Water Futures

Cobbitty Consulting
Engineering and Advisory Services

Sydney Desalination Plant

2024 Operational Audit

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2024 Operational Audit

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1. Executive Summary

1.1 Auditor Declaration

This report presents the findings of an Operational Audit of Sydney Desalination Plant Pty Ltd's compliance with the requirements of its Network Operator's Licence (Licence No: 10_010) and the relevant provisions of the *Water Industry Competition (General) Regulation 2021* as they relate to the drinking water (seawater desalination) scheme at Kurnell.

The auditor confirms that:

- the auditor was provided with sufficient evidence on which to base the conclusions reached during the audit;
- the audit findings accurately reflect the professional opinion of the auditor;
- the auditor has conducted the audit, determined the audit findings and prepared this report in accordance with the requirements of the *WIC Act Audit Guidelines*[1] and the provisions of the *Audit Services Panel Agreement*;[2]; and
- the audit findings have not been unduly influenced by the Licensee and/or any of its associates and express the auditor's opinion as to whether the Licensee has met the Licence conditions and regulatory requirements as specified in the scope.

1.2 Major Findings

The Sydney Desalination Plant (SDP) has been operating successfully throughout the audit period. The Licensee, Sydney Desalination Plant Pty Ltd, was found to have operated and maintained the drinking water scheme at Kurnell, to the extent applicable under the prevailing operating regime, in compliance with the assessed audit criteria (no design or construction activities were undertaken during the audit period).

1.3 Recommendations

No recommendations have been made in respect of the audited obligations from this audit.

No opportunities for improvement have been identified in respect of the audited obligations.

Two observations were highlighted, as noted in the body of the report.

[1] IPART, *Audit Guideline; under the Water Industry Competition Act 2006*, July 2020.
[2] IPART, *Audit Services; Panel Agreement* between IPART and Water Futures dated 25 May 2023.

2. Introduction

2.1 Objectives

This report presents the findings of an Operational Audit undertaken for the Independent Pricing and Regulatory Tribunal (IPART) under the provisions of the *Water Industry Competition Act 2006*.

The objective of the audit was to assess compliance of the Licensee, Sydney Desalination Plant Pty Ltd (Sydney Desalination Plant or SDP), in meeting the requirements of the relevant legislation (the *Water Industry Competition Act 2006* and *Water Industry Competition (General) Regulation 2021*) and its Network Operator's Licence (Licence No: 10_010) as they relate to the drinking water (seawater desalination) scheme at Kurnell.

2.2 Licensee's Infrastructure, Systems and Procedures

The infrastructure, systems and procedures subject to audit are those related to the Sydney Desalination Plant located at Kurnell, approximately 17 kilometres south of the Sydney CBD, which desalinates seawater to produce drinking water for Sydney, when required (refer http://www.sydneydesal.com.au/). The Water Industry Infrastructure comprises:

- the treatment plant, which uses coagulation-flocculation and direct dual media filtration, two-pass reverse osmosis, chlorine disinfection, stabilisation and fluoridation processes to produce a high-quality drinking water; and
- appurtenant infrastructure including the:
  - seawater intake (inlet tunnel);
  - brine discharge (outlet tunnel);
  - drinking water tank;
  - drinking water pumping station; and
  - Kurnell to Erskineville pipeline.

Sydney Desalination Plant Pty Ltd (ACN 125 935 177) is the Licensee, holding Network Operator's Licence No: 10_010. As Licensee, Sydney Desalination Plant owns and is responsible for the ongoing operation and maintenance of the treatment plant and appurtenant infrastructure in accordance with its management plans (Licence Plans). Versions of the management plans that were in place during the audit period include:

- Infrastructure Operating Plan:
  Sydney Desalination Plant, *Infrastructure Operating Plan*, including:
  - Revision 7, August 2022;
  - Revision 8, August 2023; and
  - Revision 9, August 2024
- Water Quality Plan:
  Sydney Desalination Plant, *Water Quality Plan*, including:
  - Revision 8, August 2022;
  - Revision 9, August 2023; and
  - Revision 10, August 2024.

From an operational perspective, the Sydney Desalination Plant has "…*provided operational support to Sydney Water by increasing water supply during times when significant maintenance tasks are being carried out in the supply network*".[3] It has produced and supplied water each month at the request of Sydney Water (its sole customer).

It is noted that Sydney Desalination Plant has entered into three long-term contracts with Veolia Water Australia (VWA or Veolia) for the operation and maintenance of the desalination plant, drinking water pumping station, and the Kurnell to Erskineville pipeline.[4] Under this arrangement, the majority of operation and maintenance management documentation (manuals, procedures, etc.) is provided and maintained by Veolia. For the purposes of this report, this documentation is typically referenced as having been provided by Sydney Desalination Plant.

2.3 Audit Method

2.3.1 Audit Scope

The audit comprised an Operational Audit conducted pursuant to the *WIC Act Audit Guidelines*.[5] The specific scope of the audit was as defined in IPART's letter to Sydney Desalination Plant (reference D24/21461) dated 17 September 2024; the nominated scope addresses selected requirements of:

- the *Water Industry Competition (General) Regulation 2021*; and
- Network Operator's Licence No: 10_010.

The audit period (period during which compliance has been assessed) is 19 September 2022 to 27 September 2024.

2.3.2 Audit Standard

The audit has been undertaken in accordance with the principles/guidance presented in:

- ISO 19011:2018 *Guidelines for auditing management systems*; and
- IPART, *Audit Guideline; under the Water Industry Competition Act 2006*, July 2020 (WIC Act Audit Guidelines).

2.3.3 Audit Steps

The audit has been undertaken generally in accordance with the procedure outlined in the *WIC Act Audit Guidelines*.

Following approval of an *Audit Proposal* by IPART, *Information Requests* were sent to the Licensee prior and post the audit fieldwork being undertaken. The Licensee provided information in response to the requests, which was reviewed by the auditor prior to and following conducting the audit fieldwork.

Audit fieldwork comprising a site inspection of the existing infrastructure followed by review and discussion (audit) of relevant documentation/records was undertaken on 29 November 2024.

[3] Sydney Desalination Plant website at: https://sydneydesal.com.au/about-us/our-mission/.
[4] *Infrastructure Operating Plan*, section 1.2.2 and 1.2.4.
[5] IPART, *Audit Guideline; under the Water Industry Competition Act 2006*, July 2020.

Some additional items of information and/or clarification were requested following the audit fieldwork and subsequently provided.

A draft audit report was prepared and submitted to both the Licensee and IPART for review/comment, before being finalised and issued to both the Licensee and IPART.

The audit process involved seeking objective evidence that the Licensee had complied with the obligations identified for audit by IPART. Evidence was obtained through interview, review of relevant documentation and records, and site inspection.

2.3.4 Audit Team

The audit was conducted by Dr Dan Deere and a peer/quality assurance review was undertaken by Jim Sly. Both auditors hold relevant Lead Auditor accreditation on IPART's Technical Services and Water Licensing Panel.

Sydney Desalination Plant was represented by:

- SDP team:
  - Reece Karamihas – General Manager Operations; and
  - Jeremy Myers – Operations and Maintenance Manager.
- Veolia team:
  - Amid Akhyani – Operations Manager;
  - Linda Nappa – Process Manager; and
  - Jovan Raskovic – Asset Engineer.

IPART representatives present as observers during the audit fieldwork included:

- Sachin Singh – Senior Analyst;
- Vincent Nyugen – Graduate Analyst; and
- Christine Allen – Director, Regulation and Compliance (part).

2.3.5 Audit Grades

Audit grades have been awarded in accordance with guidance presented in the *WIC Act Audit Guidelines*. The compliance grades applicable for the purposes of this audit were as identified in **Table 2.1**.

Table 2.1 Audit Compliance Grades

Compliance Grade	Description
 **Compliant**	Sufficient evidence is available to confirm that the requirements have been met.
 **Non-compliant (non-material)**	Sufficient evidence is not available to confirm that the requirements have been met and the deficiency does not adversely impact the ability of the Licensee to achieve defined objectives or assure controlled processes, products or outcomes.
 **Non-compliant (material)**	Sufficient evidence is not available to confirm that the requirements have been met and the deficiency does adversely impact the ability of the Licensee to achieve defined objectives or assure controlled processes, products or outcomes.
 **No Requirement**	There was no requirement for the Licensee to meet this criterion during the audit period.

2.4 Regulatory Regime

The Sydney Desalination Plant drinking water scheme operates in accordance with the provisions of a Network Operator's Licence (Licence No: 10_010) issued under the *Water Industry Competition Act 2006* (NSW). Other relevant regulatory instruments and standards/guidelines include:

- *Water Industry Competition (General) Regulation 2021 (NSW)*;
- IPART, *Audit Guideline; under the Water Industry Competition Act 2006*, July 2020;
- *Australian Drinking Water Guidelines 2011(as amended September 2022)*;
- *Plumbing Code of Australia*;
- *Plumbing and Drainage Act 2011 (NSW)*; and
- NSW and national water industry and environmental regulations and codes of practice as applicable.

2.5 Quality Assurance Process

The quality of this audit report was assured through a professional review process. The report has been independently reviewed by a Lead Auditor who holds relevant accreditation on IPART's Technical Services and Water Licensing Panel.

2.6 Audit Findings

Audit findings are summarised in the following **Sections 3** to **5**, and are presented in full detail in **Appendices A** to **C**.

3. Water Quality

3.1 Summary of Findings

There were no identified non-compliances in respect of the audited clauses of the *Water Industry Competition (General) Regulation 2021* and the *Network Operator's Licence* related to *Water quality* (refer to **Appendix A** for detailed audit findings).

3.2 Review of Actions

The Licensee has not made any suggestions for corrections or clarifications following issue of the draft report and prior to the final report being issued.

IPART requested further details be provided to more explicitly cite the evidence relied upon during the audit, and to utilise a format more similar to that used for previous audits. The audit report, and its format, was amended accordingly.

3.3 Opportunities for Improvement

No opportunities for improvement have been identified in respect of the audited *WIC Regulation* and *Network Operator's Licence* clauses related to *Water quality*.

4. Infrastructure and Water Production

4.1 Summary of Findings

There were no identified non-compliances in respect of the audited clauses of the *Water Industry Competition (General) Regulation 2021* and the *Network Operator's Licence* related to *Infrastructure* and *Water Production* (refer to **Appendix B** for detailed audit findings).

4.2 Review of Actions

The Licensee has not made any suggestions for corrections or clarifications following issue of the draft report and prior to the final report being issued.

IPART requested further details be provided to more explicitly cite the evidence relied upon during the audit, and to utilise a format more similar to that used for previous audits. The audit report, and its format, was amended accordingly.

4.3 Opportunities for Improvement

No opportunities for improvement have been identified in respect of the audited *WIC Regulation* and *Network Operator's Licence* clauses related to *Infrastructure* or *Water Production*.

5. Reporting and Incident Notification

5.1 Summary of Findings

There were no identified non-compliances in respect of the audited clauses of the *Network Operator's Licence* and the *Water Industry Competition (General) Regulation 2021* related to *Reporting and incident notification* (refer to **Appendix C** for detailed audit findings).

5.2 Review of Actions

The Licensee has not made any suggestions for corrections or clarifications following issue of the draft report and prior to the final report being issued.

IPART requested further details be provided to more explicitly cite the evidence relied upon during the audit, and to utilise a format more similar to that used for previous audits. The audit report, and its format, was amended accordingly.

5.3 Opportunities for Improvement

No opportunities for improvement have been identified in respect of the audited *Network Operator's Licence* and *WIC Regulation* clauses related to *Reporting and incident notification*.

Appendix A Detailed Audit Findings – Water Quality

Detailed audit findings in respect of the obligations related to *Water quality* are presented in this Appendix.

Table A.1 Water Quality – WIC Reg Sch 1 cl.7(4)(a)

Clause	Requirement	Compliance Grade
WIC Reg Sch 1 cl.7(4)(a)	The licensee must ensure that the licensee's water quality plan is fully implemented and kept under regular review and that all of the licensee's activities are carried out in accordance with the plan.	**Compliant**

Risk

This requirement reflects a high operational risk. Implementation of the *Water Quality Plan* ensures that the water supplied complies with the specified quality requirement. Regular review ensures that the *Plan* remains current and reflects the current circumstances of the scheme.

Target for Full Compliance

Evidence that the *Water Quality Plan* is fully implemented, and that the Licensee's activities are carried out in accordance with the *Plan*; evidence that the *Plan* is kept under regular review.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Site inspection of infrastructure at the Sydney Desalination Plant on 29 November 2024.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 10, August 2024.
- Sydney Desalination Plant, *Infrastructure Operating Plan*, Revision 9, August 2024.
- URL: https://sydneydesal.com.au/wp-content/uploads/2023/06/SDP-Water-Quality-Policy_December-2022_signed-00076214-2xCE34F.pdf
- Document: *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), Veolia, section 17, 15/03/2022.
- Email: *Update from Amid*, *Veolia Mail - Update from Amid.pdf*, Veolia, 16/8/2024.
- Document: *SDP-SW Operating Protocol Appendix 1: Contacts and Communications Matrix*, Sydney Desalination Plant, 13/10/2023.
- Document: *Notifications to NSW Health*, *Table 6-1: Primary Contacts*, Sydney Desalination Plant, undated.
- Document: *2024 WQ Risk Assessment Briefing Paper Rev 1 - Kurnell.pdf*, Veolia, 13/11/2024.
- Workbook: *6-TEM-8928 Kurnell Risk Register_Water Quality 20241125 Update.xlsx*, Veolia, 25/11/2024.
- Document: *(1) Kurnell HACCP and WQ risk assessment workshop 2022.12.02 - Minutes (1).pdf*, Veolia, 02/12/2022.
- Document: *(2) Kurnell HACCP Analysis (Decision Tree Outcomes)- 2022.12.02 (1).pdf*, Veolia, 02/12/2022.
- Document: *Sydney Desalination Plant - RO Train Conductivity and LRV Analysis.pdf*, Veolia, undated.
- Workbook: *8 - TEM-8930-HACCP Register.xlsx*, Veolia, 28/11/2024.
- Document: *CCP Page.PNG*, Veolia, 29/11/2024.
- Screenshot: *BMS Live*, Veolia, 29/11/2024.

- Document: *Determination of Fluoride by ISE – Kurnell*, Veolia, 21/11/2024.
- Document: *Determination of Fluoride by ISE Work Instruction*, Veolia, 28/10/2024.
- Screenshot: *Response Procedure _ CCP6.PNG*, Veolia, 29/11/2024.
- Document: *VAMS overview page.PNG*, Veolia, 29/11/2024.
- Screenshot: *CCP6 Fluoride cal WO.pdf*, Veolia, 07/02/2024.
- Photo: *20241205_141037.jpg*, Veolia, 05/12/2024.
- Photo: *20241205_141042.jpg*, Veolia, 05/12/2024.
- Photo: *20241205_141046.jpg*, Veolia, 05/12/2024.
- Document: *HachCOARequest_021817.pdf*, Hach, 5/7/2022.
- Document: *I_[2024-08-05] Internal Laboratory Results (Published on 2024-08-08 12_33 by ELOISE).pdf*, Veolia, 08/08/2024.
- Document: *VAMS New Asset Details PMP51614-00 (E-KUR90843).pdf*, Veolia, 29/05/2023.
- Document: *VAMS New Asset Details PMP51624-00 (E-KUR90844).pdf*, Veolia, 29/05/2023.
- Document: *VAMS New Asset Details PMP51634-00 (E-KUR90845).pdf*, Veolia, 29/05/2023.
- Email: *Veolia Mail - CRF399 - Upgrade of Fluoride Dosing Pumps - VAMS change required.pdf*, Veolia, 29/05/2023.
- Screenshot: *DWT Roof inspection.PNG,* Veolia, 10/7/2024.
- Screenshot: *Screen grab of Feb 2020 report.PNG*, McLennans Diving Service, 12/2/2020.
- Screenshot: *DWT 5 yearly WO for next inspection.PNG*, Veolia, 29/11/2024.
- Screenshot: Corrective work order- repair rotating vent.PNG, Veolia, 29/11/2024.
- Document: *Sydney's Desalination Plant Attachment to O and M Report, Asset Management Report,* Veolia, 30/10/2024.
- Screenshot: *VAMS SWI PMP21340 refurb.PNG*, Veolia, 29/11/2024.
- Document: *20230206 Premium Hydrated lime.pdf*, Boral, 06/02/2023.
- Premium Hydrated Lime Impurity Conc_04-02-2023.xlsx, Veolia 04/02/2023.
- Workbook: *(2024-05-02)_ZVEOLIA_DS_304140_240501 (1).csv*, Veolia, 02/05/2024.
- Document: *(2024-05-02)_ZVEOLIA_DS_COC_240507_M.pdf*, Sydney Water, 07/052024.
- Document: *(2024-05-02)_ZVEOLIA_DS_304140_240501 (1).pdf*, Sydney Water, 02/05/2024.
- Document: *Minutes - SDP Operations Oct 24.pdf*, Sydney Water, 31/10/2024.
- Document: *Minutes SDP-SW Water Supply Review Group Meeting Aug 2024.PDF*, Sydney Water, 07/08/2024.
- Document: *SDP Invoice Information 10 2024(1).PDF*, Sydney Desalination Plant, October 2024.
- Document: *SDP KPI Monthly Performance Report October 2024(1).PDF*, Sydney Desalination Plant, October 2024.
- Document: *Attachment 1 - Monthly Report - Oct 2024.docx.PDF*, Veolia, 04/11/2024.
- Document: *Attachment 9 - Water Quality Graphs [Oct-2024].PDF*, Veolia, 04/11/2024.

- Workbook: *Attachment 9 - WQ monthly laboratory results (Oct-2024)(Statistics).csv*, Veolia, 04/11/2024.
- Screenshot: *CRF_459_signed as completed.PNG*, Veolia, 21/01/2021.
- Screenshot: *Change made as part of new testing schedule (Communicated to SDP, SW and NSW Health during workshop on 202212215).PNG*; 15/12/2020.
- Screenshot: Screenshot of meeting minutes detailing that change will be made as part of new testing schedule.PNG, Sydney Desalination Plant, 21/07/2022.
- Document: *Notifications to NSW Health*, *Table 6-1: Primary Contacts*, Sydney Desalination Plant, undated.
- Screenshot: *NSW Health Notification Protocol.png*, Sydney Desalination Plant, 09/01/2024.
- Screenshot: *SWC Notification Protocol.png*, Sydney Desalination Plant, 29/11/2024.
- Document: *Internal memo - April 2024 Ramp Up performance.PDF*, Veolia, 15/05/2024.
- Document: *Internal memo - August 2024 Ramp Up performance v1.PDF*, Veolia, 21/08/2024.
- Document: *Kurnell PIRMP Test 24092024.pdf*, Veolia, 24/09/2024.
- Email: *Example of ICAM email to staff.pdf*, Veolia, 08/11/2024.
- Document: Extract of training matrix for operator.PNG, Veolia, 08/04/2024.
- Presentation: *MAN - 9768-Kurnell HACCP Awareness.pptx*, Veolia, 08/04/2024.
- Document: *MAN-9768- Kurnell HACCP Awareness_ Operator Competency Assessment.pdf*, Veolia, 08/04/2024.
- Document: *Completed Assessment HACCP_David Towle.pdf*, Veolia, 14/03/2024.
- Document: *Training Attendance Register 20240314.pdf*, Veolia, 14/03/2024.
- URL: Sydney Desalination Plant website at https://sydneydesal.com.au/.
- URL: Water Research Australia WaterVal website at https://members.waterra.com.au/WaterVal
- Document: *Minutes - SDP Operations Oct 24.pdf*, Sydney Water, 31/10/2024.
- Document: *Minutes SDP-SW Water Supply Review Group Meeting Aug 2024.PDF*, Sydney Water, 07/08/2024.
- Document: *SDP FY24 Annual Production Request Summary - IPART Notification - Signed.PDF*, Sydney Desalination Plant, 16/07/2024.
- Document: *SDP Tech Audit 8 - Obsolescence Management - FINAL.pdf*, Beca HunterH2O, 22/11/2024.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that it had fully implemented and carried out its activities in accordance with the arrangements detailed in the *Water Quality Plan*. This was evident from the effective implementation of the documented arrangements in relation to the twelve elements of the *Australian Drinking Water Guidelines*, including (for example) ensuring that the system analyses (including hazard identification and risk assessment) remained up to date; water quality operational and verification monitoring was effectively implemented; and that short-term analysis of performance was undertaken (principally through monthly internal reporting).

Sydney Desalination Plant also demonstrated that it has kept the *Water Quality Plan* under regular review.

Accordingly, Sydney Desalination Plant is assessed to have demonstrated compliance with this obligation.

Discussion and notes

Overview:

The auditor checked for evidence that the *Water Quality Plan* was being fully implemented and kept under regular review and that all the Network Operator's activities were carried out in accordance with the *Plan*.

Consistent with the scope defined by IPART, the audit considered implementation of the arrangements in relation to all elements of the framework provided by the *Australian Drinking Water Guidelines*.

Element 1 – Commitment to drinking water quality management:

Drinking water policy:

Both Sydney Desalination Plant and Veolia (scheme operator) have Water Quality Policies in place. The Sydney Desalination Plant *Water Quality Policy* (for example), which was sighted during the audit interviews, was last updated on 13 December 2022. A copy of the *Water Quality Policy* is displayed on the site office noticeboard and on the Sydney Desalination Plant website.[6]

Sydney Desalination Plant/Veolia noted that the *Water Quality Policy* is addressed in induction training for all site staff (although evidence of this was not sought for the purposes of this audit).

Regulatory and formal requirements:

The Network Operator's Licence was updated during the audit period to reflect changes to the operating rules. Changes arising from the Licence changes were initiated by Sydney Desalination Plant and managed by Veolia in accordance with its Change Management Plan detailed in Veolia's IBMS (*Integrated Business Management System Manual*).[7] This ensured that the full impact of the change was fully addressed. Specifically, from 1 July 2023, the Plant formally shifted to flexible full-time operation with production requests issued by Sydney Water depending on network needs. Under the revised Network Operator's Licence, SDP must meet flow requests as specified by Sydney Water in accordance with the operational protocol that seek to achieve the following:

- To maximise yield contribution of the Sydney Desalination Plant to Sydney's water supply and slow the depletion rate during drought.
- Operate SDP and other water filtration plants to reduce the risk of dam spill where practical.
- Allow Sydney Water and SDP flexibility to respond to system shocks, outages and maintenance in accordance with good operating practice.

Veolia staff were briefed on these changes to explain that the new Operations and Maintenance Contract and Operating Rules were now in place.[8]

Engaging stakeholders:

Sydney Desalination Plant maintains a register of its principal stakeholders and their contact details (names, roles, positions, telephone, email, and notification requirements), including Sydney Water[9] and NSW Health.[10] This demonstrates that Sydney Desalination Plant has maintained current contact details for relevant stakeholders during the audit period.

[6] URL: https://sydneydesal.com.au/wp-content/uploads/2023/06/SDP-Water-Quality-Policy_December-2022_signed-00076214-2xCE34F.pdf
[7] Document: *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), Veolia, section 17, 15/03/2022.
[8] Email: *Update from Amid*, *Veolia Mail - Update from Amid.pdf*, Veolia, 16/8/2024.
[9] Document: *SDP-SW Operating Protocol Appendix 1: Contacts and Communications Matrix*, Sydney Desalination Plant, 13/10/2023.
[10] Document: *Notifications to NSW Health*, *Table 6-1: Primary Contacts*, Sydney Desalination Plant, undated.

Element 2 – Assessment of the drinking water supply system:

Water supply system analysis:

There have been no material changes to the Sydney Desalination Plant drinking water system during the audit period. It is assessed that the system analysis, as documented in the management plans, remained current during the audit period.

Veolia illustrated how a team is assembled annually to undertake a risk assessment review. The flow diagram and other pertinent information was assembled into a briefing paper to support the risk assessment, including during 2024.[11]

Assessment of water quality data:

Sydney Desalination Plant undertakes regular testing of source water (seawater) and treated water quality as part of its monitoring program. Sydney Desalination Plant used a *Briefing Paper*[12] to present a detailed assessment of water quality data. Veolia illustrated how this historical SCADA data, and internal and external laboratory data was collated, synthesised, trended, and presented for the risk assessment briefing paper. Exceedances were noted and explained. Monitoring data presented included online (via SCADA) monitoring of (for example) turbidity and an extensive program laboratory testing comprising daily, weekly, fortnightly, monthly, quarterly and annual analyte groups.

Hazard identification and risk assessment:

Sydney Desalination Plant provided the most recent *Risk Assessment/Risk Register*,[13] which is presented in a standard Veolia template. It also outlined the review process that had been undertaken during the audit period, which centred around using a briefing paper to inform the risk assessment workshop.[14] This *Briefing Paper* demonstrates the detailed background information that is provided for undertaking a risk assessment. Information provided includes a process description; a detailed assessment of water quality data; a discussion of preventative measures/multiple barries and critical control points; identification of current and emerging issues; and details the incidents and debrief actions, emergencies, lessons learnt and notifications to NSW Health.

It is apparent that the risk assessment had been reviewed and updated during the audit period.

Element 3 – Preventive measures for drinking water quality management:

Preventative measures and multiple barriers:

Veolia illustrated how the risk assessment, covering the methodology, hazards, hazardous events, inherent and residual levels of risk, uncertainty, and preventive measures, was revised annually, which is recorded in the *Risk Assessment/Risk Register*.[15] There have been no changes to the preventive measures/barriers implemented in respect of the production of drinking water during the audit period.

Critical control points:

Veolia illustrated how the Critical control points (CCPs) were documented in the *Water Quality Plan*,[16] along with mechanisms for operational control, critical limits and target criteria, and periodically revised, including during 2024. The information was summarised in the SCADA system, on instrument displays in the field, and in the treatment plant operations and laboratory areas. Sydney Desalination Plant has four (4) CCPs. During the audit period, Sydney Desalination Plant has reclassified what were previously CCPs 1, 2 and 7 as Operational Control Points (OCPs) and Quality Control Points (QCPs). A formal process was undertaken to review and revise the CCP allocation, including a risk assessment,[17]

[11] Document: *2024 WQ Risk Assessment Briefing Paper Rev 1 - Kurnell.pdf*, Veolia, 13/11/2024.
[12] Document: *2024 WQ Risk Assessment Briefing Paper Rev 1 - Kurnell.pdf*, Veolia, 13/11/2024.
[13] Workbook: *6-TEM-8928 Kurnell Risk Register_Water Quality 20241125 Update.xlsx*, Veolia, 25/11/2024.
[14] Document: *2024 WQ Risk Assessment Briefing Paper Rev 1 - Kurnell.pdf*, Veolia, 13/11/2024.
[15] Workbook: *6-TEM-8928 Kurnell Risk Register_Water Quality 20241125 Update.xlsx*, Veolia, 25/11/2024.
[16] *Water Quality Plan*, appendix B.
[17] Document: *(1) Kurnell HACCP and WQ risk assessment workshop 2022.12.02 - Minutes (1).pdf*, Veolia, 02/12/2022.

assessment of barriers using a CCP decision tree,[18] and an assessment of treatment barrier performance.[19] The CCPs have retained their former numbers:

Critical Control Point	Parameters Monitored with Critical Limits
CCP3 Outlet of Combined Reverse Osmosis	Combined permeate conductivity (online)
CCP4 Downstream of Re-mineralisation Loop	Combined remineralisation pH (online) Combined remineralisation turbidity (online)
CCP5 Drinking Water Tank Outlet	Drinking water (pre ammonia) free chlorine concentration (online)
CCP6 Delivery Point at Pump Station	Drinking water fluoride concentration (online)

Warning and critical limits for CCP parameters that are monitored online via the SCADA system are documented in the *HACCP Register*.[20] A review of settings in the SCADA system (captured on a series of screenshots)[21] confirmed that both limit settings and associated time delays are consistent with those documented in the *HACCP Register*.

This indicates that CCP parameters were being implemented in accordance with the documented arrangements.

Element 4 – Operational procedures and process control:

Operational procedures:

Operation of the Sydney Desalination Plant is undertaken under the umbrella of Veolia's Business Management System.[22] An extensive range of standard operating procedures are retained on the system and were viewed during the field audit; these are as illustrated on the screenshot. In each case, these procedures provide extensive background and procedural guidance in respect of the processes they address. An example was reviewed in detail for the fluoridation CCP.[23,24]

Operation and maintenance of the infrastructure is further discussed in Table B.1 (in respect of WIC Reg Sch 1 cl.6(2)(a)).

Operational monitoring:

Sydney Desalination Plant undertakes an extensive range of operational monitoring comprising of both continuous online monitoring via the SCADA system (more than 10,000 water quality parameters are monitored across the various processes implemented across the plant) and both internal and external laboratory analysis of grab samples for daily, weekly, fortnightly, monthly, quarterly and annual analyte groups.

Considering online monitoring of CCP parameters as noted above (in respect of Element 3), review of limit settings in the SCADA system confirmed that they were consistent with the limits documented in the *HACCP Register*. A check between a sample of instrument readings for CCP parameters monitored at the Drinking Water Pumping Station Discharge (turbidity, pH, conductivity, total chlorine, monochloramine, alkalinity and fluoride) and those displayed in the SCADA system confirmed that values were consistent, as noted below under *Equipment capability and maintenance*.

Veolia illustrated how the operational monitoring, corrective actions and escalation processes required at CCPs and OCPs are documented,[25] and periodically revised, including during 2024.[26] The

[18] Document: *(2) Kurnell HACCP Analysis (Decision Tree Outcomes)- 2022.12.02 (1).pdf*, Veolia, 02/12/2022.
[19] Document: *Sydney Desalination Plant - RO Train Conductivity and LRV Analysis.pdf*, Veolia, undated.
[20] Workbook: *8 - TEM-8930-HACCP Register.xlsx*, Veolia, 28/11/2024.
[21] Document: *CCP Page.PNG*, Veolia, 29/11/2024.
[22] Screenshot: *BMS Live*, Veolia, 29/11/2024.
[23] Document: *Determination of Fluoride by ISE – Kurnell*, Veolia, 21/11/2024.
[24] Document: *Determination of Fluoride by ISE Work Instruction*, Veolia, 28/10/2024.
[25] Workbook: *8 - TEM-8930-HACCP Register.xlsx*, Veolia, 28/11/2024.
[26] Document: *(1) Kurnell HACCP and WQ risk assessment workshop 2022.12.02 - Minutes (1).pdf*, Veolia, 02/12/2022.

information was summarised in the SCADA system, on instrument displays in the field, and in the treatment plant operations and laboratory areas.

Corrective action:

Corrective actions in respect of (for example) CCP exceedances of warning or critical limits are identified in the *Water Quality Plan*[27] and *HACCP Register*. Implementation of corrective action in response to online monitoring follows response procedures, for instance in response to elevated fluoride.[28]

Equipment capability and maintenance:

Equipment capability is maintained through routine monitoring and maintenance, which includes daily inspection and performance monitoring and undertaking both scheduled and corrective maintenance. The implementation of these activities is discussed below, and again in Table B.1 (in respect of WIC Reg Sch 1 cl.6(2)(a)).

An important aspect of equipment capability and maintenance from a process control perspective is ensuring that monitoring instruments are regularly calibrated. Veolia illustrated on site during the audit how the Veolia Asset Management System (VAMS) Computerised Maintenance Management System (CMMS) worksheet-based scheduling system covered scheduled maintenance, reactive works, calibration, reagents, and replacement.[29]

Examples were provided of instrument calibration and reagent currency control, managed using a worksheet system. Third party calibration records were reviewed on site during the audit. The CCP6 fluoridation monitoring instrument was calibrated 23/9/24 at 13:25 (with results entered 26/9/24 into a job record). A record of a more recent fluoridation monitoring instrument calibration was provided as a record.[30] During the field audit the fluoride reagents in the laboratory (0.2, 1 and 2 mg/L solutions) were checked for their currency, and found to be in date and appropriately stored (being lot A3107 Exp Apr-26;[31] lot A2103 Exp May-27;[32] lot A4106 Exp Apr-29,[33] respectively, along with the relevant certificate of analysis[34]).

Instrument performance and scaling was assessed on the day of the field audit for pre potabilisation: field (10 am) vs. SCADA (10:58 am): turbidity 0.011 vs. 0.01 NTU; pH 5.45 vs. 5.45; and conductivity 24.32 vs. 24 µS/cm, respectively. Scaling was also assessed on the day of the field audit for the final water wet rack: field vs. SCADA: fluoride (10:16 am) 1.01 vs. 1.01 mg/L; free chlorine (10:20 am) 1.78 vs. 1.80 mg/L, respectively. These results were well-aligned, noting that the plant was not running during the inspection.

The daily monitoring data capture log sheet was very detailed, and showed on site laboratory data from both benchtop and ICP monitoring. These were viewed in the field during the audit, and another was saved as evidence.[35] The writing was clear in the primary records, which were transcribed into a worksheet that had conditional formatting to highlight results of interest. The system was effective. As an Observation it was noted that the daily monitoring data capture log sheet had boxes that were too small for comfortable hand-written data entry. Data was being entered at 45˚ by some operators; or was written horizontally but crammed in. The results were legible, but Veolia was advised of this sub-optimal capture arrangement.

[27] *Water Quality Plan*, appendix B.
[28] Screenshot: *Response Procedure _ CCP6.PNG*, Veolia, 29/11/2024.
[29] Document: *VAMS overview page.PNG*, Veolia, 29/11/2024.
[30] Screenshot: *CCP6 Fluoride cal WO.pdf*, Veolia, 07/02/2024.
[31] Photo: *20241205_141037.jpg*, Veolia, 05/12/2024.
[32] Photo: *20241205_141042.jpg*, Veolia, 05/12/2024.
[33] Photo: *20241205_141046.jpg*, Veolia, 05/12/2024.
[34] Document: *HachCOARequest_021817.pdf*, Hach, 5/7/2022.
[35] Document: *I_[2024-08-05] Internal Laboratory Results (Published on 2024-08-08 12_33 by ELOISE).pdf*, Veolia, 08/08/2024.

Examples of asset creation were observed. This included replacement of the fluoride dosing pumps in March and April 2023 with new assets were created in VAMS for those.[36,37,38,39] The reports illustrated monitoring and management of those assets. The PMs and refurbishments were triggered by knowledge of asset age (15 years), temperature, vibration analysis, visual inspection, and sound.

The annual general "Drinking Water Tank Roof Inspection" was illustrated as a scheduled and completed task.[40] This was scheduled for the window 13/2/23 to 14/4/23, and completed 9 May 2023. The inspection found some corroded gutter clips and a seized whirlybird, and VAMS recorded the corrective works, e.g. "Repair rotating vent on top of Drinking Water". The job was overdue, but a new system has been put in place to help keep jobs on track.

Five-yearly inspections were illustrated for the treated water storage tank that holds potabilised free chlorinated water pre ammoniation.[41,42] This was completed February 2020, and another one is due shortly. The previous report showed detailed inspection of whirly birds and static ventilators and other common failure sites.

Many outdoor structures, such as roofs, including the treated water storage tank roof, were in good condition, being relatively new, (post the 2017 tornado). Additional 'ad hoc' inspections were illustrated post storms, with an example illustrated for a whirlybird replacement following a storm.[43]

From July 2024, monthly reports have been provided on preventive maintenance activities (PMs) delivered according to asset management key performance indicators (KPIs).[44] Maintenance is reported within its scheduled date plus some grace (20 business days. Penalty points are generated for overdue maintenance. The penalty points add up. The objective is for 80% or more tasks to be on schedule for works in general, and 100% for compliance tasks (e.g. pressure vessel PMs)). Progress against this scheduled asset management has been reported monthly.

There has been no major new infrastructure installed, other than swap-outs and similar small changes. During the audit, the five raw water pumps were being refurbished,[45] with one of the pumps observed during the field audit as being currently out of service for proactive maintenance.

Observations made during the audit site inspection supported an assessment that equipment capability had been maintained during the audit period.

Materials and chemicals:

No new infrastructure was constructed during the audit period. Nonetheless, it was apparent from the audit site inspection that infrastructure materials were appropriate to their use. For example, drum screens at the seawater intake were of stainless-steel construction and were fitted with cathodic protection anodes. The condition of the anodes was being monitored; they had been replaced on one unit and were due for replacement on the second unit.

Chemical storage and associated labelling (sulphuric acid, ferric chloride, and sodium hypochlorite), fill points and bunding were inspected. The bunds were installed to meet the relevant Australian standard. Some rain had blown into the bunds, which was pumped out once it reached levels of concern, as observed based on daily site walks.

Chemicals were observed to be appropriately stored in secure bunded compounds, with clear labelling in place. Safety showers/eyewashes and MSDS (material safety data sheets) were available adjacent to each compound.

[36] Document: *VAMS New Asset Details PMP51614-00 (E-KUR90843).pdf*, Veolia, 29/05/2023.
[37] Document: *VAMS New Asset Details PMP51624-00 (E-KUR90844).pdf*, Veolia, 29/05/2023.
[38] Document: *VAMS New Asset Details PMP51634-00 (E-KUR90845).pdf*, Veolia, 29/05/2023.
[39] Email: *Veolia Mail - CRF399 - Upgrade of Fluoride Dosing Pumps - VAMS change required.pdf*, Veolia, 29/05/2023
[40] Screenshot: *DWT Roof inspection.PNG,* Veolia, 10/7/2024.
[41] Screenshot: *Screen grab of Feb 2020 report.PNG*, McLennans Diving Service, 12/2/2020.
[42] Screenshot: *DWT 5 yearly WO for next inspection.PNG*, Veolia, 29/11/2024.
[43] Screenshot: Corrective work order- repair rotating vent.PNG, Veolia, 29/11/2024.
[44] Document: *Sydney's Desalination Plant Attachment to O and M Report, Asset Management Report,* Veolia, 30/10/2024.
[45] Screenshot: *VAMS SWI PMP21340 refurb.PNG*, Veolia, 29/11/2024.

Some minor concrete coating damage due to sulphuric acid splashes was pointed out by Veolia, along with evidence of repairs where this has become significant.

Veolia demonstrated the process for checking chemicals received against contractual specifications. Veolia illustrated how, during the audit period, it had compared certificates of analysis against a Recommended Maximum Impurity Content (RMIC) calculation tool, with conditional formatting in case of non-compliances.

The lime was reviewed in detail, as this is dosed in large amounts post filtration. To provide high quality water the lime provided is of a high grade (currently Boral premium hydrated lime from the Marulan quarry) and is supplied via a lime saturator. A change in supplier had been effectively managed. An example of an assessment of lime quality was provided showing testing of metals being checked against the RMIC,[46] along with a certificate of analysis from Boral.[47]

Element 5 – Verification of drinking water quality:

Drinking water quality monitoring:

As discussed below, and again in Table A.2 (in respect of Network Operator's Licence Sch B cl.8.1), verification monitoring in respect of the quality of drinking water produced by the Sydney Desalination Plant forms part of the extensive program of internal and external laboratory monitoring. Verification monitoring involves laboratory testing of grab samples against a series of parameters; these appear to have all been implemented during the audit period.

This three-tier level of checking (in-house laboratory, third party laboratory, and SCADA), and high frequency of testing (online SCADA, and up to daily laboratory) provides a reliable and representative testing regime.

Veolia illustrated its water quality monitoring program and scheduling system, which is not a LIMS (enterprise Laboratory Information Management System), but is operated to achieve the same outcome. Veolia illustrated examples of primary .csv files from Sydney Water Laboratories that are readily accessed via the intranet,[48] and then read into the Veolia water quality dataset. Veolia showed summaries of monitoring from Sydney Water Laboratories, including primary PDF 'certificate of analysis'[49] and 'chain of custody'[50] documents. This includes NATA certification credentials, and time, location, and date of the sample and analytical results. This was integrated with in-house laboratory and SCADA data.

Consumer satisfaction:

Sydney Desalination Plant has a single customer, i.e. Sydney Water. Consumers of the water produced by the Sydney Desalination Plant are customers of Sydney Water; accordingly, consumer satisfaction is monitored in the first instance by Sydney Water. It is noted that, although consumer satisfaction is not specifically addressed, the matters discussed by the two parties (water quality; system performance and flow) ultimately impact consumer satisfaction.

Sydney Desalination Plant maintains regular liaison with Sydney Water. Sydney Desalination Plant provided evidence of its detailed monthly and annual customer reports, and its monthly, quarterly and annual meetings, and the way in which these performance reports are related to invoicing, and by which Sydney Desalination Plant retains a close relationship with its customer.[51,52,53,54] Within these reports, results of performance relevant to customer satisfaction are reported, both at monthly frequencies, and on an exceedance basis, to Sydney Water. The reports clearly illustrate exceedances.

[46] Document: *20230206 Premium Hydrated lime.pdf*, Boral, 06/02/2023.
[47] Premium Hydrated Lime Impurity Conc_04-02-2023.xlsx, Veolia 04/02/2023.
[48] Workbook: *(2024-05-02)_ZVEOLIA_DS_304140_240501 (1).csv*, Veolia, 02/05/2024.
[49] Document: *(2024-05-02)_ZVEOLIA_DS_COC_240507_M.pdf*, Sydney Water, 07/052024.
[50] Document: *(2024-05-02)_ZVEOLIA_DS_304140_240501 (1).pdf*, Sydney Water, 02/05/2024.
[51] Document: *Minutes - SDP Operations Oct 24.pdf*, Sydney Water, 31/10/2024.
[52] Document: *Minutes SDP-SW Water Supply Review Group Meeting Aug 2024.PDF*, Sydney Water, 07/08/2024.
[53] Document: *SDP Invoice Information 10 2024(1).PDF*, Sydney Desalination Plant, October 2024.
[54] Document: *SDP KPI Monthly Performance Report October 2024(1).PDF*, Sydney Desalination Plant, October 2024.

Short-term evaluation of results:

As discussed above (in respect of Element 4) and in Table A.2, Sydney Desalination Plant undertakes an extensive range of operational and verification monitoring, which it continually reviews and analyses. Documentation provided above (Element 4) and below (Element 6) in respect of warning setpoint exceedances, and in Table C.1 in respect of critical limit exceedances/reportable incidents demonstrate that performance measures are being continually monitored and evaluated.

Any exceedances of third-party laboratory, in-house, or SCADA limits are illustrated and explained in the detailed monthly reports illustrated by Veolia, including an overarching monthly report,[55] plots of the data,[56] and summary statistics as a file.[57] A summary assessment and details of performance against CCP and other water quality parameters is provided with commentary as appropriate.

Corrective action:

Implementation of corrective action in response to verification monitoring results are thorough owing to their reporting to Sydney Water. A root cause analysis is completed, with an example of a formal Management of Change made in liaison with Sydney Water and NSW Health to respond to elevated total coliforms, that involved moving from using *E. coli* to enterococci for verification testing.[58,59,60]

Element 6 – Management of incidents and emergencies:

Communication:

Sydney Desalination Plant maintains a register of its principal stakeholders and their emergency contact details (names, roles, positions, telephone, email, and notification requirements), including Sydney Water[61] and NSW Health.[62] Explicit notification protocols have been developed for NSW Health[63] and Sydney Water[64] that define a number of conditions under which notification, shut down, or changes to operation are required. This demonstrates that Sydney Desalination Plant has maintained current contact details for incident-related contact points during the audit period.

Incident and emergency response protocols:

Sydney Desalination Plant and Veolia illustrated their incident and emergency response system, including running mock exercises. This includes examples of typical triggers and process flow diagrams to guide responses and notification requirements relating to most reasonably foreseeable incidents. The principal parties to be notified are IPART, NSW Health and Sydney Water. If required, public notification is via Sydney Water. In most cases the incident response is to ramp up supply to back up the water supply, since most water quality failures at the Sydney Desalination Plant failsafe and default to off-spec and/or shut down. An example of such a ramp up incident during April 2024 was provided, with a detailed report post the event illustrating the lessons learnt and preparedness for future incidents.[65] As part of readiness response, readiness and ramp up tests were also conducted in the period 1-15 August 2024, involving Sydney Desalination Plant and Sydney Water.[66] An example of a mock exercise was summarised from July 2024, albeit an evacuation drill, and not a water quality incident.[67]

[55] Document: *Attachment 1 - Monthly Report - Oct 2024.docx.PDF*, Veolia, 04/11/2024.
[56] Document: *Attachment 9 - Water Quality Graphs [Oct-2024].PDF*, Veolia, 04/11/2024.
[57] Workbook: *Attachment 9 - WQ monthly laboratory results (Oct-2024)(Statistics).csv*, Veolia, 04/11/2024.
[58] Screenshot: *CRF_459_signed as completed.PNG*, Veolia, 21/01/2021.
[59] Screenshot: *Change made as part of new testing schedule (Communicated to SDP, SW and NSW Health during workshop on 202212215).PNG*; 15/12/2020.
[60] Screenshot: Screenshot of meeting minutes detailing that change will be made as part of new testing schedule.PNG, Sydney Desalination Plant, 21/07/2022.
[61] Document: *SDP-SW Operating Protocol Appendix 1: Contacts and Communications Matrix*, Sydney Desalination Plant, 13/10/2023.
[62] Document: *Notifications to NSW Health*, *Table 6-1: Primary Contacts*, Sydney Desalination Plant, undated.
[63] Screenshot: *NSW Health Notification Protocol.png*, Sydney Desalination Plant, 09/01/2024.
[64] Screenshot: *SWC Notification Protocol.png*, Sydney Desalination Plant, 29/11/2024.
[65] Document: *Internal memo - April 2024 Ramp Up performance.PDF*, Veolia, 15/05/2024.
[66] Document: *Internal memo - August 2024 Ramp Up performance v1.PDF*, Veolia, 21/08/2024.
[67] Document: *Kurnell PIRMP Test 24092024.pdf*, Veolia, 24/09/2024.

These examples demonstrate that incident and emergency response protocols have been implemented as applicable, and that training has been undertaken, during the audit period.

Element 7 – Employee awareness and training:

Employee awareness and involvement:

Veolia illustrated its systematic process for delivering training and assessing awareness. Major changes, such as the changes to the Operating Rules, were shown to be communicated via toolbox talks and briefings. Veolia uses emails to make staff aware of minor changes that don't require formal training. Veolia illustrated examples of how notifications are provided, and read receipts are retained, using this system. If there is a CCP change, all staff need to be aware of it, and this email system is used to formally notify staff, and record read receipts as acknowledgement that the advice has been recieved. An example was provided of the posting of email communication following an Incident Cause Analysis Method (ICAM) recommendation to change the ammonia startup pumps interlock arrangements.[68]

Employee training:

Veolia has a training matrix for each operator that records required competencies and their status.[69] Of most relevance to water quality, Veolia demonstrated its formal HACCP Training package,[70] that includes a competency assessment module.[71,72,73] Staff attendance is registered and trainees sign to record their attendance.[74]

These examples demonstrate that employee awareness was maintained, and training undertaken during the audit period.

Element 8 – Community involvement and awareness:

Community consultation:

Public facing 'consultation' is largely a function of Sydney Water since Sydney Desalination Plant does not have a direct public-facing role.

Communication:

Sydney Desalination Plant advised that some broader communication with the community is undertaken informally. For example, tours of the treatment plant are provided for local schools, Rotary clubs, universities, etc. The Sydney Desalination Plant website,[75] which can be accessed by members of the community, provides information about the plant and its operation. During the audit Sydney Desalination Plant showed that it had set up excellent infographics for educational purposes at the plant, with Sydney Desalination Plant supporting study tours. This level of engagement was considered sufficient.

Element 9 – Research and development:

Investigation of studies and research monitoring:

Sydney Desalination Plant participates in a range of forums, both as presenters and attendees, including (for example) as a member of the International Desalination Association and attendance at annual Ozwater conferences. Veolia Australia participates in internal learning and development workshops in conjunction with its international colleagues.

[68] Email: *Example of ICAM email to staff.pdf*, Veolia, 08/11/2024.
[69] Document: Extract of training matrix for operator.PNG, Veolia, 08/04/2024.
[70] Presentation: *MAN - 9768-Kurnell HACCP Awareness.pptx*, Veolia, 08/04/2024.
[71] Document: *MAN-9768- Kurnell HACCP Awareness_ Operator Competency Assessment.pdf*, Veolia, 08/04/2024.
[72] Document: *MAN-9768- Kurnell HACCP Awareness_ Operator Competency Assessment - Answers.pdf*, Veolia, 08/04/2024.
[73] Document: *Completed Assessment HACCP_David Towle.pdf*, Veolia, 14/03/2024.
[74] Document: *Training Attendance Register 20240314.pdf*, Veolia, 14/03/2024.
[75] URL: Sydney Desalination Plant website at https://sydneydesal.com.au/.

Validation of processes:

Validation of processes was achieved through pilot plant testing prior to construction of the treatment plant. Veolia illustrated how historical SCADA data, and internal and external laboratory data was collated, synthesised, and presented for the risk assessment briefing paper, as part of continual review and improvement (discussed under Elements 1 to 3 for the 25/11/24 risk assessment review).

Veolia and SDP reviewed and revised its CCPs and their validation during 2022, taking into consideration the then-current state of knowledge (discussed under Elements 1 to 3). This included the use of WaterVal evidence on chlorination.[76]

Extensive monitoring of performance, as discussed previously in respect of Elements 4 & 5 and in Table A.2 (in respect of Network Operator's Licence Sch B cl.8.1), provides effective ongoing validation of the treatment processes being employed.

Design of equipment:

Except for business-as-usual refurbishment/replacement of equipment, there was no significant equipment installation during the audit period. Notwithstanding, any capital investment is subject to the preparation and submission of a business case by Veolia (as operator) to Sydney Desalination Plant for approval. Where appropriate, such business cases include an evaluation of options and their suitability.

Element 10 – Documentation and reporting:

Management of documentation and records:

Veolia demonstrated its electronic Business Management System (BMS) for documents and records. A new Google BMS has been created which is already operational. All documents and records have been migrated across. The previous BMS is now 'read only' and will be closed down post 31 December 2024. The system included version control and management systems.

The 'point of truth' was the online version. Documents are updated on a needs basis. Veolia illustrated examples of documents in the BMS during the audit. The system was easy to search using keywords and Google logic. As an observation, the speed of the intranet could be improved.

Reporting:

Sydney Desalination Plant provided evidence of its detailed monthly and annual reports to Sydney Water, and its monthly, quarterly and annual meetings, and the way in which these performance reports are related to invoicing.[77,78,79,80] In addition, Sydney Desalination Plant provides reports on water production to IPART,[81] as discussed again in detail in Table C.1 (in respect of Network Operator's Licence Sch B cl.6).

Element 11 – Evaluation and audit:

Long-term evaluation of results:

Veolia illustrated how historical SCADA data, and internal and external laboratory data was collated, synthesised, trended, and presented for the risk assessment briefing paper annually as part of annual risk assessment, review, and continual review and improvement, and as observed for the 25/11/24 risk assessment review (as discussed under Elements 1-3). Monthly reporting on water quality data is used to inform ongoing management and improvement (as discussed under Element 10).

Audit of drinking water quality management:

Sydney Desalination Plant and Veolia illustrated multiple auditing processes. This included Sydney Desalination Plant engaging a third-party auditor, and Veolia conducting its internal and external certified safety, health, environmental, asset management and quality system audits. In addition, special targeted audits are undertaken. An example of a recent Sydney Desalination Plant-commissioned specialist technical audit of obsolescence management processes was provided.[82]

Element 12 – Review and continual improvement:

Review by senior executive:

Sydney Desalination Plant provided evidence of its detailed monthly and annual customer reports, that are reviewed by the Sydney Desalination Plant Executive (as described under Element 10). Results are reported, both at monthly frequencies, and on an exceedance basis, to the Executive.

This demonstrates extensive review of operations at senior management level.

Drinking water quality management improvement plan:

Veolia illustrated how historical SCADA data, and internal and external laboratory data was collated, synthesised, trended, and presented for the risk assessment briefing paper annually, as part of annual risk assessment, review, and continual review and improvement (discussed under Elements 1-3).

Regular Review of Water Quality Plan:

Sydney Desalination Plant demonstrated that the *Water Quality Plan* has been kept under regular review. The "Document History" table indicates that it was updated on two occasions, nominally annually, during the audit period: in August 2023 (Revision 9) and August 2024 (Revision 10).

On this basis, it is apparent that the *Water Quality Plan* has been kept under regular review during the audit period.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[76] URL: Water Research Australia WaterVal website at https://members.waterra.com.au/WaterVal
[77] Document: *Minutes - SDP Operations Oct 24.pdf*, Sydney Water, 31 October 2024.
[78] Document: *Minutes SDP-SW Water Supply Review Group Meeting Aug 2024.PDF*, Sydney Water, 07/08/2024.
[79] Document: *SDP Invoice Information 10 2024(1).PDF*, Sydney Desalination Plant, October 2024.
[80] Document: *SDP KPI Monthly Performance Report October 2024(1).PDF*, Sydney Desalination Plant, October 2024.
[81] Document: *SDP FY24 Annual Production Request Summary - IPART Notification - Signed.PDF*, Sydney Desalination Plant, 16/07/2024.
[82] Document: *SDP Tech Audit 8 - Obsolescence Management - FINAL.pdf*, Beca HunterH2O, 22/11/2024.

Table A.2 Water Quality – Network Operator's Licence Sch B cl.8.1

Clause	Requirement	Compliance Grade
Network Operator's Licence Sch B cl.8.1	The Licensee must undertake any monitoring that is required for the purposes of this Licence, any Plan, the Act or the Regulation in accordance with this clause B8.	**Compliant**

Risk	Target for Full Compliance
This requirement reflects a high operational risk. It is essential that monitoring is undertaken to ensure that the quality of treated effluent (recycled water) complies with the required standards, thereby minimising any risk to public health.	Evidence that the required monitoring has been undertaken in accordance with the requirements of the Licence, Plans, the Act and the Regulation.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Site inspection of infrastructure at the Sydney Desalination Plant on 29 November 2024.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 10, August 2024.
- Sydney Desalination Plant, *Infrastructure Operating Plan*, Revision 9, August 2024.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that monitoring was undertaken in accordance with the requirements set out in the Licence, and in the *Water Quality Plan*. Records of operational monitoring, including online monitoring and the results of internal and external laboratory testing, are presented. These records indicate that monitoring has been undertaken as planned.

Accordingly, Sydney Desalination Plant is assessed to have demonstrated compliance with this obligation.

Discussion and notes

Overview:

Monitoring requirements, which include a wide range of both operational monitoring and verification monitoring, are documented in the *Water Quality Plan*. These monitoring arrangements include online monitoring and both internal and external laboratory testing.

Operational Monitoring:

Completion of the operational monitoring described under the *Water Quality Plan* is discussed in detail under Element 4 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)). Briefly summarising, this comprises both online monitoring of treatment plant performance and predominantly internal laboratory testing of samples taken at nominated operational control points.

Online monitoring is undertaken continuously by instruments monitoring (for example) each critical control point (CCP) parameter, as well as other process/quality control parameters. Performance is monitored online via the telemetry/SCADA system, with records maintained in the Plant Historian (part of the SCADA system). Performance is reported by Veolia to Sydney Desalination Plant, and then by Sydney Desalination Plant to Sydney Water, on a monthly, annual, and by exception basis, as noted under Element 10 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)).

On this basis, it is assessed that operational monitoring was undertaken in accordance with the documented requirements throughout the audit period.

Verification Monitoring:

Completion of the verification monitoring described under the *Water Quality Plan* is discussed in detail under Element 5 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)). Briefly, this includes daily, weekly, fortnightly, monthly, two-monthly, quarterly and annual internal and external laboratory testing at a number of sample locations including (for example) the Drinking Water Pumping Station and Shaft 11, the point of delivery to Sydney Water. External testing required for validation of internal test results are specifically identified. Performance is reported by Veolia to Sydney Desalination Plant, and then by Sydney Desalination Plant to Sydney Water, on a monthly, annual, and by exception basis, as noted under Element 10 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)).

On this basis, it is assessed that verification monitoring was undertaken in accordance with the documented requirements throughout the audit period.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

Table A.3 Water Quality – Network Operator's Licence Sch B cl.8.2

Clause	Requirement	Compliance Grade
Network Operator's Licence Sch B cl.8.2	The Licensee must keep the following records of any samples taken for monitoring purposes specified in the Water Quality Plan: a) the date on which the sample was taken; b) the time at which the sample was collected; c) the point or location at which the sample was taken; and d) the chain of custody of the sample (if applicable).	**Compliant**

Risk

This requirement reflects a high operational risk. It is essential that detailed sample records are maintained to ensure traceability in the event of a non-compliance.

Target for Full Compliance

Evidence that the required records have been kept in respect of collected samples.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Site inspection of infrastructure at the Sydney Desalination Plant on 29 November 2024.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 10, August 2024.
- Sydney Desalination Plant, *Infrastructure Operating Plan*, Revision 9, August 2024.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that the required records are kept in respect of water quality samples taken for monitoring purposes. All requisite information is included on *Chain of Custody* records (Sydney Water standard format). Review of a corresponding *Analytical Reports* confirmed that sample details are consistent with those provided on the *Chain of Custody* records.

Accordingly, Sydney Desalination Plant was assessed to have demonstrated compliance with this obligation.

Discussion and notes

Completion of the laboratory testing is discussed in detail under Element 5 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)). Briefly summarising, the evidence assessed included example records of primary .csv files from Sydney Water Laboratories that are readily accessed via the intranet,[83] and then read into the Veolia water quality dataset. Veolia showed summaries of monitoring from Sydney Water Laboratories, including primary PDF 'certificate of analysis'[84] and 'chain of custody'[85] documents.

Recommendations

There are no recommendations in respect of this obligation.

[83] Workbook: *(2024-05-02)_ZVEOLIA_DS_304140_240501 (1).csv*, Veolia, 02/05/2024.
[84] Document: *(2024-05-02)_ZVEOLIA_DS_COC_240507_M.pdf*, Sydney Water, 07/052024.
[85] Document: *(2024-05-02)_ZVEOLIA_DS_304140_240501 (1).pdf*, Sydney Water, 02/05/2024.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

Table A.4 Water Quality – Network Operator's Licence Sch B cl.8.3

Clause	Requirement	Compliance Grade
Network Operator's Licence Sch B cl.8.3	The Licensee must ensure that analyses of all samples taken for the purposes of Verification Monitoring are carried out by a laboratory accredited for the specified tests by an independent body that is acceptable to NSW Health, such as the National Association of Testing Authorities or an equivalent body.	**Compliant**

Risk	Target for Full Compliance
This requirement reflects a high operational risk. It is essential that testing is undertaken by an accredited laboratory to ensure credibility of results.	Evidence that sample analysis has been undertaken by a laboratory accredited by NATA for the specific testing that has been carried out (or equivalent).

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Site inspection of infrastructure at the Sydney Desalination Plant on 29 November 2024.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 10, August 2024.
- Sydney Desalination Plant, *Infrastructure Operating Plan*, Revision 9, August 2024.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that samples taken for the purposes of Verification Monitoring are analysed in NATA (National Association of Testing Authorities) accredited laboratories, the scope of accreditation for which collectively cover the tests undertaken, as applicable. Reports of analyses undertaken for the purposes of verification monitoring demonstrated that the tests were undertaken in compliance with that NATA accreditation.

Accordingly, Sydney Desalination Plant was assessed to have demonstrated compliance with this obligation.

Discussion and notes

Completion of the laboratory testing is discussed in detail under Element 5 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)). Briefly summarising, the evidence assessed included examples of Sydney Water Laboratories primary PDF 'certificate of analysis'[86] files that included NATA certification credentials. Sydney Water Laboratory Services holds NATA Accreditation No: 63 for compliance with ISO/IEC 17025 – Testing.[87]

On this basis, it is apparent that samples taken for the purposes of verification monitoring are analysed in NATA (National Association of Testing Authorities) accredited laboratories.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[86] Document: *(2024-05-02)_ZVEOLIA_DS_COC_240507_M.pdf*, Sydney Water, 07/052024.
[87] URL: NATA website at https://nata.com.au/accredited-organisation/sydney-water-laboratory-services-63-56/

Appendix B Detailed Audit Findings – Infrastructure

Detailed audit findings in respect of the obligations related to *Infrastructure* are presented in this Appendix.

Table B.1 Infrastructure – WIC Reg Sch 1 cl.6(2)(a)

Clause	Requirement	Compliance Grade
WIC Reg Sched 1 cl.6(2)(a)	The Licensee must ensure that its infrastructure operating plan is fully implemented and kept under regular review and, in particular, that all of its activities are carried out in accordance with the plan.	 **Compliant**

Risk

This requirement reflects a high operational risk. Implementation of the *Infrastructure Operating Plan* ensures the effective (safe and reliable) delivery of agreed levels of service. Regular review ensures that the *Plan* remains current and reflects the current circumstances of the scheme.

Target for Full Compliance

Evidence that the *Infrastructure Operating Plan* is fully implemented, and the Licensee's activities are carried out in accordance with that *Plan*; evidence that the *Plan* is kept under regular review.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Site inspection of infrastructure at the Sydney Desalination Plant on 29 November 2024.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 10, August 2024.
- Sydney Desalination Plant, *Infrastructure Operating Plan*, Revision 9, August 2024.
- Screenshot: *VAMS SWI PMP21340 refurb.PNG*, Veolia, 29/11/2024.
- Document: *VAMS New Asset Details PMP51614-00 (E-KUR90843).pdf*, Veolia, 29/05/2023.
- Document: *VAMS New Asset Details PMP51624-00 (E-KUR90844).pdf*, Veolia, 29/05/2023.
- Document: *VAMS New Asset Details PMP51634-00 (E-KUR90845).pdf*, Veolia, 29/05/2023.
- Email: *Veolia Mail - CRF399 - Upgrade of Fluoride Dosing Pumps - VAMS change required.pdf*, Veolia, 29/05/2023.
- Screenshot: *DWT Roof inspection.PNG,* Veolia, 10/7/2024.
- Screenshot: *Screen grab of Feb 2020 report.PNG*, McLennans Diving Service, 12/2/2020.
- Screenshot: *DWT 5 yearly WO for next inspection.PNG*, Veolia, 29/11/2024.
- Screenshot: Corrective work order- repair rotating vent.PNG, Veolia, 29/11/2024.
- Screenshot: *Screen grab of Feb 2020 report.PNG*, McLennans Diving Service, 12/2/2020.
- Screenshot: *DWT 5 yearly WO for next inspection.PNG*, Veolia, 29/11/2024.
- Screenshot: Corrective work order- repair rotating vent.PNG, Veolia, 29/11/2024.
- Document: *Sydney's Desalination Plant Attachment to O and M Report, Asset Management Report,* Veolia, 30/10/2024.
- Screenshot: *CCP6 Fluoride cal WO.pdf*, Veolia, 07/02/2024.
- Photo: *20241205_141037.jpg*, Veolia, 05/12/2024.
- Photo: *20241205_141042.jpg*, Veolia, 05/12/2024.
- Photo: *20241205_141046.jpg*, Veolia, 05/12/2024.

- Document: *HachCOARequest_021817.pdf*, Hach, 5/7/2022.
- Document: *I_[2024-08-05] Internal Laboratory Results (Published on 2024-08-08 12_33 by ELOISE).pdf*, Veolia, 08/08/2024.
- Document: Extract of training matrix for operator.PNG, Veolia, 08/04/2024.
- Presentation: *MAN - 9768-Kurnell HACCP Awareness.pptx*, Veolia, 08/04/2024.
- Document: *MAN-9768- Kurnell HACCP Awareness_ Operator Competency Assessment.pdf*, Veolia, 08/04/2024.
- Document: *MAN-9768- Kurnell HACCP Awareness_ Operator Competency Assessment - Answers.pdf*, Veolia, 08/04/2024.
- Document: *Completed Assessment HACCP_David Towle.pdf*, Veolia, 14/03/2024.
- Document: *Training Attendance Register 20240314.pdf*, Veolia, 14/03/2024.
- Document: *Minutes SDP-SW Water Supply Review Group Meeting Aug 2024.PDF*, Sydney Water, 07/08/2024.
- Document: *SDP Invoice Information 10 2024(1).PDF*, Sydney Desalination Plant, October 2024.
- Document: *SDP KPI Monthly Performance Report October 2024(1).PDF*, Sydney Desalination Plant, October 2024.
- Document: *2024 WQ Risk Assessment Briefing Paper Rev 1 - Kurnell.pdf*, Veolia, 13/11/2024.
- Document: *(1) Kurnell HACCP and WQ risk assessment workshop 2022.12.02 - Minutes (1).pdf*, Veolia, 02/12/2022.
- Document: *(2) Kurnell HACCP Analysis (Decision Tree Outcomes)- 2022.12.02 (1).pdf*, Veolia, 02/12/2022.
- Document: *Sydney Desalination Plant - RO Train Conductivity and LRV Analysis.pdf*, Veolia, undated.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that, during the audit period, it had fully implemented and carried out its activities in accordance with the arrangements detailed in the *Infrastructure Operating Plan*. This was evident from the operational and maintenance activities that had been implemented; the actions taken to ensure that operators maintained, and contractors possessed appropriate competencies; and the focus on continual improvement.

Sydney Desalination Plant also demonstrated that it has kept the *Infrastructure Operating Plan* under regular review.

Accordingly, Sydney Desalination Plant is assessed to have demonstrated compliance with this obligation.

Discussion and notes

Overview:

The auditor checked for evidence that the *Infrastructure Operating Plan* was being fully implemented and kept under regular review and that all the Network Operator's activities are carried out in accordance with that *Plan*.

Design and Construction:

No new infrastructure was brought into commercial operation during the audit period. Accordingly, no design and/or construction of new infrastructure was undertaken.

Capital investment during the audit period comprised business-as-usual refurbishment/replacement of equipment, i.e. periodic maintenance. Any such capital investment is subject to the preparation and submission of a business case by Veolia (as operator) to Sydney Desalination Plant for approval. Where appropriate, an evaluation of options and their suitability is undertaken to ensure that the most appropriate solution is implemented.

Operation and Maintenance:

Operation and maintenance of the infrastructure is undertaken in accordance with the general principles/strategy outlined in the *Infrastructure Operating Plan*, as well as the *Water Quality Plan*.

More specifically, as reported under Element 4 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)), operation of the Sydney Desalination Plant is undertaken under the umbrella of Veolia's BMS using its operational procedures.

All maintenance activities are managed using Veolia's VAMS computerised maintenance management system (CMMS). The on-ground condition of the infrastructure was assessed during the field audit inspection, which found no evidence of poor condition. The raw water intake did not show signs of significant fouling. The marine grade stainless steel drum screens were clean, in good condition, with seals intact and visibly well-lubricated. Both had been recently partially refurbished, in this (one screen) and the previous (another screen) audit period, including replacing the sacrificial anodes. The 12 media filters within module 1 were inspected. They remained roofed, and showed no evidence of significant fouling. To inform media replacement frequency, the filters were subjected to three-yearly sampling along with review of the run time between backwashes (currently 48 hours) and differential pressure. Inspection and maintenance of the treated water storage which, whilst not a 'CCP', is just as critical as any CCP since preventing contamination at this point is the last point at which it can be controlled.

There has been no major new infrastructure installed, other than swap-outs and similar small changes. During the audit the five raw water pumps were being refurbished,[88] with one of the pumps observed during the field audit as being currently out of service for proactive maintenance.

Examples of asset creation were observed. This included replacement of the fluoride dosing pumps in March and April 2023 with new assets created in VAMS for those.[89,90,91,92] The reports illustrated monitoring and management of those assets. The PMs and refurbishments were triggered by knowledge of asset age (15 years), temperature, vibration analysis, visual inspection, and sound.

The annual general "Drinking Water Tank Roof Inspection" was illustrated as a scheduled and completed task.[93] This was scheduled for the window 13/2/23 to 14/4/23, and completed 9 May 2023. The inspection found some corroded gutter clips and a seized whirlybird, and VAMS recorded the corrective works, e.g. "Repair rotating vent on top of Drinking Water". The job was overdue, but a new system has been put in place to help keep jobs on track.

Five-yearly inspections were illustrated for the treated water storage tank that holds potabilised free chlorinated water pre ammoniation.[94,95] This was completed February 2020, and another one is due shortly. The previous report showed detailed inspection of whirly birds and static ventilators and other common failure sites.

Many outdoor structures, such as roofs, including the treated water storage tank roof, were in good condition, being relatively new, (post the 2017 tornado). Additional 'ad hoc' inspections were illustrated post storms, with an example illustrated for a whirlybird replacement following a storm.[96]

[88] Screenshot: *VAMS SWI PMP21340 refurb.PNG*, Veolia, 29/11/2024.
[89] Document: *VAMS New Asset Details PMP51614-00 (E-KUR90843).pdf*, Veolia, 29/05/2023.
[90] Document: *VAMS New Asset Details PMP51624-00 (E-KUR90844).pdf*, Veolia, 29/05/2023.
[91] Document: *VAMS New Asset Details PMP51634-00 (E-KUR90845).pdf*, Veolia, 29/05/2023.
[92] Email: *Veolia Mail - CRF399 - Upgrade of Fluoride Dosing Pumps - VAMS change required.pdf*, Veolia, 29/05/2023
[93] Screenshot: *DWT Roof inspection.PNG,* Veolia, 10/7/2024.
[94] Screenshot: *Screen grab of Feb 2020 report.PNG*, McLennans Diving Service, 12/2/2020.
[95] Screenshot: *DWT 5 yearly WO for next inspection.PNG*, Veolia, 29/11/2024.
[96] Screenshot: Corrective work order- repair rotating vent.PNG, Veolia, 29/11/2024.

From July 2024, monthly reports have been provided on preventive maintenance activities (PMs) delivered according to asset management key performance indicators (KPIs).[97] Maintenance is reported within its scheduled date plus some grace (20 business days). Penalty points are generated for overdue maintenance. The penalty points add up. The objective is for 80% or more tasks to be on schedule for works in general, and 100% for compliance tasks (e.g. pressure vessel PMs). Progress against this scheduled asset management has been reported monthly.

Based on the above assessment and observations made during the audit site inspection, it was apparent that the infrastructure had been/was being operated and maintained in accordance with the arrangements documented in the *Infrastructure Operating Plan* and good industry practice.

Instrument Calibrations:

The calibration of monitoring instruments is managed using the VAMS maintenance management system and has been discussed under Element 4 in Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)) and a sample of calibration records referenced.

Examples were provided of instrument calibration and reagent currency control, managed using a worksheet system. Third party calibration records were reviewed on site during the audit. The CCP6 fluoridation monitoring instrument was calibrated 23/9/24 at 13:25 (with results entered 26/9/24 into a job record). A record of a more recent fluoridation monitoring instrument calibration was provided as a record.[98] During the field audit the fluoride reagents in the laboratory (0.2, 1 and 2 mg/L solutions) were checked for their currency, and found to be in date, and appropriately stored (being lot A3107 Exp Apr-26;[99] lot A2103 Exp May-27;[100] lot A4106 Exp Apr-29,[101] respectively, along with the relevant certificate of analysis[102]).

Instrument performance and scaling was assessed on the day of the field audit for pre potabilisation: field (10 am) vs. SCADA (10:58 am): turbidity 0.011 vs. 0.01 NTU; pH 5.45 vs. 5.45; and conductivity 24.32 vs. 24 µS/cm, respectively. Scaling was also assessed on the day of the field audit for the final water wet rack: field vs. SCADA: fluoride (10:16 am) 1.01 vs. 1.01 mg/L; free chlorine (10:20 am) 1.78 vs. 1.80 mg/L, respectively. These results were well-aligned, noting that the plant was not running during the inspection.

The daily monitoring data capture log sheet was very detailed, and showed on site laboratory data from both benchtop and ICP monitoring. These were viewed in the field during the audit and another was saved as evidence.[103] The writing was clear in the primary records, which were transcribed into a worksheet, that had conditional formatting to highlight results of interest. The system was effective. As an Observation it was noted that the daily monitoring data capture log sheet had boxes that were too small for comfortable hand-written data entry. Data was being entered at 45° by some operators; or was written horizontally but crammed in. The results were legible, but Veolia was advised of this sub-optimal capture arrangement.

Capability and Training:

As reported under Element 7 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)), Sydney Desalination Plant provided an extensive portfolio of documentation demonstrating that staff had undertaken training. Veolia has a training matrix for each operator that records required competencies and their status.[104] Veolia demonstrated its formal HACCP Training package,[105] that

[97] Document: *Sydney's Desalination Plant Attachment to O and M Report, Asset Management Report,* Veolia, 30/10/2024.
[98] Screenshot: *CCP6 Fluoride cal WO.pdf*, Veolia, 07/02/2024.
[99] Photo: *20241205_141037.jpg*, Veolia, 05/12/2024.
[100] Photo: *20241205_141042.jpg*, Veolia, 05/12/2024.
[101] Photo: *20241205_141046.jpg*, Veolia, 05/12/2024.
[102] Document: *HachCOARequest_021817.pdf*, Hach, 5/7/2022.
[103] Document: *I_[2024-08-05] Internal Laboratory Results (Published on 2024-08-08 12_33 by ELOISE).pdf*, Veolia, 08/08/2024.
[104] Document: Extract of training matrix for operator.PNG, Veolia, 08/04/2024.
[105] Presentation: *MAN - 9768-Kurnell HACCP Awareness.pptx*, Veolia, 08/04/2024.

includes a competency assessment module.[106,107,108] Staff attendance is registered and trainees sign to record their attendance.[109] The competency assessment included (for example): Australian Drivers Licence, High Risk Work Licence, White Card, Confined Space Training, Work Safely at Heights, First Aid, Resuscitation, Certificate III in Water Industry Operations, Fire Warden, and Low Voltage Rescue and Resuscitation. Whilst this training is predominantly health and safety related, it is an essential prerequisite to being able to perform the operation and maintenance activities that enable operation of the desalination plant.

Continual Improvement:

The *Infrastructure Operating Plan*[110] identifies various mechanisms through which it seeks to facilitate continuous improvement. This includes:

- Regular meetings between Sydney Desalination Plant and regulatory agencies, Sydney Water, and Veolia (in its capacity as the system operator).
- Implementation and review of its management systems.
- Reviews/debriefing following incidents and other issues.

Implementation of these arrangements is demonstrated, as reported under Element 10 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)). Sydney Desalination Plant reports on its performance and improvements in its detailed monthly and annual reports to Sydney Water, and its monthly, quarterly and annual meetings.[111,112,113,114] Improvements have been made as part of annual risk assessment reviews,[115,116] and CCP reviews[117,118,119] as noted under Elements 1-3 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)).

Regular Review of Infrastructure Operating Plan:

Sydney Desalination Plant demonstrated that the *Infrastructure Operating Plan* has been kept under regular review. The "Document History" table indicates that it was updated on two occasions, nominally annually, during the audit period: in August 2023 (Revision 8), and August 2024 (Revision 9).

On this basis, it is apparent that the *Infrastructure Operating Plan* has been kept under regular review during the audit period.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[106] Document: *MAN-9768- Kurnell HACCP Awareness_ Operator Competency Assessment.pdf*, Veolia, 08/04/2024.
[107] Document: *MAN-9768- Kurnell HACCP Awareness_ Operator Competency Assessment - Answers.pdf*, Veolia, 08/04/2024.
[108] Document: *Completed Assessment HACCP_David Towle.pdf*, Veolia, 14/03/2024.
[109] Document: *Training Attendance Register 20240314.pdf*, Veolia, 14/03/2024.
[110] *Infrastructure Operating Plan*, section 5.
[111] Document: *Minutes - SDP Operations Oct 24.pdf*, Sydney Water, 31 October 2024.
[112] Document: *Minutes SDP-SW Water Supply Review Group Meeting Aug 2024.PDF*, Sydney Water, 07/08/2024.
[113] Document: *SDP Invoice Information 10 2024(1).PDF*, Sydney Desalination Plant, October 2024.
[114] Document: *SDP KPI Monthly Performance Report October 2024(1).PDF*, Sydney Desalination Plant, October 2024.
[115] Document: *2024 WQ Risk Assessment Briefing Paper Rev 1 - Kurnell.pdf*, Veolia, 13/11/2024.
[116] Workbook: *6-TEM-8928 Kurnell Risk Register_Water Quality 20241125 Update.xlsx*, Veolia, 25/11/2024.
[117] Document: *(1) Kurnell HACCP and WQ risk assessment workshop 2022.12.02 - Minutes (1).pdf*, Veolia, 02/12/2022.
[118] Document: *(2) Kurnell HACCP Analysis (Decision Tree Outcomes)- 2022.12.02 (1).pdf*, Veolia, 02/12/2022.
[119] Document: *Sydney Desalination Plant - RO Train Conductivity and LRV Analysis.pdf*, Veolia, undated.

Table B.2 Production – Network Operator's Licence Sch A cl.1.2

Clause	Requirement	Compliance Grade
Network Operator's Licence Sch A cl.1.2 and 1.3	The Licensee must comply with any Annual Production Request made by the Sydney Water Corporation under the Decision Framework, provided that the request is consistent with the Decision Framework, and; a) the Licensee will not be in breach of this obligation if the Licensee produces in the relevant financial year an amount of water that is between 90% and 110% of the Annual Production Request; b) the Licensee will not be in breach of this obligation if: i. the breach arises from the Licensee endeavouring to comply with any request, other than an Annual Production Request, made by the Sydney Water Corporation under the Decision Framework; and ii. it would not be possible for the Licensee to comply with both the Annual Production Request and the other request. c) despite clause 1.2(a), if Sydney Water Corporation varies an Annual Production Request during a financial year then the Licensee will not be in breach of this obligation for that financial year unless: i. as of the day before the varied Annual Production Request taking effect, had the Licensee produced an amount of water equal to the Capacity of the Water Infrastructure for the plant during every day remaining in the financial year, the Licensee would have produced less than 90% of the amount of water required to be produced by the Annual Production Request before it was varied, or ii. the Licensee produces, during the period between (and including) the day upon which the varied Annual Production Request takes effect and the last day of the financial year, an amount of water which is less than 90%, or more than 110%, of the amount of water required to be produced during that period under the varied Annual Production Request.	 **Compliant**

Risk	Target for Full Compliance
Non-compliance with this requirement presents a significant risk to the effectiveness of the scheme with respect to water supply security and as a backup for water quality management of the Sydney Water drinking water supply system.	Evidence that the Licensee has complied with the Annual Production Request made by the Sydney Water Corporation.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Document: *Annual Production Request 2024-25 Letter DRAFT v2.PDF*, Sydney Water, 01/05/2024.
- Presentation: *APR 6 Month Review 2024 SDP.pptx*, Sydney Water, undated.
- Screenshot: *APR 6-Month Review Screen Grab.png, , Sydney Desalination Plant*, 23/10/2024.
- Worksheet: *APR FY25 (00122003xCE34F) Dec 24 - Veolia Edit.xlsx*, Veolia, 14/06/2024.
- Email: *Update from Amid*, *Veolia Mail - Update from Amid.pdf*, Veolia, 16/8/2024.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that it had complied with the Annual Production Request made by the Sydney Water Corporation. It also demonstrated that it had notified IPART regarding this compliance during the audit period.

Accordingly, Sydney Desalination Plant was assessed to have demonstrated compliance with this obligation.

Discussion and notes

The auditor sought evidence that the Licensee had complied with the Annual Production Request made by the Sydney Water Corporation.

Sydney Desalination Plant demonstrated that it had negotiated its Annual Product Request, and amendments to that during the year, and communicated those to Veolia.[120] This involved Sydney Water requesting production, Sydney Desalination Plant proposing how that can realistically be achieved in liaison with Veolia, and Sydney Water accepting the proposal. Sydney Water provides a detailed presentation of its production requests to help facilitate discussion.[121] These production requests are reviewed six monthly.[122] Sydney Desalination Plant issues a monthly water order based on the request from Sydney Water, and Veolia must find a way to meet that and convert that to hourly production profile. Veolia provided many examples on its intranet of how it receives, responds to, and schedules its response to production requests. Veolia a worksheet that is used to both plan forward production, and to report historically on performance against production targets.[123] In this way, Sydney Water requirements were converted to monthly and daily production plans, and performance was regularly reported and presented.

Veolia demonstrated that an email had been issued to all its staff formalising that the new Operations and Maintenance Contract and Operating Rules were now in place. Veolia staff were also briefed to explain the changes that the new Operations and Maintenance Contract and Operating Rules encompass.[124] This clarified the need to manage the water order tightly. The "RO train scheduling" is very detailed, down to the hour.

Sydney Desalination Plant illustrated how performance was reported monthly as performance to date, and projected performance, for each reporting year. An example was provided of the annual production request in which Veolia compared requested with actual production monthly.

Sydney Desalination Plant illustrated monthly actual vs. forecast production, tracking against the annual production request. To date the performance has been good. Actual performance is flexible to adapt to changing requests and agreements between Sydney Water and Sydney Desalination Plant.

[120] Document: *Annual Production Request 2024-25 Letter DRAFT v2.PDF*, Sydney Water, 01/05/2024.
[121] Presentation: *APR 6 Month Review 2024 SDP.pptx*, Sydney Water, undated.
[122] Screenshot: *APR 6-Month Review Screen Grab.png, , Sydney Desalination Plant*, 23/10/2024.
[123] Worksheet: *APR FY25 (00122003xCE34F) Dec 24 - Veolia Edit.xlsx*, Veolia, 14/06/2024.
[124] Email: *Update from Amid*, *Veolia Mail - Update from Amid.pdf*, Veolia, 16/8/2024.

Examples of annual reports illustrated that performance followed requirements. As part of the annual report, the Sydney Desalination Plant issued summary reports to IPART, which were signed by both Sydney Water and Sydney Desalination Plant.[125] This illustrated performance against both fixed production and emergency response periods.

Based on these observations, it is apparent that Sydney Desalination Plant complied with its requirements in respect of the Annual Production Request made by the Sydney Water Corporation during the audit period.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[125] Document: *SDP FY24 Annual Production Request Summary - IPART Notification - Signed.PDF*, Sydney Desalination Plant, 16/07/2024.

Table B.3 Production – Network Operator's Licence Sch A cl.1.3

Clause	Requirement	Compliance Grade
Network Operator's Licence Sch A cl. 1.3	The Licensee must use its best endeavours to comply with any request, other than an Annual Production Request, made by the Sydney Water Corporation under the Decision Framework, provided that the request is consistent with the Decision Framework.	**Compliant**

Risk	Target for Full Compliance
Non-compliance with this requirement presents a significant risk to the effectiveness of the scheme with respect to water supply security and as a backup for water quality management of the Sydney Water drinking water supply system.	Evidence that the Licensee has used its best endeavours to comply with any request, other than an Annual Production Request, made by the Sydney Water Corporation under the Decision Framework.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Document: *SDP FY24 Annual Production Request Summary - IPART Notification - Signed.PDF*, Sydney Desalination Plant, 16/07/2024.
- Document: *Attachment 1 - Monthly Report - Oct 2024.docx.PDF*, Sydney Desalination Plant, 04/11/2024.
- Document: *Internal memo - April 2024 Ramp Up performance.PDF*, Veolia, 15/05/2024.
- Document: *Internal memo - August 2024 Ramp Up performance v1.PDF*, Veolia, 21/08/2024.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that it had used its best endeavours to comply with any request, other than an Annual Production Request, made by the Sydney Water Corporation under the Decision Framework.

Accordingly, Sydney Desalination Plant was assessed to have demonstrated compliance with this obligation.

Discussion and notes

The auditor sought evidence that the Licensee had used its best endeavours to comply with any request, other than an Annual Production Request, made by the Sydney Water Corporation under the Decision Framework.

Sydney Desalination Plant illustrated performance against both fixed production[126] and emergency response periods,[127] with both objectives having been met during the audit period, including actual[128] and trial[129] ramp up periods.

[126] Document: *SDP FY24 Annual Production Request Summary - IPART Notification - Signed.PDF*, Sydney Desalination Plant, 16/07/2024.
[127] Document: *Attachment 1 - Monthly Report - Oct 2024.docx.PDF*, Sydney Desalination Plant, 04/11/2024.
[128] Document: *Internal memo - April 2024 Ramp Up performance.PDF*, Veolia, 15/05/2024.
[129] Document: *Internal memo - August 2024 Ramp Up performance v1.PDF*, Veolia, 21/08/2024.

Based on these observations, it is apparent that during the audit period, Sydney Desalination Plant complied with its requirements in respect of using its best endeavours to comply with requests, other than an Annual Production Request, made by the Sydney Water Corporation under the Decision Framework.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

Appendix C Detailed Audit Findings – Reporting and Incident Notification

Detailed audit findings in respect of the obligations related to *Reporting and incident notification* are presented in this Appendix.

Table C.1 Reporting and Incident Notification – Network Operator's Licence Sch B cl.6

Clause	Requirement	Compliance Grade
Network Operator's Licence Sch B cl.6.1	The Licensee must prepare and submit reports in accordance with the Reporting Manual.	**Compliant**

Risk	Target for Full Compliance
Non-compliance with this requirement presents no significant risk to the operational safety of the scheme.	Evidence that the Licensee has prepared and submitted the requisite reports to IPART in accordance with the Reporting Manual.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- IPART, Network *Operator's Reporting Manual and Retail Supplier's Reporting Manual under Water Industry Competition Act 2006; Manual* (Revision 13), 1 April 2022.
- Screenshot: *WILMA Screen Grab.png*, Sydney Desalination Plant, 29/11/2024.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that it had prepared and submitted its *Annual Compliance Reports* in accordance with the *Reporting Manual*. It also demonstrated that it had notified IPART regarding changes to details of its insurance coverage during the audit period.

Accordingly, Sydney Desalination Plant was assessed to have demonstrated compliance with this obligation.

Discussion and notes

The auditor sought evidence that the Licensee had prepared and submitted reports in accordance with the *Reporting Manual*.[130] The *Reporting Manual* requires the submission of an *Annual Compliance Report* comprising of an Annual Compliance Report Certification, a Non-Compliance Schedule (Schedule A) and a report in relation to Performance Indicators (Schedule B). An annual declaration in relation to maintaining appropriate insurance, together with copies of certificates of currency (Schedule C) and explanation of any changes to insurance (Schedule D); and a Financial Capacity Statement (Schedule E) are also to be provided. The report is to be submitted to IPART no later than 31 August each year; accordingly, submission of an *Annual Compliance Reports* in respect of the 2022/23 and 2023/24 financial years was required during the audit period.

Reporting is also required in respect of any incidents (using the standard Incident Forms A and B), any self-identified non-compliances, and any "other notifications and information reporting" as detailed in the *Reporting Manual*. In this audit period, no such notifications were required.

Sydney Desalination Plant demonstrated that it had lodged its annual reports on WILMA, along with the required schedules. Likewise, Sydney Desalination Plant demonstrated that it had lodged its insurance changes via WILMA. To demonstrate that it had reported as required during the audit period, Sydney Desalination Plant provided a record of *WILMA Notifications*,[131] which listed all

[130] IPART, *Network Operator's Reporting Manual and Retail Supplier's Reporting Manual under Water Industry Competition Act 2006; Manual* (Revision 13), 1 April 2022.
[131] Screenshot: *WILMA Screen Grab.png*, Sydney Desalination Plant, 29/11/2024.

reporting and notifications submitted via the WILMA portal during the audit period, including annual reports and insurance updates.

Based on these observations, it is apparent that Sydney Desalination Plant complied with its requirements in respect of the preparation and submission of reports, as specified in the *Reporting Manual*, during the audit period.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

Table C.2 Reporting and Incident Notification – WIC Reg Sch 1 cl.1(2)

Clause	Requirement	Compliance Grade
WIC Reg Sch 1 cl.1(2)	The licensee must immediately notify the following persons of an incident in the conduct of the licensee's activities that threatens, or could threaten, water quality, public health or safety: (a) IPART, (b) the Minister administering the *Public Health Act 2010*, (c) the Minister administering the Act, Part 2, (d) a licensed retail supplier supplying water or provides sewerage services by means of the licensee's infrastructure, (e) any other licensed network operator or public water utility whose infrastructure is connected to the licensee's infrastructure. Note: *Audit of paragraph (d) is not required as the same parent company manages both the network and retail operations.*	 **Compliant**

Risk	Target for Full Compliance
This requirement reflects a high operational risk. It is essential that relevant stakeholders are made aware of incidents that threaten, or could threaten, water quality, public health or safety.	In the event that a notifiable incident has occurred, evidence that the Licensee provided the required notifications.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 29 November 2024.
- Site inspection of infrastructure at the Sydney Desalination Plant on 29 November 2024.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 10, August 2024.
- Sydney Desalination Plant, *Infrastructure Operating Plan*, Revision 9, August 2024.
- Document: *SDP-SW Operating Protocol Appendix 1: Contacts and Communications Matrix*, Sydney Desalination Plant, 13/10/2023.
- Document: *Notifications to NSW Health*, *Table 6-1: Primary Contacts*, Sydney Desalination Plant, undated.
- Screenshot: *NSW Health Notification Protocol.png*, Sydney Desalination Plant, 09/01/2024.
- Screenshot: *SWC Notification Protocol.png*, Sydney Desalination Plant, 29/11/2024.
- Document: *Internal memo - April 2024 Ramp Up performance.PDF*, Veolia, 15/05/2024.
- Document: *Internal memo - August 2024 Ramp Up performance v1.PDF*, Veolia, 21/08/2024.
- Document: *Kurnell PIRMP Test 24092024.pdf*, Veolia, 24/09/2024.

Summary of reasons for grade

Sydney Desalination Plant advised that no incidents were required to be reported to IPART during the audit period. Review of a sample of SCADA trend data and test results from ongoing operational and verification monitoring samples revealed no evidence that there had been any reportable incidents during the audit period.

Based on a brief review of relevant documentation (*Incident and Emergency Management Manual* and related procedures), and the demonstrated systems for the notification of reportable incidents, it is apparent that Sydney Desalination Plant has appropriate incident notification arrangements in place.

Accordingly, Sydney Desalination Plant was assessed to have demonstrated compliance with this obligation.

Discussion and notes

Overview:

The auditor questioned whether there had been any incidents arising from the conduct of the network operator's activities during the audit period that threatened, or could have threatened, water quality, public health or safety and, if so, whether IPART, the Minister administering the *Public Health Act 2010 (NSW)*, the Minister administering Part 2 of the *Water Industry Competition Act 2006 (NSW)* and any connected network operator, retail supplier or public water utility had been notified as required. Sydney Desalination Plant advised that there had been no reportable incidents during the audit period.

A review of water quality monitoring data was also undertaken to confirm that there had been no reportable incidents, i.e. incidents that threatened, or could have threatened water quality, public health or safety.

Incident Notification Arrangements:

Incident monitoring and management was described under the *Water Quality Plan* and is discussed in detail under Element 6 of Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)). Briefly summarising, Sydney Desalination Plant maintains a register of emergency contact details, including Sydney Water[132] and NSW Health.[133] Explicit notification protocols have been developed for NSW Health[134] and Sydney Water[135] that define a number of conditions under which notification is required. This demonstrates that Sydney Desalination Plant has maintained current contact details for incident-related contact points during the audit period.

Sydney Desalination Plant and Veolia illustrated their incident and emergency response system, including running mock exercises. This includes examples of typical triggers and process flow diagrams to guide responses and notification requirements relating to most reasonably foreseeable incidents. The principal parties to be notified are IPART, NSW Health and Sydney Water. If required, public notification is via Sydney Water. An example of a ramp up non-notifiable incident during April 2024 was provided, with a detailed report post the event illustrating the lessons learnt and preparedness for future incidents.[136] As part of readiness response, readiness and ramp up tests were also conducted in the period 1-15 August 2024, involving Sydney Desalination Plant and Sydney Water.[137] An example of a mock evacuation drill exercise was summarised from July 2024.[138]

Based on these observations, and the demonstrated notification of incidents as detailed above, it is apparent that Sydney Desalination Plant has appropriate incident notification arrangements in place.

[132] Document: *SDP-SW Operating Protocol Appendix 1: Contacts and Communications Matrix*, Sydney Desalination Plant, 13/10/2023.
[133] Document: *Notifications to NSW Health*, *Table 6-1: Primary Contacts*, Sydney Desalination Plant, undated.
[134] Screenshot: *NSW Health Notification Protocol.png*, Sydney Desalination Plant, 09/01/2024.
[135] Screenshot: *SWC Notification Protocol.png*, Sydney Desalination Plant, 29/11/2024.
[136] Document: *Internal memo - April 2024 Ramp Up performance.PDF*, Veolia, 15/05/2024.
[137] Document: *Internal memo - August 2024 Ramp Up performance v1.PDF*, Veolia, 21/08/2024.
[138] Document: *Kurnell PIRMP Test 24092024.pdf*, Veolia, 24/09/2024.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

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