and ensuring mitigation of any impacts noted.

Recommendation 6.1.3-2: By 30 September 2018, the schedule of environmental inspections should be reviewed and expanded where relevant to include the following: if inspecting a high risk site (e.g. chlorinator or WTP) that is in close proximity to a lower risk site (e.g. reservoir or water pumping station) the lower risk site should also be included in the inspection.

Opportunities for improvement

OFI 6.1.3-1:Ensure that an appropriate team is assembled for the aspects and impacts risk review, including Veolia staff.

OFI 6.1.3-2: Improve record keeping of the people involved in the aspects and impacts risk register updates.

[290] HW2006-2014 16.010 Letter - Response to EPA - Dungog WTP.pdf
[291] Schedule - ER0054 - Depot and work site environmental inspection schedule.xls
[292] Environmental site inspection_010617_Elermore Vale Res.pdf, HW2014-778 13 9.051 Email - File Note Inspection of Kurri WWTW 29 November 2016.docx, HW2014-778 13 12.018 Report - Gresford WTP Environmental Inspection - April 2017.pdf
[293] HW2014-778 13 12.018 Report - Gresford WTP Environmental Inspection - April 2017.pdf
[294] gresford chemical bund – integrum.pdf

Clause 7.1 – Quality Management Systems

Clause 7.1.1

Table B-21. Clause 7.1.1 compliance grade

Subclause	Requirement	Compliance grade
7.1.1	By 30 June 2017, Hunter Water must develop a Management System that is consistent with the Australian Standard *AS/NZS ISO 9001:2008: Quality Management Systems – Requirements* (Quality Management System).	Full

Risk	Target for full compliance
Not having developed a quality management system, consistent with *AS/NZS ISO 9001:2008* and in the required time frame, would mean a risk of non-compliance with the operating licence.	A quality management system that has been developed to the requirements of *AS/NZS ISO 9001:2008* by 30 June 2017.

Evidence sighted

- Interviews with Manager IMS and Regulatory Economist
- 7.1.1 - IMS - Certification ISO 9001 and Surveillance 14001 and 4801 - 27-31 July 2015 - Audit Findings.xls
- 7.1.1 - IMS - Re-cert AS 4801_surveillance QMS and Env - November 2016 - Audit Findings.xlsx
- 7.1.1 - IMS - Surveillance Audit WHS, Env, Quality_Dec 2015 - Audit Findings.xls
- 7.1.1 - IMS - Surveillance WHS, Env, Quality - May 2016 - Audit Findings.xls
- 7.1.1 - IMS - Transition ISO 9001_2015 and surveillance WHS and Env - May 2017 - Audit Findings.xlsx
- 7.1.1 – Certificate of Conformance ISO9001.2008 issued by DNV-GL.pdf
- 7.1.1 – Certificate of Conformance ISO9001.2015 issued by DNV-GL.pdf
- 7.1.1 – Surveillance Audit Report May 2017.docx
- 7.1.1 – Surveillance Audit Report November 2016.docx

Summary of reason for grade

Hunter Water's quality management system achieved certification to *ISO 9001:2008* in August 2015 and therefore, is compliant with clause 7.1.1 as it developed a quality management system before the due date of 30 June 2017. Hunter Water has recently achieved certification to *ISO 9001:2015*. We would like to commend Hunter Water on achieving this certification. We checked the external audit reports as part of assessing clauses 7.1.2 and 7.1.3. This clause achieves full compliance.

Discussion and notes

Hunter Water's system was certified to *ISO 9001:2008* in August 2015. Hunter Water provided evidence to support the certification. IPART's instructions to the auditors were to check certification and the external audit report. We confirmed the standard certified to and the period of certification of the certificate issued by DNV-GL. Hunter Water has recently achieved certification to *ISO 9001:2015* and a certificate was provided to confirm this.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

Clause 7.1.2

Table B-22. Clause 7.1.2 compliance grade

Subclause	Requirement	Compliance grade
7.1.2	Hunter Water must ensure that: a) by 30 June 2017, the Quality Management System is certified by an appropriately qualified third party to be consistent with the Australian Standard *AS/NZS ISO 9001:2008: Quality Management Systems – Requirements*; and b) once the Quality Management System is certified under condition 7.1.2(a), the certification is maintained during the remaining term of this Licence.	Full

Risk	Target for full compliance
Not having had the quality management system certified by an appropriately qualified third party and then maintaining it, could mean a major risk of breach of this licence clause.	A quality management system that has been certified to the requirements of *AS/NZS ISO 9001:2008* by 30 June 2017 by an appropriately qualified third party. That the certified system is maintained for the remaining period of the operating licence.

Evidence sighted

- Interviews with Regulatory Economist and IMS Manager
- 7.1.2 - IMS - Certification ISO 9001 and Surveillance 14001 and 4801 - 27-31 July 2015 - Audit Findings.xls
- 7.1.2 - IMS - Re-cert AS 4801_surveillance QMS and Env - November 2016 - Audit Findings.xlsx
- 7.1.2 - IMS - Surveillance Audit WHS, Env, Quality_Dec 2015 - Audit Findings.xls
- 7.1.2 - IMS - Surveillance WHS, Env, Quality - May 2016 - Audit Findings.xls
- 7.1.2 - IMS - Transition ISO 9001_2015 and surveillance WHS and Env - May 2017 - Audit Findings.xlsx
- 7.1.2 – Certificate of Conformance ISO9001.2008 issued by DNV-GL.pdf
- 7.1.2 – Certificate of Conformance ISO9001.2015 issued by DNV-GL.pdf
- 7.1.2 – Surveillance Audit Report May 2017.docx
- 7.1.2 – Surveillance Audit Report November 2016.docx

Summary of reason for grade

Hunter Water supplied evidence to confirm that its Quality Management System was certified by a reputable third party certifier, to meet the requirements of *AS/NZS ISO 9001:2008*. Hunter Water also provided evidence to show that ongoing certification and surveillance audits had been undertaken since certification with two of the audits (as IMS audits) having occurred in the audit date scope. Since certification, Hunter Water has transitioned to *ISO 9001:2015* with certification achieved in June 2017. This clause achieves full compliance.

Discussion and notes

As noted in clause 7.1.1, Hunter Water's system was certified to *AS/NZS ISO 9001:2008* in August 2015. Hunter Water has since transitioned to *ISO 9001:2015* with the certificate of conformance to this new standard awarded in June 2017 and Hunter Water provided evidence[295] to support the certification by the company DNV-GL. IPART's instructions to the auditors were to check that certification has been maintained and the external audit report.

[295] 7.1.2 – Certificate of Conformance ISO9001.2015 issued by DNV-GL.pdf

As noted under clause 6.1.2, the third party certifier used by Hunter Water, DNV-GL, is a reputable and appropriately qualified third party.[296]

With regard to the 2008 standard (and as noted in clause 6.1.2), Hunter Water provided evidence to support the implementation of periodic surveillance audits (Table B-23), also conducted by DNV-GL. This information was reviewed and we confirmed that audits have been ongoing since certification in August 2015, with two of the audits having occurred within the audit date scope for this operational audit.

An audit conducted in November 2016 had several findings of 'minor'. However, by May 2017 [297], there was one finding of 'minor' with all other findings being 'observations' or 'opportunity for improvement' – and the vast majority of these were for *ISO 9001:2015* clauses. This evidence demonstrates a commitment to improvement and maintenance of the system.

Table B-23. Dates of DNV-GL periodic audits

Date	Audit Type	Within Audit Date Scope?
27 to 31 July 2015[298]	Integrated Management System Audit	No
30 November to 2 December 2015[299]	Integrated Management System Surveillance Audit	No
25 May 2016[300]	Integrated Management System Surveillance Audit (includes transition to ISO 9001:2015 standard)	No
4 November 2016[301]	Integrated Management System Surveillance Audit	Yes
5 May 2017[302]	Integrated Management System Surveillance Audit and Transition to ISO 14001:2015	Yes

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

[296] Originally formed in 1864, as Det Norske Veritas. We confirmed DNV-GL 'active status' on the JAS-ANZ register http://www.jas-anz.org/our-directory/certified-organisations?combine=&country%5B%5D=Australia&location=Sydney&standard%5B%5D=AS%2FNZS+ISO+14001%3A2004&scope=&accredited_body=All 30/10/17. JAS-ANZ approval means that DNV-GL has been approved by an independent third-party as a professional body that acts with integrity when certifying or inspecting for conformity assessment.

[297] 7.1.2 - IMS - Transition ISO 9001_2015 and surveillance WHS and Env - May 2017 - Audit Findings.xlsx

[298] 7.1.2 - IMS - Certification ISO 9001 and Surveillance 14001 and 4801 - 27-31 July 2015 - Audit Findings.xls

[299] 7.1.2 - IMS - Surveillance Audit WHS, Env, Quality_Dec 2015 - Audit Findings.xls

[300] 7.1.2 - IMS - Surveillance WHS, Env, Quality - May 2016 - Audit Findings.xls

[301] 7.1.2 - IMS - Re-cert AS 4801_surveillance QMS and Env - November 2016 - Audit Findings.xlsx; 7.1.2 – Surveillance Audit Report November 2016.docx.

[302] 7.1.2 – Surveillance Audit Report May 2017.docx

Clause 7.1.3

Table B-24. Clause 7.1.3 compliance grade

Subclause	Requirement	Compliance grade
7.1.3	Hunter Water must ensure that by 30 June 2017, the Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the system.	Full

Risk	Target for full compliance
Having a system in place but not fully implementing it, may mean that risks associated with quality, that are thought to be managed, are not in practice.	A Quality Management System, meeting the requirements of *AS/NZS ISO 9001:2008* that has been implemented according to the stated requirements, by 30 June 2017.

Evidence sighted

- Interviews with Regulatory Economist and IMS Manager
- 7.1.3 Register - Interested Parties for QMS, EMS.docx
- 7.1.3 Standard - Information Release and Privacy.docx
- 7.1.3 Standard - Third Party Information Management.docx
- 7.1.3 - Customer Consultation - Growth Infrastructure.jpg
- 7.1.3 - customer engagement at Education Centre.jpg
- 7.1.3 - customer engagement at public event.jpg
- 7.1.3 - customer engagement material re 2017 Lochinvar WW PS and Rising Main.pdf
- 7.1.3 - Customer engagement material re CTGM Replacement Tarro Duckenfield Fact Sheet.pdf
- 7.1.3 - Hunter Water - Customer Journey Mapping.pdf
- 7.1.3 - Position Description_Quality Manager.docx
- 7.1.3 - Strategic Risk Register - Non-compliance with agreed water quality standards.xlsx
- 7.1.3 2017-03-17_Hunter_Water_Developer_Services_Report.pdf
- 7.1.3 Community Consultation Forum Minutes - February 2017.PDF
- 7.1.3 Complex Works - Communication Package 17 February 2017.pdf
- 7.1.3 Corporate Risk Driver Analysis - Drinking water leakage.xlsx
- 7.1.3 Corporate Risk Driver Analysis - Inadequate wastewater capacity.docx
- 7.1.3 Corporate Risk Driver Analysis - Inadequate water capacity.xlsm
- 7.1.3 Corporate Risk Profile - May 2017.docx
- 7.1.3 Customer Phone Survey Questions.docx
- 7.1.3 Customer phone survey results FY2016-17.msg
- 7.1.3 DNV GL Audit Findings May 2017.xlsx
- 7.1.3 DNV GL Audit Findings November 2016.xlsx
- 7.1.3 Enterprise Risk Management Framework.pdf
- 7.1.3 Example internal audit report_Operational Procedures and Process Control.docx
- 7.1.3 HW website screenshot - Community Consultation Forums.jpg
- 7.1.3 IMS Review Meeting Minutes_December 2016.docx
- 7.1.3 IMS Review Meeting Pre-Reading Report_December 2016.doc
- 7.1.3 IMS Review Meeting Presentation_December 2016.pptx
- 7.1.3 Information Management Policy.docx
- 7.1.3 Integrated Management System Manual.docx
- 7.1.3 MakingWaves_November2016February2017.pdf
- 7.1.3 Management System Audit Programme - tabs 2016 and 2017.xlsx
- 7.1.3 Presentation to Consultative Forum - New Model for delivery of Developer Works.pdf
- 7.1.3 Procedure - Manage Document Control.docx
- 7.1.3 Procedure - Managing Legal and Other Requirements.docx

- 7.1.3 Procedure IMS Management Review Meeting.docx
- 7.1.3 Quality Policy_signed July 2015.pdf
- 7.1.3 Register - Legal and Other Requirements - Quality.xlsx
- 7.1.3 Resources to support QMS.pdf
- 7.1.3 Risk Assessment - Poor relationships with stakeholders.xlsm
- 7.1.3 Risk Driver Analysis - Inadequate knowledge and information management.xlsm
- 7.1.3 Risk Driver Analysis - Poor relationships with customers.xlsm
- 7.1.3 Standard - Copyright and Intellectual Property.docx
- 7.1.3 Standard - Corporate Document Control.docx
- 7.1.3 Standard - Enterprise Information Management.docx
- 7.1.3 Standard - Information Archiving and Destruction.docx
- 7.1.3 Standard - Information Asset Management.docx
- Email - Corporate Risk Update - ERM in review.msg (12/04/2017)
- Version history - Standard Document Control.pdf
- Integrum WQ Incident Sep 2016.pdf
- Integrum NCR.pdf
- Extract from CS0341 Treatment Operations Contract - Drinking Water Quality Management System.docx
- Draft Library - Doc Control.pdf

Summary of reason for grade

Hunter Water has implemented an Integrated Management System which includes Quality Management. Hunter Water has achieved and maintained its certification to the standard *ISO 9001:2008* and achieved certification *to ISO 9001:2015*, all by 30 June 2017. We tested the requirements of several areas of the quality requirements within the IMS including via the drinking water and environmental components of this operating licence audit. Hunter Water has a robust system in place for managing quality aspects of its business and interviewees were able to corroborate system implementation, having a good understanding of the quality aspects and processes of the business. We commend Hunter Water on the succinct nature of its IMS Manual. The Manual represents a clearly articulated picture of the way in which the IMS is constructed including how quality fits within that system.

For the most part, and as borne out by the external auditors' reports, our audit confirmed that the system is implemented in practice. Within the audit date scope, there are two key documents which had not been reviewed according to their review frequency, these being the Corporate Document Control Standard and the Enterprise Risk Management Framework. We acknowledge that given that both documents were undergoing wholesale review (for instance the Enterprise Risk Management Framework is being turned into a Standard), there is a sound reason that they had not yet been finalised. There were also some gaps in terms of filling in non-conformance records. The Enterprise Risk Management Framework and the Corporate Document Control Standard are currently awaiting approval and implementation and good reason was provided to this end. As result, this clause has been awarded full compliance but as an observation, these documents should be finalised and implemented as a priority, in the 2017-18 financial year due to their fundamental status to the Integrated Management System and good corporate functioning. From discussion with the IMS Manager, it is expected that Hunter Water will finalise the outstanding documents within the 2017-18 financial year.

Discussion and notes

As noted in clause 7.1.2, Hunter Water has transitioned to *ISO 9001:2015* with the certificate of conformance to this new standard awarded in June 2017.

Hunter Water operates its Quality Management System (QMS) as part of its IMS. An IMS Manual was provided as evidence to support how the system has been built and how it operates – the QMS is

defined within that Manual.[303] We tested several areas of Quality Management for implementation of clause 7.1.3 both in the audit time for this licence condition (below) and through the drinking water quality and environment clauses (noted within the findings for those licence conditions).

Resourcing

A Quality Manager is employed by Hunter Water, their role[304] is primarily responsible for the development, implementation, maintenance and continuous improvement of the Quality Management System.

The Quality Manager reports to the IMS Manager and a diagram[305] was provided to show how resources within Hunter Water support the correct operation of the IMS. Hunter Water is currently undergoing a restructure and this was discussed at the interview. It was noted that the manager responsible for quality does not currently have 'quality' in the title. It was suggested that the title could be changed to align with other organisations including Hunter Water's operating contractor – to the more universal 'SHEQ' or Safety, Health, Environment and Quality.

Quality is largely centred around the drinking water and recycled water management systems as explained in the IMS Manual. The Quality Manager's job is to oversight the specific aspects of quality as a liaison role working with other parts of the business. During the audit interview it was noted that while the Quality Manager attends Water Quality Committee meetings, the position is not included in the Water Quality Committee terms of reference.[306] We note that the Quality Manager was an 'apology' for the meeting occurring 6 July 2017.[307]

Overall, resourcing of quality appears to be appropriate and implemented.

Integrated Management System

Hunter Water stated that its system consists of policies, standards, procedures, guidelines, forms and registers with work practice documents being formally controlled through Integrum. We checked Integrum at the audit interviews for the quality aspects as well as through the environment and drinking water clauses.

Document Control and Review

We checked how obsolete documents are removed from the document library. It was noted that obsolete documents can not be hidden from view or completely deleted from the system (as an artefact of the records management system). Hunter Water therefore currently uses file naming to include 'Not in Use' or 'Current' to signify currency of documents. We confirmed this to be the case.

We checked several documents for adequacy of information. As an observation, we noted a high frequency of reference to incorrect acronyms or names of documents in particular, reference to AGRW not AGWR i.e. Australian Guidelines for Recycled Water when it should be Australian Guidelines for Water Recycling (noted in PD and in other places). We discussed this with the IMS Manager who confirmed that the typographical errors are being picked up in the next round of IMS review.

We queried why *ISO 14001* was not included in the legal register. Hunter Water is in the process of procuring and implementing a new online Governance, Risk and Compliance (GRC) solution. This

[303] 7.1.3 Integrated Management System Manual.docx, covered in overview at section 1, Introduction, p5. Version 4, 28/10/16.
[304] 7.1.3 - Position Description_Quality Manager.docx.
[305] 7.1.3 Resources to support QMS.pdf.
[306] 2.1 EL5 A5.3.2 HW2006-1417 15 16.001 Water Quality Committee Terms of Reference.pdf (note that this document is out of audit date scope at 7/12/2017).
[307] 2.1 EL11 A11.2.2 HW2006-1417 28 8.013 Minutes - July 2017 Water Quality Committee Meeting.DOCX (note that this document is out of audit date scope at 6/7/2017).

new GRC solution will capture all relevant information for specific business functions when installed, and should help to streamline legal and formal requirements for all business areas.

Several registers were provided by Hunter Water as evidence. We checked registers related to strategic risk, legal and other requirements and the stakeholders and other interested parties.[308]

A significant point for discussion during the audit was the apparent currency issue for both the Enterprise Risk Management Framework[309] and the Corporate Document Control Standard.[310] At interview we confirmed that the intention of Hunter Water is to bring the new version into operation within the 2017-18 financial year. We sighted evidence to show that the standard was being reviewed.[311] Comments relating to ERM Framework are provided below.

We checked implementation of the Corporate Document Control Standard in practice. We checked standards[312] related to information management, copyright and intellectual property and document control. All standards met the requirement for a two year review cycle apart from the document control standard which had exceeded its two year review cycle (see comments above). All standards reviewed contained document control information in accordance with the document control standard.

We checked the Enterprise Risk Management Framework[313] as an example of a framework document. The review cycle should have been a maximum of 5 years and was stated as being 2 years i.e. more stringent than required. The review should have occurred in 2015 but had not occurred within the required timeframe based on the document control table. Hunter Water stated that this document is undergoing complete review, has been changed to a 'standard' and is currently with the executive for approval. We sighted an email[314] from the Corporate Risk Analyst confirming that updates to the ERM had been approved for use within the audit date scope (pending final approval).

We checked procedures[315] relating to document control, managing legal and other requirements and IMS management review meetings. All the documents matched the review cycle requirements for a procedure. Only one had a mismatch between the approval date within the document control table (for Version 4) and an older version approval date (for Version 3).[316]

As an observation, we queried whether there is a standard approach to the document control history at Hunter Water as some documents had just the Version 1 information and others had the 'pre-information' i.e. useful information related to iteration of the documents (noting the standard states the following):

> *"changes and the current revision status of documents are identified, including*

[308] 7.1.3 Register - Interested Parties for QMS, EMS.docx (Check date); 7.1.3 - Strategic Risk Register - Non-compliance with agreed water quality standards.xlsx; 7.1.3 Register - Legal and Other Requirements - Quality.xlsx (27/6/17).
[309] 7.1.3 Enterprise Risk Management Framework.pdf (version 3, February 2013, next review 2015).
[310] 7.1.3 Standard - Corporate Document Control.docx (out of date but currently undergoing wholesale review).
[311] Version history - Standard Document Control.pdf (screenshot showing revisions).
[312] 7.1.3 Standard - Information Release and Privacy.docx (Version 1, 29/05/17); 7.1.3 Standard - Third Party Information Management.docx (Version 1, 4/05/2017); 7.1.3 Standard - Copyright and Intellectual Property.docx (Version 1, 4/05/17); 7.1.3 Standard - Corporate Document Control.docx (Version 1, approved either 19/9/14 or 26/09/2014 – out of date, next scheduled review should have been 19/09/2016); 7.1.3 Standard - Enterprise Information Management.docx (Version 1, 4/05/2017); 7.1.3 Standard - Information Archiving and Destruction.docx (Version 1, 4/05/17); 7.1.3 Standard - Information Asset Management.docx (Version 1, 4/05/17).
[313] 7.1.3 Enterprise Risk Management Framework.pdf (Version 3, 28/2/2013 – next review due 2015).
[314] Email - Corporate Risk Update - ERM in review.msg (12/04/2017).
[315] 7.1.3 Procedure - Manage Document Control.docx (Version 2, 21/07/2015); 7.1.3 Procedure - Managing Legal and Other Requirements.docx (Version 3, 22/07/2015); 7.1.3 Procedure IMS Management Review Meeting.docx (Version 4, 1-6-2016 – noting that the footer approval date was for Version 3 not Version 4 i.e. 13/07/2015).
[316] 7.1.3 Procedure IMS Management Review Meeting.docx (Version 4, 1-6-2016 – noting that the footer approval date was for Version 3 not Version 4 i.e. 13/07/2015).

author"[317]

We also noted that footer document control history sometimes did not exactly match the tabulated document control history. We also noted that revision history had not been completed for: 7.1.3 Corporate Risk Driver Analysis - Inadequate water capacity.xlsm. The IMS Manager confirmed that in future, document control history would include more automation to remove the discrepancies in information fields.

Context of the organisation

Context of the organisation is clearly described in section 2 of the IMS Manual.[318] All interviewees also provided background information on where their areas sat within the IMS, which provides good corroborating evidence for embedding of the IMS in practice.

Leadership

Leadership and commitment is described in section 4 of the IMS Manual. Policy is one of the ways in which commitment is formalised. Hunter Water's Quality Policy was sighted[319] and met the audit date scope requirements and the review cycle[320] requirements. We note that the Quality Policy also references the Drinking Water and the Recycled Water Quality Policies as an important component of the overall quality approach to Hunter Water's products and services. We sighted both the Drinking Water and Recycled Water Quality Policies in place at the field audits (including external contractor-operated sites). Hunter Water also describes its aspiration to be a thought leader[321] in developing a sustainable and resilient water and wastewater future.

Records

For the most part, we sighted evidence to show that records are kept in practice. There were some areas for improvement including documentation of NCR information within Integrum, where one NCR[322] was recorded as having been closed out but no information was included in the field[323] for the 'responsible person' to demonstrate how the non-conformity had been resolved.

Operation

We sighted evidence to support operational implementation of the IMS with systems generally being used well. We have provided findings within clauses 2.1 and 6.1. We confirmed that risk is embedded from a quality and operational perspective through interviews under water quality (clause 2.1) and environment (clause 6.1). In addition, we confirmed that Hunter Water identifies, assesses and manages risks at a broader corporate level through the ERM Framework (see above) and through outputs including a strategic risk register and assessment of the corporate risk profile.

Interested Parties

Hunter Water uses a register[324] to capture interested parties for the IMS and QMS. The register is currently in draft as it is being reviewed with stakeholders across the business. We note that MidCoast Water is not currently included as an interested party (an important drinking water customer of Hunter Water's) although from this year, the customer will be MidCoast Council.

---

[317] Standard – Corporate Document Control TRIM: HW2013-421/22

[318] 7.1.3 Integrated Management System Manual.docx (Version 5, 25/8/17 – while out of audit date scope, the last version was 28/10/16 with the only changes made in version 5 being a new format and ISO 9001:2015 requirements. Therefore, version 5 was considered acceptable for the audit).

[319] 7.1.3 Quality Policy_signed July 2015.pdf (Version 1, effective from 15/07/2015, next review 15/07/2018).

[320] Three-yearly, as per 7.1.3 Standard - Corporate Document Control.docx (out of date but currently undergoing wholesale review).

[321] 7.1.3 Corporate Risk Profile - May 2017.docx (as at 25/05/2017).

[322] KMCT-E125E2 (noted as having been closed out 25/01/2017).

[323] "*Verification by Responsible Person that original Nonconformity is Resolved*"

[324] 7.1.3 Register - Interested Parties for QMS, EMS.docx (draft)

Customers

Hunter Water engages with customers through a range of channels including social media, website, customer forums, newsletters, bills, Call Centre and face to face events. We sighted a range of evidence[325] to confirm implementation of Hunter Water's customer engagement in practice.

Review and Improvement of IMS

Review of the IMS occurs and several pieces of information were provided to confirm that this happens in practice[326] – including the external audits discussed in clauses 7.1.1 and 7.1.2. It is Hunter Water's intention to migrate other improvement plans (e.g. Drinking Water Quality Management Improvement Plan) into the new GRC package to help integrate information (see also Element 12 of the Framework under clause 2.1.1 and 2.1.2 findings). We confirmed that evaluation and improvement are fundamental components of the review process with outcomes of reviews being used by the executive to help inform decision-making.[327] We also sighted evidence of improvement as part components of auditing the drinking water and environment clauses (see those sections for findings). The product quality components outsourced to a contractor are also incorporated into the audit process. The treatment contract[328] has a requirement for the contractor to establish and implement a Drinking Water Quality Management System and to have it audited, for compliance with the ADWG and Framework for Management of Drinking Water Quality, by an approved auditor. The contractor is also audited as part of this operating licence audit and as part of the contract, must provide to Hunter Water:

> *"…..evidence of continuous improvement of all management systems including copies of all audit reports."*

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

OFI 7.1.3-1: Ensure that the Manager Health, Safety and Environment's title is updated to also include 'Quality' e.g. 'SHEQ' or Safety, Health, Environment and Quality (to align with other organisations).

OFI 7.1.3-2: Add Quality Manager as a member to the Water Quality Committee (in the terms of reference).

OFI 7.1.3-3: Ensure that MidCoast Council is added as an interested party to the 'Interested Parties for QMS, EMS Register'.

---

[325] 7.1.3 - Customer Consultation - Growth Infrastructure.jpg; 7.1.3 - customer engagement at Education Centre.jpg; 7.1.3 - customer engagement at public event.jpg; 7.1.3 - customer engagement material re 2017 Lochinvar WW PS and Rising Main.pdf; 7.1.3 - Customer engagement material re CTGM Replacement Tarro Duckenfield Fact Sheet.pdf; 7.1.3 - Hunter Water - Customer Journey Mapping.pdf; 7.1.3 2017-03-17_Hunter_Water_Developer_Services_Report.pdf; 7.1.3 Community Consultation Forum Minutes - February 2017.PDF; 7.1.3 Complex Works - Communication Package 17 February 2017.pdf; 7.1.3 Customer Phone Survey Questions.docx; 7.1.3 Customer phone survey results FY2016-17.msg; 7.1.3 HW website screenshot - Community Consultation Forums.jpg; 7.1.3 MakingWaves_November2016February2017.pdf; 7.1.3 Presentation to Consultative Forum - New Model for delivery of Developer Works.pdf.

[326] 7.1.3 DNV GL Audit Findings May 2017.xlsx; 7.1.3 DNV GL Audit Findings November 2016.xlsx; 7.1.3 IMS Review Meeting Minutes_December 2016.docx; 7.1.3 IMS Review Meeting Pre-Reading Report_December 2016.doc; 7.1.3 IMS Review Meeting Presentation_December 2016.pptx; 7.1.3 Management System Audit Programme - tabs 2016 and 2017.xlsx.

[327] 2.1 EL11 A11.2.2 HW2013-1447 2.025 Minutes - Management System Review Meeting 14 August 2017.DOCX (note that while out of audit date scope, the scope for the review was the 2016-2017 period, therefore the document has been accepted as evidence).

[328] CS0341 Treatment Operations Contract (under section 11.4 Management Systems).

OFI 7.1.3-4: Ensure that the Enterprise Risk Management Standard[329] and Corporate Document Control Standard[330] are finalised and implemented within the 2017-2018 financial year.

OFI 7.1.3-5: In training, reinforce the need to fill in all record fields in Integrum and other areas, such as software systems and other areas of documentation, as required.

[329] 7.1.3 Enterprise Risk Management Framework.pdf (version 3, February 2013, next review 2015).
[330] 7.1.3 Standard - Corporate Document Control.docx (out of date but currently undergoing wholesale review).

Clause 8.2 – Reporting

Clause 8.2.2

Table B-25. Clause 8.2.2 compliance grade

Subclause	Requirement	Compliance grade
8.2.2	Hunter Water must maintain sufficient record systems that enable it to report accurately in accordance with condition 8.2.1.	Full

Risk	Target for full compliance
The performance of Hunter Water is unable to be ascertained if reported data is inaccurate.	To achieve full compliance, Hunter Water needs to demonstrate that it maintains record systems that are sufficient to enable it to accurately report data in accordance with the Reporting Manual.

Evidence sighted

- 8.2.2 - Board Paper - 12.2 Statement of Compliance.DOCX
- 8.2.2 - Email - Action_ Compliance Calendar status update and change process.pdf
- 8.2.2 - Email - Action_ Regulatory Reports 2016_Reg Policy to Business.pdf
- 8.2.2 - Email - Action_Review and approve c and p report by EOB Monday 21 August 2017.pdf
- 8.2.2 - Email - CFO to MD - Annual Compliance and Performance Report 2016-17.pdf
- 8.2.2 - Email - Luke (IPART) to Turner (HWC) - Ack receipt - Compliance and Performance Report 2015-16.pdf
- 8.2.2 - Email - Reg Policy to Business - Operational Audit - Status Report to IPART on Recommendations.pdf
- 8.2.2 - Email - Reg Policy to Business - Significant Changes - Report to IPART 31 March 2017.pdf
- 8.2.2 - Email - RP to Executives - to IPART - Op Audit Recommendation Status and Significant Changes.pdf
- 8.2.2 - Example of endorsement of compliance and performance report chapter.docx
- 8.2.2 - Guideline - Compliance and Performance Report 2016 - Process and Responsibilities.DOCX
- 8.2.2 - Presentation - Annual Regulatory Report Prep 2016 - pages 2,3,6,7.PPTX
- 8.2.2 - Presentation - Annual Regulatory Report Prep 2016 - Statement of Compliance - slides 6,8.PPTX
- 8.2.2 - Register - ALS Lab Contract Audit Inspection Register.XLS
- 8.2.2 - RE_HPRM_Hunter_Water_-_Operational_Audit_Recommendations_Status_Report.msg
- 8.2.2 - RE_Hunter_Water_-_Significant_changes_to_management_systems.msg
- 8.2.2 - Screenshot - Compliance Calendar - May 2017.JPG
- 8.2.2 - Signoff on internal template - Statement of Compliance - Finance - 2015-16.DOCX
- 8.2.2 - Template - Statement of Compliance - Finance - 2015-16.DOCX
- 8.2.2 Cl 2.3.1 Guideline - Criteria for Notification to NSW Health - Drinking Water Quality.XLS
- 8.2.2 Cl 2.3.1 MOU - Hunter Water and NSW Health pages 2 and 6.pdf
- 8.2.2 CL 2.3.1 Procedure - Water Quality Notification to NSW Health.doc
- Template - IPT1707J Questionnaire 2.0 - Performance Monitoring.DOCX
- System Performance Standards
- 8.2.2 - Compliance and Performance report 2016-17.pdf
- 8.2.2 - System Performance Standards.DOCX
- Wastewater Overflow
  - 8.2.2 - Guideline, Wastewater Overflow Standard, Priority Matrix.xls
  - 8.2.2 - Properties Experiencing Dry Weather Sewage Overflows.docx
  - 8.2.2 - QP0521 Procedure for System Performance Standard Licence Reporting.doc

  - 8.2.2 - Wastewater Overflows Access Queries.docx
- Water Continuity
  - 8.2.2 - Manual - ClearSCADA User Reference Manual 2013 View Only V1_06.pdf
  - 8.2.2 - AOMS Training Manual - Water Continuity.pdf
  - 8.2.2 - Completed Water Continuity Report - 421 Pacific Hwy Belmont - AOMS 509993.PDF
  - 8.2.2 - Discontinuity Assessment and Reporting Procedure.DOCX
  - 8.2.2 - Hunter Water Monitoring and Reporting Protocol - Water Continuity.pdf
  - 8.2.2 - SCADA Help View.jpg
  - 8.2.2 - Water Continuity Access Queries.docx
- Water Pressure
  - 8.2.2 - Manual - ClearSCADA User Reference Manual 2013 View Only V1_06.pdf
  - 8.2.2 - AOMS Training Manual - Water Pressure.pdf
  - 8.2.2 - Hunter Water Monitoring and Reporting Protocol - Water Pressure.pdf
  - 8.2.2 - SCADA Help View.jpg
- Template - Recommendation 2015-16-07 - Performance monitoring - Maintain record systems (Clause 8.2.2).docx
- Rec 07 - 2015-16 - Business Requirements Document - Document Control Long Term.docx
- Rec 07 - 2015-16 - Document Types – Feedback and comments from Workshops_Aug and Sep 2017.docx
- Rec 07 - 2015-16 - Gateway - Plan Checkpoint - Document Control Long Term.pptx
- Rec 07 - 2015-16 - Minutes - Doc Control Plan Checkpoint Minutes.docx
- Rec 07 - 2015-16 - New Idea 278 - Solution for Document Control.jpg
- Rec 07 - 2015-16 - Schedule of controlled document audit evidence.docx
- Rec 07 - 2015-16 - Solution Requirements Document - Document Control Long Term.docx
- Rec 07 - 2015-16 - Standard - Corporate Document Control.docx

Summary of reason for grade

Our audit found that Hunter Water's management systems and information systems are sufficiently robust for the purpose of accurate reporting in accordance with the reporting manual. The reporting data within the scope of the audit relating to the reporting manual was found to be reliable. While some minor issues have been noted in this audit report in relation to Hunter Water's management system documentation, these do not impact on the reported information.

Discussion and notes

Clause 8.2.2 requires Hunter Water to maintain sufficient record systems that enable it to report accurately in accordance with condition 8.2.1 – where Clause 8.2.1 refers to Hunter Water's reporting obligations set out in the Reporting Manual. These reporting obligations cover activities relating to most areas of the operating licence and a set of performance indicators.

Hunter Water uses HP Records Manager (TRIM) as its record management system and hence documents required for reporting under the reporting manual are reviewed, endorsed and approved in this system. A compliance calendar is maintained to track reporting obligations.

The Regulatory Policy team has responsibility for coordinating and compiling compliance and performance reports. The Regulatory Policy teams provide guidance to business owners who are then responsible for providing reporting information and any associated commentary. The reporting information is completed and subject to internal review and endorsement before being issued to IPART and publicly.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

B Compliance grades

Compliance grades for public utilities

Grades of compliance	Description
Full Compliance 	Sufficient evidence to confirm that the requirements have been fully met.
High Compliance 	Sufficient evidence to confirm that the requirements have generally been met apart from **very few minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Adequate Compliance 	Sufficient evidence to confirm that the requirements have generally been met apart from **a number of minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Non compliant 	Sufficient evidence has **not** been provided to confirm that all major requirements are being met and the deficiency adversely impacts the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
No Requirement 	The requirement to comply with the licence condition does not occur within the audit period or there is no requirement for the utility to meet this assessment criterion.

Source: IPART, *Audit Guideline – Public Water Utilities,* May 2016.

C Hunter Water's statement of compliance

Hunter Water Corporation
ABN 46 228 513 446

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300
1300 657 657 (T)
(02) 4979 9625 (F)
enquiries@hunterwater.com.au
hunterwater.com.au

31 August 2017

Our Ref: HW 2009-1194/13/2.001

The Chief Executive Officer
Independent Pricing and Regulatory Tribunal
Level 15, 2-24 Rawson Place
Sydney NSW 2000

Dear Mr Harmstorf,

Statement of compliance for 2016-17

Submitted by Hunter Water

Hunter Water reports as follows:

1. This statement documents compliance during 2016-17 with all obligations to which Hunter Water is subject by virtue of its operating licence.

2. This report has been prepared by Hunter Water with all due care and skill to the best of its knowledge of conditions to which it is subject under the *Hunter Water Act 1991*.

3. Schedule A provides information on all obligations with which Hunter Water did not comply during 2016-17.

4. Other than the information provided in Schedule A, Hunter Water has complied with all conditions to which it is subject.

5. This compliance report has been approved by the Chief Executive Officer (or equivalent) and the Chairman of the Board of Directors of Hunter Water/ Duly authorised Board Member of Hunter Water.

Signed:

Name: JIM BENTLEY

Designation: Managing Director

DATE: 31/08/2017

Signed:

Name: TERRY LAWLER

Designation: Chairman

DATE: 31/08/2017

Schedule A - Non Compliances identified during the reporting period

Table #	List clauses breached, including a brief description of each licence clause	For all non-compliances describe: i Date or period of non-compliance ii Nature and extent of non-compliance (including whether and how many customers have been affected) iii Results of any monitoring (where applicable) iv Reasons for non-compliance v Remedial action taken vi Actual/anticipated date of full compliance
	Operating Licence clause 4.2.3.(a).(i). Water Continuity Standard. Hunter Water must ensure that in a financial year no more than 10,000 Properties experience an Unplanned Water Interruption that lasts more than 5 continuous hours.	i. The non-compliance occurred during 2016-17 ii. During 2016-17, 10,144 properties were affected by an unplanned water interruption that lasted for more than 5 hours, exceeding the standard by 144 properties. iii. N/A iv. Performance against the Water Continuity Standard is sensitive to large trunk main failures, which can occur without warning. The main contributor to this exceedance was a water main break in western Lake Macquarie in February 2017, which impacted more than 5,000 properties in the suburbs of Morisset, Cooranbong, Dora Creek and Wyee Point for an extended period. This leak occurred over a weekend in a remote area of Hunter Water's network, and took some time to locate, isolate and repair. v. At the time of the event, Hunter Water took proactive steps to address water continuity issues, including the delivery of bottled water to customers, water tankers and an active media presence alerting consumers to the issue. Affected customers received a rebate on their water usage, as per the Customer Contract. Since this event, Hunter Water has taken a number of actions to improve the operation of its water network including: • Allocating funding and assessing the best options to install new flow meters / pressure monitoring equipment in the West Lakes zone. • A new procedure for systematically isolating the system and conserving storage in bulk reservoirs. vi. Hunter Water anticipates to achieve full compliance with this licence clause in the next reporting period (2017-18).

<table>
<tr><th>Table #</th><th>List clauses breached, including a brief description of each licence clause</th><th>For all non-compliances describe:
i Date or period of non-compliance
ii Nature and extent of non-compliance (including whether and how many customers have been affected)
iii Results of any monitoring (where applicable)
iv Reasons for non-compliance
v Remedial action taken
vi Actual/anticipated date of full compliance</th></tr>
<tr><td></td><td>Operating Licence Reporting Manual clause 2.3.1

Incident and emergency reporting – Drinking Water and Recycled Water

Hunter Water must immediately report to NSW Health any incident in the delivery of its Services which may adversely affect public health.</td><td>Hunter Water has agreed with NSW Health that non-compliance against CCPs is considered an event that may adversely affect public health and requires immediate notification.

i. There were four non-compliances against the Critical Control Point (CCP) at Four Mile Creek Chlorinator that weren't reported immediately. The date of the breach and subsequent reporting is outlined below:

<table>
<tr><th>Date of CCP Breach</th><th>Reported to NSW Health</th></tr>
<tr><td>17/07/2016</td><td>29/07/2016*</td></tr>
<tr><td>22/07/2016</td><td>29/07/2016*</td></tr>
<tr><td>3/06/2017</td><td>20/06/2017</td></tr>
<tr><td>10/06/2017</td><td>20/06/2017</td></tr>
</table>
* Note that NSW Health was verbally advised on 29/7/16 of the CCP breaches and then formally advised in writing on 7/09/2016, at the next Quarterly Liaison meeting

ii. The critical limit for this CCP is > 4.5 mg/L of free chlorine for > 15 continuous minutes. The details of each breach in terms of the duration of time in excess of the 15 continuous minutes, and the volume supplied during this time are outlined below:

<table>
<tr><th>Date of CCP Breach</th><th>Critical limit of CCP</th><th>Exceedance Period (min)</th><th>Exceedance Volume (kL)</th></tr>
<tr><td>17/07/2016</td><td rowspan="4">> 4.5 mg/L for 15 continuous minutes</td><td>2</td><td>9</td></tr>
<tr><td>22/07/2016</td><td>25</td><td>106</td></tr>
<tr><td>3/06/2017</td><td>6</td><td>10</td></tr>
<tr><td>10/06/2017</td><td>41</td><td>220</td></tr>
</table>
The potentially exposed population to the CCP exceedance within the Four Mile Creek Reservoir zone is approximately 87,000 people.

iii. Network monitoring undertaken downstream of the CCP breaches showed no discernible impact on free chlorine residual. There were no customer complaints downstream of the chlorinator related to taste and odour following the breaches.

iv. The CCP breaches were predominantly due to a sharp decrease in flow out of Four Mile Creek Reservoir and an increased chlorine concentration due to continued dose into this low flow. The chlorinator shut down on each occasion as designed (when the free chlorine concentration exceeded 4.0mg/L for 10 continuous minutes), however due to the long distance of pipework between the analyser and the chlorinator, there is a delay in the analyser receiving the water and information being relayed back to the chlorinator, resulting in the chlorine concentration exceeding the CCP.</td></tr>
</table>

Table #	List clauses breached, including a brief description of each licence clause	For all non-compliances describe: i Date or period of non-compliance ii Nature and extent of non-compliance (including whether and how many customers have been affected) iii Results of any monitoring (where applicable) iv Reasons for non-compliance v Remedial action taken vi Actual/anticipated date of full compliance
		The delay in reporting the information to NSW Health for the two non-compliances in July 2016 was due to an internal procedural error. Alarms are generated in SCADA once a CCP has been breached, however insufficient action text was provided to appropriately guide operators to escalate these breaches. Remedial actions were implemented post the July 2016 non-compliances to minimise the likelihood of future delays in reporting. In June 2017, two more non-compliances occurred. At the time of the breach, system operators interpreted the available SCADA data, including indications that the chlorine supply valve had shut, and concluded that the chlorine overdose had not breached the CCP. As such the breach was not notified until it was later assessed by water network engineers. Additional competency training is being prepared for system operators on the configuration and control of all of Hunter Water's chlorinators, and in the meantime, all available system operators have been debriefed and re-familiarised with the system and notification requirements. v. Remedial actions undertaken to correct internal processes to ensure that this procedural error does not reoccur: 1. Enter alarm text in SCADA informing operators of CCP breaches and the associated actions required. (Updated August 2017 to provide greater clarity). 2. Modify the alarm properties associated with CCPs forcing manual intervention of an operator to acknowledge the alarm event and escalate to an appropriate level of management, even if the alarm has self-corrected. 3. Generate an automatic email notification to the Water Network Operations team each time a critical limit is exceeded 4. Include the requirement for correct escalation of CCP breaches and specific configuration / control details for chlorinators as part of competency training for all System Controllers. Hunter Water has also identified capital works to resolve the dosing system deficiencies. These capital works and are in the design phase. vi. Items 1 to 3 of the remedial actions were implemented in July 2016 when the non-compliances were identified. Item 4 will be implemented during the current reporting year with full compliance - expected in 2017-18.

D 2016-17 audit scope

2016-17 Operational Audit scope
Hunter Water Corporation

Contents

2016-17 audit scope

This scope is based on the 5-year audit program for Hunter Water's 2012-2017 Operating Licence. Auditors should note any directions in the comments column of Table 2.

Previous recommendations

Table 2 outlines outstanding audit recommendations. These recommendations are reviewed to determine progress and are reported on separately within the audit report.

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 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.

Development and implementation of management systems

Where a management system needs to be developed and/or implemented by a date outside the audit period, we have requested the utility provide a verbal update on progress during the audit interviews. The purpose is to inform us and the auditor of progress made toward developing an effective management system by the date set out in the licence.

We request that the auditor provides a summary of Hunter Water's progress, to date, on developing, certifying and implementing the management systems. This should include if, in the auditor's view, sufficient progress was made to meet the future licence requirement. This should be provided in the cover letter to the audit report.

Table 1 Key

Requirement	Meaning
Audit/Review	Audit/review clause in 2016-17
SC	We will rely on the utility's Statement of Compliance. All clauses require a Statement of Compliance unless there is a "no requirement" designation.
NR	No requirement (for audit or statement of compliance).

Table 2 2016-17 Audit scope for Hunter Water Corporation

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
1	Licence and Licence authorisation		
1.1	Objectives of this Licence		
1.1.1	The objective of this Licence is to enable and require Hunter Water to provide the Services within its Area of Operations. Consistent with this objective, this Licence requires Hunter Water to: a) meet the objectives and other requirements imposed on it in the Act and other applicable law; b) comply with the System Quality and Performance Standards; c) recognise the rights given to Customers and Consumers; and d) be subject to Operational Audits.	NR	
1.2	Licence authorisation		
1.2.1	This Licence is granted to enable and require Hunter Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems and Services for supplying water, providing sewerage Services, and disposing of Wastewater throughout the Area of Operations.	NR	
1.3	Provision of a drainage system		
1.3.1	Hunter Water must provide, operate, manage and maintain a drainage service as described in section 13(1)(b) of the Act.	NR	
1.4	Duration of Licence		
1.4.1	The term of this Licence is 5 years from the Commencement Date. [Note: This Licence starts on 1 July 2012, which means that it will end on 30 June 2017.]	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
1.5	Licence amendment		
1.5.1	Subject to the Act and condition 1.5.2, this Licence may be amended by the Governor by notice in the NSW Government Gazette. The amendment takes effect on the date the notice is published in the NSW Government Gazette, or on such other date specified in the notice.	NR	
1.5.2	Before any notice of an amendment to this Licence is published in the NSW Government Gazette, the Minister must give Hunter Water reasonable notice of the proposed amendment to enable it to comply with the amendment (if relevant) upon its commencement.	NR	
1.6	Connection of Services		
1.6.1	Subject to Hunter Water continuing to comply with any applicable law, Hunter Water must ensure that the Services are available on request for connection to any Property situated in the Area of Operations.	SC	
1.6.2	Connection to the Services is subject to any conditions Hunter Water may lawfully impose to ensure the safe, reliable and financially viable supply of the Services to Properties in the Area of Operations in accordance with this Licence.	NR	
1.7	Non-exclusive Licence		
1.7.1	This Licence does not prohibit another person from providing any 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	
1.8	Availability of Licence		
1.8.1	Hunter Water must make this Licence available free of charge: a) on its website for downloading by any person; and b) to the public on request.	SC	
1.9	Pricing		
1.9.1	Hunter Water must set the level of fees, charges, and other amounts payable for the Services subject to the terms of this Licence, the Act and the maximum prices and methodologies for the Services determined from time to time by IPART under the IPART Act.	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
2	Water Quality		
2.1	Drinking Water		
2.1.1	Hunter Water must maintain a Management System that is consistent with: a) the Australian Drinking Water Guidelines; or b) if NSW Health specifies any amendment or addition to the Australian Drinking Water Guidelines that applies to Hunter Water, the Australian Drinking Water Guidelines as amended or added to by NSW Health, (Drinking Water Quality Management System). [Note: It is generally expected that Hunter Water will develop a system consistent with the Australian Drinking Water Guidelines, including the Drinking Water Quality Framework. However, where NSW Health considers it appropriate, the application of those Guidelines may be amended or added to, to take account of Hunter Water's circumstances and/or Drinking Water Quality policy and practices within New South Wales.]	Audit	This clause was last audited in 2015-16 and was awarded High Compliance in that audit. Audit will include a risk based adequacy audit of the system, and implementation of the system. NSW Health was contacted by IPART to comment on compliance with this clause. NSW Health was generally happy with Hunter Water's overall performance.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
2.1.2	Hunter 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 system, including to the satisfaction of NSW Health.	Audit	Audit will include a risk based adequacy audit of the system, by element, and implementation of the whole system. Based on this risk assessment and in consultation with IPART, the auditor will then determine what elements of the ADWG will be the main focused of the audit. The scheme/ sites to be visited for field verification will be determined by auditor in consultation with IPART. This decision will also take into account any advice from NSW Health. Past field verification sites are listed in Table 4 IPART has written to NSW Health regarding its satisfaction with Hunter Water's management of Drinking Water Quality prior to audit. NSW Health was generally happy with Hunter Water's overall performance. NSW Health's submission has noted the following: ▼ Finalising CCPs and critical limits remains an issue; ▼ Adequacy of Ct and/or disinfection residuals within the distribution network need further investigation ▼ Review of protocols for managing PFAS contamination in the Tomago borefields is appropriate. In addition, Hunter Water has self-reported four instances of a non-compliance related to the timing of reporting to NSW Health of CCP breaches (short-term overdosing of chlorine) in the water network. Section 2.3 of the Reporting Manual requires Hunter Water to report these incidents in accordance with these protocols. This clause was last audited in 2015-16 and was awarded High Compliance in that audit.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
2.1.3	Hunter Water must notify IPART and NSW Health of any significant changes that it proposes to make to the Drinking Water Quality Management System in accordance with the Reporting Manual.	Audit	Change identified. In its report on 31 March 2017 Hunter Water advised there have been changes to the Critical Control Point limits for pH. NSW Health was contacted by IPART to comment on compliance with this clause. NSW Health was generally happy with Hunter Water's overall performance. NSW Health notes Hunter Water's progress in reviewing critical limits and operation against CCP's, but notes this work requires finalisation. It is expected that Hunter Water will complete this work in 2017-18.
2.1.4	Hunter Water must obtain NSW Health's approval for any significant changes proposed to be made to the Drinking Water Quality Management System before implementing or carrying out its activities in accordance with them.	Audit	Change identified. In its report on 31 March 2017 Hunter Water advised there have been changes to the Critical Control Point limits for pH. NSW Health was contacted by IPART to comment on compliance with this clause. NSW Health was generally happy with Hunter Water's overall performance. Refer to cl 2.1.3

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
2.2	Recycled Water		
2.2.1	Hunter Water must maintain a Management System that is consistent with: a) the Australian Guidelines for Water Recycling; or b) if NSW Health specifies any amendment or addition to the Australian Guidelines for Water Recycling that applies to Hunter Water, the Australian Guidelines for Water Recycling as amended or added to by NSW Health, (Recycled Water Quality Management System). [Note: It is generally expected that Hunter Water will develop a system consistent with the Australian Guidelines for Water Recycling, including the Recycled Water Quality Framework. However, where NSW Health considers it appropriate, the application of those Guidelines may be amended or added to, to take account of Hunter Water's circumstances and/ or Recycled Water Quality policy and practices within New South Wales.]	Audit	Audit will include a risk based adequacy audit of the system, and implementation of the system. We audit the utility's drinking water quality system, which is based on the AGWR framework. Elements of the framework and schemes to be audited will be determined by IPART in consultation with the auditors. Audit will be informed by consultation with NSW Health and outcomes of previous audits. NSW Health was contacted by IPART to comment on compliance with this clause. NSW Health was generally happy with Hunter Water's overall performance. This clause was last audited in 2015-16 and was awarded High Compliance in that audit.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
2.2.2	Hunter 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 system, including to the satisfaction of NSW Health.	Audit	Audit will include a risk based adequacy audit of the system, and implementation of the system. Based on this risk assessment and in consultation with IPART, the auditor will then determine what elements of the AGWR will be the main focused of the audit. The scheme/ sites to be visited for field verification will be determined by auditor in consultation with IPART. This decision will also take into account any advice from NSW Health. NSW Health was contacted by IPART to comment on compliance with this clause. NSW Health was generally happy with Hunter Water's overall performance. They noted Hunter Water's completion of the plans, and the need for rolling review to ensure currency and adequacy. This clause was last audited in 2015-16 and was awarded High Compliance in that audit.
2.2.3	Hunter Water must notify IPART and NSW Health of any significant changes that it proposes to make to the Recycled Water Quality Management System in accordance with the Reporting Manual.	Audit	Change identified. In its report on 31 March 2017 Hunter Water advised there have been changes made to CCPs to the satisfaction of NSW Health. NSW Health was contacted by IPART to comment on compliance with this clause. NSW Health was generally happy with Hunter Water's overall performance.
2.2.4	Hunter Water must obtain NSW Health's approval for any significant changes proposed to be made to the Recycled Water Quality Management System before implementing or carrying out its activities in accordance with them.	Audit	Change identified. In its report on 31 March 2017 Hunter Water advised there have been changes made to CCPs to the satisfaction of NSW Health. NSW Health was contacted by IPART to comment on compliance with this clause. NSW Health was generally happy with Hunter Water's overall performance.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
3	Water Quantity		
3.1	Water Conservation Target		
3.1.1	Hunter Water must ensure that the 5 year rolling average for annual residential water consumption calculated for each financial year during the term of this Licence is equal to or less than 215 kilolitres per year for each Property used for residential purposes (Water Conservation Target).	SC	
3.1.2	Hunter Water must report its compliance with the Water Conservation Target to IPART in accordance with the Reporting Manual.	SC	
3.2	Economic Level of Leakage		
3.2.1	By 31 January 2014, Hunter Water must: a) complete a review to determine the Economic Level of Leakage from its Drinking Water Network; and b) submit a report on this review to IPART in accordance with the Reporting Manual.	NR	
3.2.2	Hunter Water must provide to IPART, for its approval, the proposed methodology for determining the Economic Level of Leakage in accordance with the Reporting Manual.	NR	
3.2.3	When determining the Economic Level of Leakage from the Drinking Water Network for the purposes of condition 3.2.1, Hunter Water must use the methodology approved by IPART under condition 3.2.2.	SC	
3.3	Roles and responsibilities protocol		
3.3.1	Hunter Water must use its best endeavours to: a) develop and agree a Roles and Responsibilities Protocol with the Metropolitan Water Directorate for the development of the Lower Hunter Water Plan; and b) maintain and comply with any Roles and Responsibilities Protocol that has been agreed and developed under condition 3.3.1(a).	SC	A new protocol was executed in 2013-14. DPI Water is currently responsible for the Lower Hunter Water Plan. DPI Water will be contacted by IPART to comment on compliance with this clause
4	Assets		
4.1	Asset Management System		
4.1.1	Hunter Water must maintain a Management System that is consistent with: a) the BSI PAS 55:2008 (PAS 55) Asset Management standard; or b) the Water Services Association of Australia's Aquamark benchmarking tool; or c) another asset management standard agreed to by IPART, (Asset Management System).	Audit	This clause was last audited in 2015-16 and was awarded Full Compliance in that audit.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
4.1.2	Hunter Water must ensure that the Asset Management System is fully implemented and that all relevant activities are carried out in accordance with the system.	Audit	This clause was last audited in 2015-16 and was awarded High Compliance in that audit. Hunter Water has exceeded the Water Continuity Standard, and is non-compliant with its obligations under clause 4.2.3 of the Operating Licence 2012-2017. The occurrence of unplanned water outages is a result of the management of water infrastructure assets. The Water Continuity Standard is an indicator of performance, and we consider investigation is required to understand the reasons for exceedance.
4.1.3	Hunter Water must notify IPART of any significant changes that it proposes to make to the Asset Management System in accordance with the Reporting Manual.	Audit	In its report on 31 March 2017 Hunter Water advised it is making changes as it continues to transition and improve the Asset Management System.
4.2	Water pressure, water continuity and Wastewater Overflow Standards		
4.2.1	Interpretation of standards a) For the purposes of the Water Pressure Standard and Water Continuity Standard, each separately billed or separately occupied part of a Multiple Occupancy Property is considered to be 1 Property. [Note: for example, a block of 5 townhouses or apartments is counted as 5 Properties, and a block of land on which there is a house and a granny flat is counted as 2 Properties.] b) For the purposes of the Wastewater Overflow Standard, a Multiple Occupancy Property is considered to be 1 Property. [Note: for example, a block of 5 townhouses or apartments is counted as 1 Property, and a block of land on which there is a house and a granny flat is counted as 1 Property.] c) In the case of any ambiguity in the interpretation or application of any of the standards set out in this condition 4.2, IPART's interpretation of the relevant standard or assessment of its application will prevail.	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
4.2.2	Water Pressure Standard a) Hunter Water must ensure that no more than 4,800 Properties experience a Water Pressure Failure in a financial year (**Water Pressure Standard**). b) A Property is taken to have experienced a Water Pressure Failure at each of the following times: i) when a person notifies Hunter Water that the Property has experienced a Water Pressure Failure and that Water Pressure Failure is confirmed by Hunter Water; or ii) when Hunter Water's systems identify that the Property has experienced a Water Pressure Failure. c) Despite condition 4.2.2(b), a Property will not be taken to have experienced a Water Pressure Failure if that Water Pressure Failure occurred only because of: i) a Planned Water Interruption or Unplanned Water Interruption; ii) water usage by authorised fire authorities in the case of a fire; or iii) a short term or temporary operational problem (such as a main break) which is remedied within 4 days of its occurrence.	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
4.2.3	Water Continuity Standard a) Hunter Water must ensure that in a financial year: i) no more than 10,000 Properties experience an Unplanned Water Interruption that lasts more than 5 continuous hours; and ii) no more than 5,000 Properties experience 3 or more Unplanned Water Interruptions that each lasts more than 1 hour, (**Water Continuity Standard**). b) For the purposes of condition 4.2.3(a), Hunter Water must use the best available data (taking account of water pressure data where that data is available) to determine: i) whether a Property has experienced an Unplanned Water Interruption; and ii) the duration of the Unplanned Water Interruption. c) If a Property experiences an Unplanned Water Interruption that was caused by a third party, that Property is taken not to have experienced an Unplanned Water Interruption for the purposes of condition 4.2.3(a).	SC	Hunter Water has reported an exceedance of the Water Continuity Standard. The auditor will investigate the causes and adequacy of response for the exceedance under clause 4.1.2.
4.2.4	Wastewater Overflow Standard a) Hunter Water must ensure that in a financial year: i) no more than 5,000 Properties (other than Public Properties) experience an Uncontrolled Wastewater Overflow in dry weather; and ii) no more than 45 Properties (other than Public Properties) experience 3 or more Uncontrolled Wastewater Overflows in dry weather, (**Wastewater Overflow Standard**).	SC	
5	Customers and Consumers		
5.1	Customer Contract		
5.1.1	Hunter Water must publish a copy of the Customer Contract and any variations to it on Hunter Water's website for downloading free of charge, and must provide it to any Customer or Consumer free of charge upon request.	SC	
5.1.2	Hunter Water must notify IPART of any significant changes that it proposes to make to the Customer Contract in accordance with the Reporting Manual.	SC	Audit following any notice of change. In its report on 31 March 2017 Hunter Water advised there have been no significant changes.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
5.2	Providing information		
5.2.1	Hunter Water must prepare a pamphlet that: a) briefly explains the Customer Contract; b) summarises the key rights and obligations of Customers under the Customer Contract; c) refers to the types of account relief available for Customers experiencing financial hardship; d) outlines the Customer's obligations and rights to claim a rebate; and e) contains information about how to contact Hunter Water by telephone, email, postal mail or in person.	SC	
5.2.2	Hunter Water must update the pamphlet prepared under condition 5.2.1 when variations are made to the Customer Contract.	SC	
5.2.3	Hunter Water must provide the pamphlet prepared under condition 5.2.1 and any updates made under condition 5.2.2 free of charge to: a) Customers at least annually with their Bills; and b) any other person on request.	SC	
5.2.4	Hunter Water must advertise in a local newspaper at least once annually on: a) the types of account relief available for Customers experiencing financial hardship; b) the Customer's obligations and rights to claim a rebate.	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
5.3	Consumers		
5.3.1	Hunter Water's obligations under the Customer Contract relating to: a) complaint handling and complaint resolution procedures; and b) the Procedure for Payment Difficulties and Actions for Non-payment, are extended to Consumers as if Consumers were parties to the Customer Contract.	SC	
5.4	Procedure for financial hardship, payment difficulties, water flow restriction and disconnection		
5.4.1	Hunter Water must maintain and fully implement procedures relating to financial hardship, payment difficulties, water flow restriction and disconnection (Procedure for Payment Difficulties and Actions for Non-payment), which must include: a) a financial hardship policy that helps residential Customers experiencing financial hardship 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 Hunter Water's opinion, experiencing financial hardship; c) conditions for disconnection of supply or water flow restriction; and d) provisions for self-identification, identification by community welfare organisations and identification by Hunter Water of residential Customers experiencing financial hardship.	SC	
5.4.2	Hunter Water must set out the Procedure for Payment Difficulties and Actions for Non-payment in the Customer Contract.	SC	
5.4.3	Hunter Water must provide an explanation of the Procedure for Payment Difficulties and Actions for Non-payment free of charge to: a) residential Customers, at least annually with their Bills; b) residential Customers whom Hunter Water identifies as experiencing financial hardship; and a) any other person who requests it.	SC	
5.4.4	Hunter Water must publish the Procedure for Payment Difficulties and Actions for Non-payment on its website for downloading free of charge.	SC	
5.5	Consultative Forum		
5.5.1	Hunter Water must maintain and regularly consult with its Customers and Consumers through a Consultative Forum.	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
5.5.2	Hunter Water may utilise the Consultative Forum to, among other things, provide it with advice on the interests of Hunter Water's Customers and Consumers, the Customer Contract and such other key issues related to Hunter Water's planning and operations as Hunter Water may determine, consistent with the Consultative Forum Charter.	SC	
5.5.3	Hunter Water must: a) ensure that at all times the membership of the Consultative Forum is appointed and determined by Hunter Water in accordance with the Consultative Forum Charter; and b) use its best endeavours to include a person representing each of the following interests as members of the Consultative Forum: i) business and Consumer groups; ii) organisations representing low income households; iii) people living in rural and urban fringe areas; iv) residential Consumers; v) environmental groups; vi) local government; vii) older people; viii) people with disabilities; ix) Aboriginal people; and x) people from non-English speaking backgrounds.	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
5.5.4	Hunter Water and members of the Consultative Forum must for the term of this Licence maintain a charter (**Consultative Forum Charter**) that addresses all of the following issues: a) the role of the Consultative Forum; b) selection criteria on how members will be drawn from the community, and information on how vacancies for membership will be advertised; c) the procedure for appointment of members; d) the term for which members are appointed; e) information on how the Consultative Forum will operate; f) a description of the type of matters that will be referred to the Consultative Forum and how those matters may be referred; g) procedures for the conduct of Consultative Forum meetings, including the appointment of a chairperson; h) procedures for communicating the outcome of the Consultative Forum's work to Hunter Water; i) procedures for tracking issues raised and ensuring appropriate follow-up of those issues; and j) funding and resourcing of the Consultative Forum by Hunter Water.	SC	
5.5.5	Hunter Water must provide the Consultative Forum with information in its possession or under its control necessary to enable the Consultative Forum to discharge the tasks assigned to it, other than information or documents that are confidential or privileged.	SC	
5.5.6	Hunter Water must make: a) a copy of the Consultative Forum Charter; and b) minutes from proceedings of the Consultative Forum, available free of charge: c) on its website for downloading; and d) available at its offices for access or collection by any member of the public.	SC	
5.6	Internal Dispute Resolution Process		
5.6.1	Hunter Water must maintain a procedure for receiving, responding to and resolving Complaints, which is consistent with the Australian Standard AS ISO 10002-2006: Customer satisfaction - Guidelines for complaints handling in organizations (ISO 10002:2004, MOD) (**Internal Complaints Handling Procedure**).	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
5.6.2	Hunter Water must ensure that the Internal Complaints Handling Procedure is fully implemented and that all relevant activities are carried out in accordance with the procedure.	SC	
5.6.3	Hunter Water must provide to Customers at least annually with their Bills information concerning the Internal Complaints Handling Procedure which explains how to make a Complaint and how the Internal Complaints Handling Procedure works.	SC	
5.7	External dispute resolution scheme		
5.7.1	Hunter Water must be a member of the Energy and Water Ombudsman NSW for the resolution of disputes between Hunter Water and its Customers and its Consumers.	Audit	Audit of this clause will be undertaken by IPART. Excluded from Auditors' scope.
5.7.2	Hunter Water must: a) prepare a pamphlet that explains the operation of the dispute resolution service provided by the Energy and Water Ombudsman NSW including any rights to have a Complaint or dispute referred to the Energy and Water Ombudsman NSW and how it can be accessed; and b) provide that pamphlet: i) to Customers at least once a year with their Bills; and ii) free of charge to the public on request.	SC	
6	Environment		
6.1	Environmental Management		
6.1.1	By 30 June 2017, Hunter Water must develop a Management System which is consistent with the Australian Standard AS/NZS ISO 14001:2004: Environmental Management Systems - Requirements with guidance for use (Environmental Management System).	Audit	Certified on 22 October 2014. Check certification and external audit report.
6.1.2	Hunter Water must ensure that: a) by 30 June 2017, the Environmental Management System is certified by an appropriately qualified third party to be consistent with the Australian Standard AS/NZS ISO 14001:2004: Environmental Management Systems - Requirements with guidance for use; and b) once the Environmental Management System is certified under condition 6.1.2(a), the certification is maintained during the remaining term of this Licence.	Audit	Certified on 22 October 2014. Check certification has been maintained and external audit report.
6.1.3	Hunter Water must ensure that by 30 June 2017, the Environment Management System is fully implemented and that all relevant activities are carried out in accordance with the system	Audit	Certified on 22 October 2014. Check implementation.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
6.1.4	Until the Environmental Management System has been developed and certified in accordance with conditions 6.1.1 and 6.1.2, Hunter Water must: a) maintain programs to manage risks to the environment from carrying out its activities; and b) ensure that all its activities are carried out in accordance with those programs.	NR	
6.1.5	Hunter Water must notify IPART of any significant changes that it proposes to make to the Environmental Management System in accordance with the Reporting Manual.	SC	In its report on 31 March 2017 Hunter Water advised there have been no significant changes.
7	Quality		
7.1	Quality Management System		
7.1.1	By 30 June 2017, Hunter Water must develop a Management System that is consistent with the Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems – Requirements (Quality Management System).	Audit	Obligation met. Certified in August 2015. Check certification and external audit report.
7.1.2	Hunter Water must ensure that: a) by 30 June 2017, the Quality Management System is certified by an appropriately qualified third party to be consistent with the Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems – Requirements; and b) once the Quality Management System is certified under condition 7.1.2(a), the certification is maintained during the remaining term of this Licence.	Audit	Obligation met. Certified in August 2015. Check certification has been maintained and external audit report.
7.1.3	Hunter Water must ensure that by 30 June 2017, the Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the system.	Audit	Check implementation.
7.1.4	Hunter Water must notify IPART of any significant changes that it proposes to make to the Quality Management System in accordance with the Reporting Manual.	SC	
8	Performance monitoring		
8.1	Operational Audits		
8.1.1	IPART may undertake, or may appoint an Auditor to undertake, an audit on Hunter Water's compliance with: a) this Licence; b) the Reporting Manual; and c) any matters required by the Minister, (Operational Audit).	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
8.1.2	Hunter Water must provide IPART or any Auditor with all information in or under its possession, custody or control which is necessary to conduct the Operational Audit, including whatever information is reasonably requested by IPART or an Auditor.	SC	
8.1.3	Hunter Water must provide the information requested under condition 8.1.2 within a reasonable time of it being requested.	SC	
8.1.4	For the purposes of any Operational Audit or verifying a report on a Operational Audit, Hunter Water must, within a reasonable time of being required by IPART or an Auditor, permit IPART or the Auditor to: a) have access to any works, premises or offices occupied by Hunter 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, works or offices any person or equipment necessary for the purposes 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 Hunter Water that are maintained in relation to the performance of Hunter Water's obligations under this Licence; and e) discuss matters relevant to the Operational Audit or any report on the Operational Audit with Hunter Water, including any of Hunter Water's officers and employees.	SC	
8.2	Reporting		
8.2.1	Hunter Water must comply with its reporting obligations set out in the Reporting Manual, which include: a) reporting to IPART and NSW Health in accordance with the Reporting Manual, and b) making reports and other information publicly available, in the manner set out in the Reporting Manual.	SC	
8.2.2	Hunter Water must maintain sufficient record systems that enable it to report accurately in accordance with condition 8.2.1.	Audit	This clause was last audited in 2015-16 and was awarded High Compliance.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
8.3	Provision of Information		
8.3.1	If IPART requests that Hunter Water provide information relating to the performance of its obligations under condition 8.2, Hunter Water must provide the information requested within a reasonable time of IPART's request, including providing IPART with physical and electronic access to the records required to be kept under condition 8.2.	SC	
8.3.2	Hunter Water must provide IPART with such information as is reasonably required to enable IPART to conduct any review or investigation of Hunter Water's obligations under this Licence.	SC	
8.3.3	If Hunter Water contracts out any of its activities to third parties (including a subsidiary) it must take all reasonable steps to ensure that, if required by IPART or an Auditor, any such third parties provide information and do the things specified in this condition 8 as if that third party were Hunter Water.	SC	
8.3.4	If IPART or an Auditor requests information under this condition 8 which 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 confidential information remains confidential.	SC	
8.3.5	If NSW Health requests that Hunter Water provide information relating to water quality, Hunter Water must provide the information requested in the manner and form specified by NSW Health. Hunter Water must provide the information requested within a reasonable time of NSW Health's request. [Note: Under section 19 of the Public Health Act 2010 (NSW), the Director General of NSW Ministry of Health may require Hunter Water to produce certain information.]	SC	Audit if Hunter Water Statement of Compliance or NSW Health identifies information request. NSW Health will be contacted by IPART to comment on compliance with this clause, and/or inclusion in the scope.
8.4	Performance indicators		
8.4.1	a) Hunter Water must maintain sufficient record systems to enable it to measure accurately its performance against the performance indicators specified in the Reporting Manual. b) In the case of any ambiguity in the interpretation or application of any performance indicators specified in the Reporting Manual, IPART's interpretation or assessment of the indicators will prevail.	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
9	Memorandum of Understanding		
9.1	NSW Health		
9.1.1	Hunter Water must: a) use its best endeavours to maintain a Memorandum of Understanding with NSW Health; and b) comply with any Memorandum of Understanding maintained with NSW Health under condition 9.1.1(a).	SC	IPART will check with NSW Health and only audit if there are issues with maintaining and/or complying with the MoU. In its report on 31 March 2017 Hunter Water has not reported any changes. NSW Health was contacted by IPART to comment on compliance with this clause, and/or inclusion in the scope. NSW Health was generally happy with Hunter Water's overall performance.
9.1.2	The purpose of a Memorandum of Understanding is to form the basis for cooperative relationships between the parties to the memorandum. In particular, the purpose of the Memorandum of Understanding with NSW Health is to recognise NSW Health's role in providing advice to the NSW Government in relation to Drinking Water quality standards and the supply of water which is safe to drink.	NR	
9.1.3	The Memorandum of Understanding with NSW Health must include a procedure for Hunter Water to report to NSW Health any information or events in relation to any of Hunter Water's systems or Services which may have risks for public health.	SC	In its report on 31 March 2017 Hunter Water has not reported any changes.
9.1.4	Condition 9.1.1 does not limit the persons with whom Hunter Water may have a Memorandum of Understanding.	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
10	End of term review		
10.1	End of Term Review		
10.1.1	It is anticipated that a review of this Licence will commence in the first quarter of 2016 to investigate: a) whether this Licence is fulfilling its objectives; and b) any issues which have arisen during the term of this Licence, which may affect the effectiveness of this Licence, (End of Term Review). [Note: In the event that IPART undertakes the end of term review, IPART intends to: ▼ commence the end of term review (including undertaking public consultation) in the first quarter of 2016; ▼ report to the Minister by 30 April 2017 on: ▼ the findings of the end of term review, ▼ any recommendations for conditions to be included in a new Licence, and ▼ any recommendations for amending any law that adversely impacts on this Licence; and ▼ make the report to the Minister publicly available after the end of term review.]	NR	
10.1.2	Hunter Water must provide to the person undertaking the End of Term Review such information as is reasonably required to enable the person to undertake the End of Term Review.	NR	

Source: Hunter Water Corporation five year audit program.

Table 3 Recommendations / outstanding items from previous audits

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2013-14-03 2013-14-04 2013-14-06 2013-14-13	Water Quality Management Systems Conditions 2.1.1, 2.1.2, 2.2.1 & 2.2.2	Within 6 months, Hunter Water should review Critical Control Points (CCPs) for each treatment plant, including: a) review all CCP critical limits (including alarm delays), and monitoring points to ensure they reflect current practice, as agreed with NSW Health b) develop a process to ensure critical limits are only altered with supervisory consent and there is a failsafe process to ensure that they are reinstated before water quality is compromised c) revise and review CCP documentation to clearly state location, parameters, target criteria, monitoring frequency, critical limits, corrective actions and responsibilities for each CCP d) develop a process to record and document corrective actions, and preventive measures to reduce risks e) operational and critical limits must be set in SCADA as alarms, including delay times where appropriate.	**Drinking Water CCPs:** NSW Health noted that the CCPs are still to be finalized to its satisfaction and in its letter of 27 June 2016, noted that there are still compliance issues such as fluoride limits and confirmation of responses and response times to exceedances. In this audit's findings, there are also issues noted with the CCP limits, complexity of the 'HACCP' tables and gaps in the flow diagrams that may mean hazards and risks could be missed. The **update** from Hunter Water stated that Hunter Water has submitted revised CCP documentation for drinking water quality to NSW Health incorporating their previous feedback. Submission of the revised documentation was discussed at the March 2017 liaison meeting between NSW Health and Hunter Water. Hunter Water is awaiting a response from NSW Health on the revised CCP documentation. Completion Date will depend on feedback from NSW Health.	Auditor to check for completeness.

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
continued			**Recycled Water CCPs:** NSW Health confirmed that RWQMPs have been submitted by Hunter Water but are yet to be reviewed. A standard has been developed for establishing and reviewing recycled water CCPs. The procedure is consistent with the AGWR approach and clearly sets out responsibilities for decision-making. The validation testing program has been completed and appears to be sound and includes the correct parameters e.g. UV transmissivity for validating process unit 'fitness for purpose' and LRV_{10} credits. A Corporate RWQMP is in place and has been updated. The diagram of the Framework is incorrect – the supporting Requirements are those from the ADWG Framework – not the AGWR Framework. Flow diagrams include CCPs but do not have version control or include evidence of ground-truthing and sign-off. This process should have been conducted before the risk assessment and CCP process was conducted. The update from Hunter Water stated that CCPS have been reviewed, included in the Recycled Water Quality Management Plans and submitted to NSW Health. Hunter Water has received a letter indicating NSW Health's satisfaction. SCADA changes are currently being implemented. Due to be completed 30 June 2017.	

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2013/14-14 2013/14-12	Recycled Water Quality Management System Condition 2.2.2	Within 12 months, Hunter Water should review the following matters in respect to the Clarence Town Wastewater Treatment Works: – The effectiveness of the CCPs. If the corrective action can be undertaken in a timely manner, and it reduces risk, then implement the CCPs as soon as possible. – The risk assessment at Clarence Town Wastewater Treatment Works to take account of irrigation-water ponding at the site.	Component 1 of the recommendation is still ongoing noting that Hunter Water has submitted its system-specific RWQMPs to NSW Health by end June 2016 and is awaiting comment. The Veolia risk assessment now includes ponding of irrigation water. The date of the document is 21 March 2016. Only residual risk is reported, the AGWR Framework requires both inherent (Element 2) and residual risk (Element 3) risk to be assessed. However given that the event has been included, component two of the recommendation is completed and can be closed. Hunter Water's progress report since the 2015-16 audit states that The CCP for Clarence Town WWTW has been updated and will be further validated at the risk assessment scheduled for May 2017. Due to be completed by 30 June 2017.	Auditor to check completeness
2013/14-20	Asset Management System Condition 4.1.1	Hunter Water should continue implementing the five improvement initiatives identified as part of its 2012 Benchmarking Program including: – develop a holistic approach to asset maintenance – the complete capture of all asset and related maintenance information in its Ellipse Asset/ Maintenance Management System. (It was noted that these initiatives should be fully implemented by July 2017, consistent with Hunter Water's ISO 55001 implementation program).	Hunter Water's progress report since the 2015-16 audit states that Hunter Water is incorporating both initiatives into the creation of the Asset Management System which will be completed December 2017.	Auditor to check progress

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2014/15-01	Recycled Water Quality Management System Condition 2.2.2	It is recommended that Hunter Water commence the implementation of the interim CCPs as soon as possible and finalise validation program.	Hunter Water's progress report since the 2015-16 audit states that updated CCP's have been included in RWQMP. The validation program has been finalised with the exception of helminth control. The helminth control validation work is currently underway. SCADA updates are currently underway. Due to be completed 30 June 2017.	Auditor to check completeness
2014/15-02	Recycled Water Quality Management System Condition 2.2.2	It is recommended that Hunter Water finalise its validation program and facilitate endorsement of the outcomes by NSW Health. CCPs should then be adjusted or refined in accordance with the outcomes.	See comments for 2014/15-01. Hunter Water has received a letter from NSW Health showing satisfaction with the current state	Auditor to check completeness
2014/15-03	Asset Management System Condition 4.1.1	It is recommended that Hunter Water continues to fully implement improvement initiatives in respect of: – the development and implementation of a holistic approach to maintenance management – the complete capture of all asset and related maintenance information in its Enterprise Resource Planning (Asset/ Maintenance Management) System – criticality and condition assessment – review and update of operational and maintenance procedures across the whole of the asset portfolio.	Hunter Water's progress report since the 2015-16 audit states that Hunter Water is incorporating the required initiatives into the creation of the Asset Management System which will be completed December 2017.	Auditor to check progress

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2015/16 -01	Water Quality – Drinking Water Quality Management System (Clauses 2.1.1, 2.1.2)	By 30 June 2017, review all system process flow diagrams including all process steps, inputs, monitoring points, key characteristics, handover points between parties and raw water customers, to ensure that: each flow diagram matches the SCADA diagram, each flow diagram and SCADA diagram is signed off by someone with appropriate authority, and each flow diagram has associated version history and review cycle information.	Hunter Water's progress report since the 2015-16 audit states that draft flow diagrams have been prepared for all systems. Draft diagrams will be reviewed by the Water Quality Committee and are on track to be finalised by the due date.	Auditor to check completeness
2015/16 -02	Water Quality – Drinking Water Quality Management System (Clauses 2.1.1, 2.1.2)	By 30 June 2017, use the revised flow diagram to revise the risk assessment for Lemon Tree Passage Water Treatment Plant	Hunter Water's progress report since the 2015-16 audit states that the Lemon Tree Passage Water Treatment Plant risk assessment has been reviewed based on the draft flow diagram. A final review will be undertaken once the diagrams are finalised and is on track to be completed by the due date.	Auditor to check completeness
2015/16 -03	Water Quality – Drinking Water Quality Management System (Clauses 2.1.1, 2.1.2)	By 30 June 2017, review and revise documentation associated with the emergency management process including: Veolia's Crisis Management Plan, cross-referencing in the Hunter Water Emergency Management Plan, and the currency across all document history fields in Veolia's Incident Recording and Reporting procedure.	Hunter Water's progress report since the 2015-16 audit states that cross referencing in the Hunter Water Emergency Management Plan has been reviewed and updated as part of the annual review process. Veolia's emergency management documentation is on track to be updated by the due date.	Auditor to check completeness

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2015/16 -04	Water Quality – Recycled Water Quality Management System (Clauses 2.2.1, 2.2.2)	By 30 June 2017, Hunter Water should review the implementation of recommendations from its Environmental Compliance Audit for the Karuah Effluent Reuse Enterprise, and develop appropriate deadlines for any recommendations that have not been addressed.	Hunter Water's progress report since the 2015-16 audit states that the review of the implementation status of recommendation from the Environmental Compliance Audit for the Karuah Effluent Reuse Enterprise has been completed. Several actions from the audit were identified as being completed. Deadlines for addressing remaining outstanding audit actions will be determined by 30 June 2017.	Auditor to check completeness
2015/16 -05	Water Quality – Recycled Water Quality Management System (Clauses 2.2.1, 2.2.2)	By 30 June 2018, Hunter Water should ensure that a gap analysis is completed of all RWQMPs, against the Framework for Management of Recycled Water Quality and Use. Particular focus should be given to the gaps in compliance areas detailed in the 2015-16 audit report.	Hunter Water's progress report since the 2015-16 audit states that Hunter Water has commenced the gap analysis of the RWQMP's and has completed a number of actions including improvement to risk assessment processes and flow diagram validation. The gap analysis is on track to be completed before 30 June 2018.	Auditor to check progress
2015/16 -06	Assets – Asset Management System implementation (Clause 4.1.2)	By 31 December 2017, review the Asset Standards Management Plan and the Asset Class Management Plans, which were overdue for review. Ensure all Asset Class Management Plans meet Hunter Water's document control system.	Hunter Water's progress report since the 2015-16 audit states that both these actions are proceeding and on track to be completed by 31 December 2017. Hunter Water has reviewed the Asset Standards Management Plan and is currently finalising the revised plan for approval. Hunter Water is creating Asset Class Management Plan standard and procedures, with the specific plans to be update to meet the standards and Hunter Water's document control system by December 2017, where required.	Auditor to check progress

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2015/16 -07	Performance monitoring - Maintain record systems (Clause 8.2.2)	By 30 June 2017, Hunter Water should ensure all compliance related documents are consistent with Hunter Water's procedure for managing document control.	Hunter Water's progress report since the 2015-16 audit states that the standard and procedure for managing document control are being updated to provide a more robust process. Documents will be finalised and awareness to employees conducted by 30 June 2017. Hunter Water is also pursuing opportunities to replace its current Document Control technology with a more fit for purpose solution.	Auditor to check completeness

Source: Hunter Water - Status of Recommendations – 2015-16 Operational Audit, Letter and Report received by IPART on 31 March 2017.

Table 4 Previous field verification locations for Hunter Water Corporation

Audit year	Location	Facility
2016-17	To be announced	To be announced
2015-16	Tomago Sandbeds	Borefields
	Lemon Tree Passage	Water Treatment Plant
	Karuah	Wastewater Treatment Plant and the reuse enterprise
	Boulder Bay	Wastewater Treatment Plant
2014-15	Edgeworth	Wastewater Treatment works
	KIWS (Kooragang Industrial Water Scheme), incl. Mayfield West plant	Advanced water treatment plant (recycled water)
	Grahamstown	Spillway
		Water treatment plant
	Campvale	Pump station
2013-14	Chichester	Dam
	Dungog	Water treatment plant
	Clarence	Sewage treatment plant
	Boags Hill	Inlet
	Seaham	Weir
2012-13	Branxton	Recycled water treatment plant
	Grahamstown	Water treatment plant
2011-12	Port Stephens	Lemon Tree Passage Water Treatment Plant
	Grahamstown	Dam
	Campvale	Pumping station
	Between Newcastle and Port Stephens	Tomago Sandbeds
	Karuah	Sewage treatment plant
2010-11	Dungog	Water treatment plant
	Grahamstown	Water treatment plant
	n/a	Service reservoirs and storages
	n/a	Work sites – mains replacement and burst mains repair