Cobbitty Consulting
Engineering and Advisory Services

Water Futures

Sydney Desalination Plant

2022 Operational Audit

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Independent Pricing and Regulatory Tribunal

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Document History

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Independent Pricing and Regulatory Tribunal

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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 Deed; 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 has been "… *in a state of availability to assist Sydney Water in providing high quality drinking water to customers in Greater Sydney*" since February 2020. In practice, it has produced and supplied water each month under a series of 'Emergency Response Notices' issued by Sydney Water (its sole customer), primarily to mitigate public health incident at minimum cost.

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 as a result of this audit.

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

[1] IPART, *Audit Guideline; under the Water Industry Competition Act 2006*, July 2020.

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 4, July 2019;
  - Revision 5, 25 July 2020;
  - Revision 6, 5 July 2021; and
  - Revision 7, 9 August 2022; and
- Water Quality Plan:
  Sydney Desalination Plant, *Water Quality Plan*, including:
  - Revision 5, July 2019;
  - Revision 6, 25 July 2020;
  - Revision 7, 5 July 2021; and
  - Revision 8, 9 August 2022.

From an operational perspective, the Sydney Desalination Plant has been "… in a state of availability to assist Sydney Water in providing high quality drinking water to customers in Greater Sydney" since February 2020.[2] In practice it has produced and supplied water each month under a series of 'Emergency Response Notices' issued by Sydney Water (its sole customer), primarily to mitigate public health incident at minimum cost.

It is noted that Sydney Desalination Plant has entered into three long-term contracts with Veolia Water Australia (VWA of Veolia) for the operation and maintenance of the desalination plant, drinking water pumping station, and the Kurnell to Erskineville pipeline.[3] 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*.[4] The specific scope of the audit was as defined in IPART's letter to Sydney Desalination Plant (reference D22/20995) dated 10 October 2022; 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 1 July 2020 to 18 September 2022.

It is noted that:

- The 2021 version of the *Regulation* came into effect on 1 September 2021, i.e. during the audit period; the previous 2008 version was in place prior to that date. Wording from the 2021 version has been adopted for the purposes of this report; however, it is noted that the updated version did not give effect to any material changes to the regulatory requirements.
- The version of the *Licence* in place during the audit period was that approved on 3 November 2017. A new (updated) version was approved on 19 September 2022 (i.e. the day following the end of the audit period). The updated version reflects changes to the operating rules under the recently released *Greater Sydney Water Strategy*;[5] however, these changes do not take effect until IPART's 2017 pricing determination[6] is replaced or IPART advises otherwise in writing.

[2] Sydney Desalination Plant website at: https://sydneydesal.com.au/how-we-do-it/operations/operational-information/.
[3] *Infrastructure Operating Plan*, section 1.2.2 and *Water Quality Plan*, section 1.2.2.
[4] IPART, *Audit Guideline; under the Water Industry Competition Act 2006*, July 2020.
[5] NSW Department of Planning and Environment, *Greater Sydney Water Strategy; Water for a thriving, sustainable and resilient Sydney*, August 2022.
[6] IPART, *Prices for Sydney Desalination Plant Pty Ltd's Water Supply Services; 1 July 2017 to 30 June 2022*, June 2017.

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, an *Information Request* was sent to both the Licensee and IPART approximately four weeks prior to the audit fieldwork being undertaken. The Licensee provided an information pack in response to the request, which was reviewed by the auditor prior to 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 25 January 2023. 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 Jim Sly and a peer/quality assurance review was undertaken by Dr Dan Deere. 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 – Operation and Maintenance Manager; and
- Veolia team:
  - Amid Akhyani – Operations Manager;
  - Linda Nappa – Process Manager;
  - Garrick Lai – Process Engineer; and
  - Fredrich Ramirez – Asset Engineer.

IPART representatives Sachin Singh attended as an observer during the audit fieldwork.

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)*;[7]
- IPART, *Audit Guideline; under the Water Industry Competition Act 2006*, July 2020;
- *Australian Drinking Water Guidelines 2011(as amended August 2018)*;
- *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**.

[7] As noted in section 2.3.1, the 2021 version of the *Regulation* came into effect from 1 September 2021 and was applicable for the remainder of the audit period; the 2008 version was in place for the portion of the audit period prior to that date.

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.

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

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* (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.

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*.

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.

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 25 January 2023.
- Site inspection of infrastructure at the Sydney Desalination Plant on 25 January 2023.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 8, 9 August 2022.
- Department of Planning and Environment, *Greater Sydney Water Strategy; Water for a thriving, sustainable and resilient Sydney*, August 2022.
- Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.
- Document: *26 November 2021 - SDP NSW Health Qtr Minutes.pdf.*
- Document: *25 August 2022 - SDP NSW Health Qtr Minutes.pdf.*
- Document: *Minutes - SDP operations Sept 21.pdf.*
- Document: *minutes- SDP operations 24 Aug 22.pdf.*
- Document: *20211126 - SDP Ausgrid Qtr Meeting Minutes.pdf.*
- Document: *20220825 - SDP Ausgrid Qtr Meeting Minutes.pdf.*
- Letter dated 4 December 2020 from Sydney Water to Sydney Desalination Plant (file: *Sydney Water request KWSA143 temporary change to chlorine setpoint.pdf*).
- Letter dated 10 December 2020 from Sydney Desalination Plant to Veolia (re: *Downstream Changes – Total Chlorine*) (file: *10 December 2020 SDP notice to Veolia to change setpoint.pdf*).
- Emails dated 16 December 2020 between Sydney Desalination Plant and NSW Health (re: *SWC request for temporary change to SDP chlorine setpoint*).
- Letter dated 17 December 2020 from Veolia to Sydney Desalination Plant (re: *Downstream Changes – Total Chlorine*) (file: *Veolia response to SDP notice to change setpoint.pdf*).
- Letter dated 18 January 2021 from Sydney Water to Sydney Desalination Plant (file: *Sydney Water request KWSA146 continuation of temporary change to chlorine setpoint.pdf*).
- Veolia, *Total Chlorine Increase*, 5 February 2021 (file: *Veolia performance summary of chlorine setpoint change.pdf*).

- MS Excel workbook: *CCP and key water parameter graphs.xlsx.*
- MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx.*
- MS Excel workbook: *Consolidated records of test results across the audit period.xlsx.*
- MS Excel workbook: *3 - TEM-8928-3 Kurnell Risk Register - Water Quality (3).xlsx.*
- Veolia, *Water Quality Risk Assessment Briefing Paper; Sydney Desalination Plant* (Revision 02), 31 October 2022.
- MS Excel workbook: *6 - TEM-8930-HACCP Register.xlsx.*
- Document: *CCP screenshots consolidated.pdf.*
- Veolia, *Drinking Water Quality Management Procedure for Sydney's Desalination Project* (PRO-9904-1), 15 February 2019.
- Veolia, *Intake and Screening Procedure for Desalination Project* (PRO-9902-2), 6 July 2020.
- Veolia, *RO First & Second Pass Systems Procedure for Sydney's Desalination Project* (PRO-9903-2), 18 September 2020.
- Veolia, *RO CIP, Preservation and Neutralisation* (PRO-9698-1), 16 January 2019.
- Veolia, *Critical Control Point Response Procedures* (PRO-9494-4), 11 November 2019.
- Document: *20220407_Kurnell Early Warning and Incident Report EW2022000010_DWPD Total Coliforms.pdf.*
- Document: *2100P 09020C035058.docx.*
- Document: *CDC401 112512583011.docx.*
- Document: *PHC281 200493044917.docx.*
- MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx.*
- Document: *Attachment 1_Monthly Report Sept 2021.pdf.*
- Document: *Attachment 1_Monthly O&M Report - August 2022.pdf.*
- Veolia, *Kurnell Emergency Contact List* (12-TEM-9764-9), dated 6 December 2022.
- Veolia, *Incident and Emergency Management Manual for Sydney Desalination Plant* (MAN-9673-5), undated.
- Document: *5 - PRO-9751-Kurnell Water Quality Incident – Physical_Chemical (1).pdf.*
- Document: *4 - PRO-9494-Kurnell Critical Control Point Response Procedures.pdf.*
- Document: *20220407_Kurnell Early Warning and Incident Report EW2022000010_DWPD Total Coliforms.pdf.*
- Document: *20220531 Kurnell Early Warning and incident Report EW202200020 - DWPW (SP3).pdf.*
- Document: *Incident_Emergency_Crisis Debrief Report Oct 2020.docx.*
- Document: *20210811 Kurnell SDP - Rivo 5523355 Incident_Emergency_Crisis Debrief Report (2).docx.*
- Document: *Incident_Emergency_Crisis Debrief Report June 2022.docx.*
- Document: *Training Request - Confined Space 11.5.21 – 1.docx.*
- Document: *Copy of Purchase Order – 7300130345.pdf.*
- Document: *Confined Space Refresher April 27 and 11 May (2).pdf.*
- Document: *Pre-Attendance List Confined Space 27 April Veolia_.docx.*

- PowerPoint presentation: *Lab Training 2019 Presentation.pptx*.
- Certificate of Completion: *aal-e-ali Introduction to Spill Management 2021 Workplace Chemistry.pdf*.
- Sydney Desalination Plant website at: https://sydneydesal.com.au/.
- Document: *Cover Letter - Monthly Report - August 2022.pdf*.
- Document: *Attachment 1_Monthly O&M Report - August 2022.pdf*.
- MS Excel workbook: *Attachment 2_August 2022 Safety Report Final (13 Sept).xlsx*.
- Document: *Attachment 3_August 2022 Asset Management Report.pdf*.
- MS Excel workbook: *Attachment 4_Veolia Safety Dashboard August 2022.xlsx*.
- MS Excel workbook: *Appendix C_SDP Monthly Capital Projects Status Report August 2022.xlsx*.
- MS Excel workbook: *Appendix D - Residuals and Waste Disposal and Greenhouse Gas Emissions Data.xlsx*.
- MS Excel workbook: *Appendix E_SDP Internal Audit Action Tracking August 2022.xlsx*.
- Document: *202109 September SDP Monthly Operations Dashboard (00089491xCE34F).pdf*.
- Document: *202208 August 2022 SDP Monthly Operations Dashboard (00100597xCE34F).pdf*.
- *Annual Compliance Report* submitted by Sydney Desalination Plant for 2021/22 reporting period (template format), dated 26 August 2022.
- Document: *6416 - SDP Tech Audit 1 - WH S - Report - Rev 1 - Issued (00090573xCE34F).pdf*.
- Document: *6416 - SDP Tech Audit 2 - Environmental - Report - Rev 2_Issued - Final (00097363xCE34F).pdf*.
- Operations Review Group (ORG) Meeting Minutes for meeting held in August, September and November 2020; April, May, September and October 2021; and January, March and April 2022.
- Document: *SDP_Water Quality Plan 2022 Final w track changes (00098998xCE34F).pdf*.

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 of 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*. It is noted that some discussion in respect of water quality monitoring (sampling and testing) is presented in Table A.2, Table A.2 and Table A.4, and water quality performance is discussed in Table C.2.

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 17 November 2022. A copy of the *Water Quality Policy* is displayed on the site office noticeboard.

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:

There was no change to the Network Operator's Licence, or other regulatory instruments, during the audit period. However, as reported in **Section 2.3.1**, an updated Licence issued the day after the audit period reflects changes to the operating rules; these changes were required to reflect recent actual practice being implemented under Emergency Response Notices (requested by Sydney Water) and to address the more flexible operating requirements of the recently released *Greater Sydney Water Strategy*.[8,9]

Changes arising from the Licence changes will be 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*).[10] This will ensure that the full impact of the change is fully addressed.

Engaging stakeholders:

Sydney Desalination Plant engages regularly with a variety of stakeholders including (for example):

- NSW Health – Sydney Desalination Plant has protocols in place and meets regularly with representatives of NSW Health. Minutes of quarterly meetings held on 26 November 2021[11] and 25 August 2022[12] reveal that matters discussed include (for example) operational updates by both parties (as applicable), water quality performance (a *Critical Control Points Report* is provided in each case) and other items such as regulatory submissions, new operating rules, water quality risk assessments. Actions arising are documented and status monitored.
- Sydney Water – Sydney Desalination Plant has protocols in place and meets regularly with representatives of Sydney Water. Minutes of monthly meetings held on 22 September 2021[13] and 24 August 2022[14] reveal that matters discussed include (for example) safety and environment, plant performance (production and water quality), system performance (water quality and flow schedule), maintenance, communications, and general business.
- Ausgrid – whilst there is no contractual arrangement with Ausgrid, Sydney Desalination Plant liaises regularly in respect of the security of its power supply (impact of shutdowns, etc.). Minutes of meetings held on 26November 2021[15] and 25 August 2022[16] reveal that matters discussed include operational updates from both parties, maintenance activities/planned shutdowns, and projects (e.g. power factor correction and breaker replacement).

[8] Department of Planning and Environment, *Greater Sydney Water Strategy; Water for a thriving, sustainable and resilient Sydney*, August 2022.
[9] These changes will not take effect until IPART's 2017 pricing determination is replaced or IPART advises otherwise.
[10] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022, section 17.
[11] Document: *26 November 2021 - SDP NSW Health Qtr Minutes.pdf.*
[12] Document: *25 August 2022 - SDP NSW Health Qtr Minutes.pdf.*
[13] Document: *Minutes - SDP operations Sept 21.pdf.*
[14] Document: *minutes- SDP operations 24 Aug 22.pdf.*
[15] Document: *20211126 - SDP Ausgrid Qtr Meeting Minutes.pdf.*
[16] Document: *20220825 - SDP Ausgrid Qtr Meeting Minutes.pdf.*

- Department of Planning and Environment – Sydney Desalination Plant has engaged in development of the *Greater Sydney Water Strategy*.
- Department of Home Affairs – liaison is maintained in relation to critical infrastructure/cyber security.
- IPART – as reported in more detail in Table C.1 (in respect of Network Operator's Licence Sch B cl.6.1), Sydney Desalination Plant engaged with IPART, including through the submission of required reporting

This demonstrates that Sydney Desalination Plant continued to engage with relevant stakeholders during the audit period.

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. Sydney Desalination Plant did, however, advise that it had changed the chlorine level in the water supplied to Sydney Water at Sydney Water's request. This change was implemented as follows:

- 4 December 2020 – Sydney Water requested an increase in total chlorine at the Delivery Point (Shaft 11) for a period of 28 days.[17]
- 10 December 2020 – Sydney Desalination Plant notified Veolia (plant operator) of the required change.[18]
- 16 December 2020 – Sydney Desalination Plant advised NSW Health of Sydney Water's request and its intent to implement the change. This was advice was acknowledged by NSW Health by return correspondence.[19]
- 17 December 2020 – Veolia acknowledged the request.[20]
- 18 January 2021 – Sydney Water requested that the temporary change be extended to the end of March 2021.[21]
- 5 February 2021 – Veolia provided a report on the implementation of the change.[22]

Notwithstanding this temporary change in final water specification, it is assessed that the system analysis, as documented in the management plans, remained current during the audit period.

Assessment of water quality data:

Sydney Desalination Plant undertakes regular testing of source water (seawater) quality as part of its monitoring program, which is discussed in more detail in Table A.2 (in respect of Network Operator's Licence Sch B cl.8.1). Monitoring includes online (via SCADA) monitoring of (for example) turbidity[23] and an extensive program laboratory testing comprising daily, weekly, fortnightly, monthly, quarterly and annual analyte groups.[24,25]

[17] Letter dated 4 December 2020 from Sydney Water to Sydney Desalination Plant (file: *Sydney Water request KWSA143 temporary change to chlorine setpoint.pdf*).
[18] Letter dated 10 December 2020 from Sydney Desalination Plant to Veolia (re: *Downstream Changes – Total Chlorine*) (file: *10 December 2020 SDP notice to Veolia to change setpoint.pdf*).
[19] Emails dated 16 December 2020 between Sydney Desalination Plant and NSW Health (re: *SWC request for temporary change to SDP chlorine setpoint*).
[20] Letter dated 17 December 2020 from Veolia to Sydney Desalination Plant (re: *Downstream Changes – Total Chlorine*) (file: *Veolia response to SDP notice to change setpoint.pdf*).
[21] Letter dated 18 January 2021 from Sydney Water to Sydney Desalination Plant (file: *Sydney Water request KWSA146 continuation of temporary change to chlorine setpoint.pdf*).
[22] Veolia, *Total Chlorine Increase*, 5 February 2021 (file: *Veolia performance summary of chlorine setpoint change.pdf*).
[23] MS Excel workbook: *CCP and key water parameter graphs.xlsx*.
[24] MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx*.
[25] MS Excel workbook: *Consolidated records of test results across the audit period.xlsx*.

Hazard identification and risk assessment:

Sydney Desalination Plant provided the most recent *Risk Assessment/Risk Register*,[26] which is presented in a standard Veolia template. It also outlined the review process that had been undertaken during (and subsequent to) the audit period, as follows:

- *18/05/2020 - Annual review of document was completed on 26/10/2019, with no comments or editions made to the register.*
- *24/08/2021 - Part 2 review with SDP, NSW Health and Sydney Water.*
- *09/11/2021 - Final 2021 review file added as version 3 upon completion of the part 2 review.*
- *11/08/2022 - rev 4 - Updating risk register as per actions identified in previous audit (RIVO reference numbers added).*
- *2/12/2022 - Annual risk review conducted as part of HACCP review process.*"

Sydney Desalination Plant also provided a *Risk Assessment Briefing Paper*[27] for the second water quality risk assessment to be held by Sydney Desalination Plant/Veolia in conjunction with Sydney Water and NSW Health; reference is made to the previous review with all parties, conducted on 24 August 2021 (see above). Whilst this *Briefing Paper* was issued after the audit period, it 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 bene reviewed and updated during the audit period.

Element 3 – Preventive measures for drinking water quality management:

Preventative measures and multiple barriers:

There have been no changes to the preventive measures/barriers implemented in respect of the production of drinking water during the audit period.

Water quality monitoring (refer discussion below and in Table A.2), review of performance (refer discussion below and in Table C.2), and the implementation of infrastructure operation and maintenance procedures (refer Table B.1) ensure that barriers are effective in maintaining water quality.

Critical control points:

Critical control points (CCPs) are identified and documented in the *Water Quality Plan*[28]
Sydney Desalination Plant operates with eight (8) CCPs, including:

Critical Control Point	Parameters Monitored
CCP1 Outlet of 1st Pass Reverse Osmosis (Rear Permeate)	Rear permeate conductivity (online)
CCP1a Outlet of 1st Pass Reverse Osmosis (Front Permeate)	Front permeate conductivity (online)
CCP2 Outlet of 2nd pass Reverse Osmosis	Combined 2nd pass permeate conductivity (online)
CCP3 Outlet of Combined Reverse Osmosis	Combined permeate boron concentration (grab)
CCP4 Downstream of Re-mineralisation Loop	Combined remineralisation pH (online) Combined remineralisation turbidity (online) Combined remineralisation fluoride concentration (online)
CCP5 Drinking Water Tank Outlet	Drinking water (pre ammonia) free chlorine concentration (online)
CCP6 Delivery Point at Pump Station	Drinking water total chlorine/monochloramine concentration (online) Drinking water conductivity (online) Drinking water fluoride concentration (online) Drinking water pH (online) Drinking Water turbidity (online)

CCP7 Delivery Point at the last valve before Shaft 11	Drinking water total chlorine concentration (online) High drinking water conductivity (online) Drinking water pH (online) High drinking Water turbidity (online) Other ADWG parameters including metals, pesticides, DBPs and radionuclides (grab)

Warning and critical limits for CCP parameters that are monitored online via the SCADA system are documented in the *HACCP Register*.[29] A review of settings in the SCADA system (captured on a series of screenshots)[30] 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. Monitoring of performance against these parameters is discussed below and in Table C.2 (in respect of WIC Reg Sch 1 cl.1(2)).

Element 4 – Operational procedures and process control:

Operational procedures:

Operation of the Sydney Desalination Plant is undertaken under the umbrella of Veolia's IBMS.[31] An extensive range of standard operating procedures, including (for example) the following, detail specific aspects of scheme operation:

- PRO-9904-1 *Drinking Water Quality Management Procedure for Sydney's Desalination Project.*[32]
- PRO-9902-2 *Intake and Screening Procedure for Desalination Project.*[33]
- PRO-9903-2 *RO First & Second Pass Systems Procedure for Sydney's Desalination Project.*[34]
- PRO-9698-1 *RO CIP, Preservation and Neutralisation Procedure.*[35]

In each case, these procedures provide extensive background and procedural guidance in respect of the processes they address.

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:

As discussed in detail in Table A.2 (in respect of Network Operator's Licence Sch B cl.8.1), 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,

[26] MS Excel workbook: *3 - TEM-8928-3 Kurnell Risk Register - Water Quality (3).xlsx.*
[27] Veolia, *Water Quality Risk Assessment Briefing Paper; Sydney Desalination Plant* (Revision 02), 31 October 2022.
[28] *Drinking Water Quality Management Plan*, section 2.3.2
[29] MS Excel workbook: *6 - TEM-8930-HACCP Register.xlsx.*
[30] Document: *CCP screenshots consolidated.pdf.*
[31] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.
[32] Veolia, *Drinking Water Quality Management Procedure for Sydney's Desalination Project* (PRO-9904-1), 15 February 2019.
[33] Veolia, *Intake and Screening Procedure for Desalination Project* (PRO-9902-2), 6 July 2020.
[34] Veolia, *RO First & Second Pass Systems Procedure for Sydney's Desalination Project* (PRO-9903-2), 18 September 2020.
[35] Veolia, *RO CIP, Preservation and Neutralisation* (PRO-9698-1), 16 January 2019.

monochloramine, alkalinity and fluoride) and those displayed in the SCADA system confirmed that values were consistent.

A review of operational performance as indicated by the monitoring of CCP parameters is presented in Table C.1.

Corrective action:

Corrective actions in respect of (for example) CCP exceedances of warning or critical limits are identified in the *Water Quality Plan*[36] and *HACCP Register*, with more detail in the *Critical Control Point Response Procedures*.[37]

Implementation of corrective actions is demonstrated by the response to CCP parameter exceedances in November 2020 (Boron exceedance) and March 2021 (Turbidity exceedance), which are discussed in detail in Table C.2. *Early Warning and Incident Reports* in respect of (for example) a Total coliforms warning level exceedance at the Drinking Water Pumping Station Discharge on 7 April 2022[38] further demonstrate the implementation of an appropriate investigation/assessment (i.e. corrective action).

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 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. Sydney Desalination Plant provided records of calibration of instruments including (for example):

- Turbidity meter (Serial No: 09020C035058) undertaken by Premier Calibrations on 19 February 2021.[39]
- Conductivity meter and cell (Serial Nos: 110900060643/112512583011) undertaken by Premier Calibrations on 18 February 2021.[40]
- pH meter and electrode (Serial Nos: 091100036626/200493044917) undertaken by Premier Calibrations on 18 February 2021.[41]

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.

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.

The expiry dates for a sample of laboratory reference standards (details not recorded) were checked; they had not been exceeded.

[36] *Water Quality Plan*, appendix B/2.
[37] Veolia, *Critical Control Point Response Procedures* (PRO-9494-4), 11 November 2019.
[38] Document: *20220407_Kurnell Early Warning and Incident Report EW2022000010_DWPD Total Coliforms.pdf.*
[39] Document: *2100P 09020C035058.docx.*
[40] Document: *CDC401 112512583011.docx.*
[41] Document: *PHC281 200493044917.docx.*

Element 5 – Verification of drinking water quality:

Drinking water quality monitoring:

As discussed in detail 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 detailed in the *Internal and External Testing Schedule*.[42]

Verification monitoring involves laboratory testing of grab samples against a series of parameters; these appear to have all been implemented during the audit period. A review of the test results, i.e. performance against targets, is documented in Table C.1 (in respect of WIC Reg Sch 1 cl.1(2)).

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.

Sydney Desalination Plant maintains regular liaison with Sydney Water through mechanisms including monthly meetings, discussion in respect of which is presented above (in respect of Element 1). It is noted that, although consumer satisfaction is not specifically addressed, the matters discussed (water quality; system performance and flow) ultimately impact consumer satisfaction.

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.

A short-term evaluation of results is also presented in the monthly reports (for example the September 2021[43] and August 2022[44] reports) provided by Veolia to Sydney Desalination Plant. 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 is demonstrated by the response to a CCP parameter exceedance in November 2020 (Boron exceedance), which was initially identified by external laboratory testing. The response is discussed in detail in Table C.2.

Element 6 – Management of incidents and emergencies:

Communication:

Further discussion in respect of the management of incidents and emergencies is provided below; however, in respect of communication, the *Incident and Emergency Management Manual* refers specifically to the *Kurnell External Incident Notification Process (PRO-9765)* and *SDP/Veolia Water Quality and Volume Notification Protocol (EXT-9656)* in respect of notification and escalation. Although these were not sighted for the purposes of this audit, the action taken in respect of two notifiable incidents during the audit period (refer Table C.2) demonstrates that appropriate communication arrangements were implemented.

The current *Emergency Contact List*[45] (dated 6 December 2022) was viewed online during the audit interviews. The list is reviewed on a six-monthly (biannually); changes are highlighted in red.

[42] MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx*.
[43] Document: *Attachment 1_Monthly Report Sept 2021.pdf*.
[44] Document: *Attachment 1_Monthly O&M Report - August 2022.pdf*.
[45] Veolia, *Kurnell Emergency Contact List* (12-TEM-9764-9), dated 6 December 2022.

Incident and emergency response protocols:

The *Water Quality Plan*[46] references a number of documents in respect of incident management, including notification requirements. The Veolia IBMS[47] provides more detailed guidance in respect of incident management, also including details in respect of incident reporting/notification.

Principal amongst the referenced documents is the *Incident and Emergency Management Manual*,[48] which in turn references a suite of incident management and response procedures. A sample of these procedures, including the *Water Quality Incident – Physical/Chemical Procedure*[49] and *Critical Control Point Response Procedures*,[50] were provided for review; these procedures are presented as detailed flow charts which set out each response action.

Implementation of incident and emergency response protocols is demonstrated by the action taken in respect of two notifiable incidents (critical limit exceedances) during the audit period; these are reported in detail in Table C.2.

Sydney Desalination Plant also implements its incident response protocols in response to warning setpoint exceedances by *Early Warning and Incident Reports* in respect of (for example):

- a Total coliforms warning level exceedance at the Drinking Water Pumping Station Discharge on 7 April 2022;[51] and
- a Total chlorine warning setpoint exceedance at the Drinking Water Pumping Station Discharge on 31 May 2022.[52]

Sydney Desalination Plant also provided a number of *Crisis/Incident/Emergency/Scenario Debrief Reports* in respect of both actual and training scenario incidents, including the following:

- Ferric sludge spill (actual incident) that occurred on 12 October 2020.[53]
- Ammonia spill between gate and weighbridge (training scenario) undertaken on 11 August 2021.[54]
- Ferric sludge spill (training scenario) undertaken on 20 June 2022.[55]

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:

The *Water Quality Plan*[56] that employee awareness is maintained through induction training. training packages on key topics, manuals and meetings (daily induction meetings and monthly team meetings (although evidence of this was not sought for the purposes of this audit). Procedures and other guidance documentation is made available through Veolia's IBMS,[57] which provides overall guidance for all aspects of operation and maintenance and reference to specific procedural documentation.

[46] *Water Quality Plan*, appendix A/1 (element 6).
[47] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022, sections 7 & 8.
[48] Veolia, *Incident and Emergency Management Manual for Sydney Desalination Plant* (MAN-9673-5), undated.
[49] Document: *5 - PRO-9751-Kurnell Water Quality Incident – Physical_Chemical (1).pdf.*
[50] Document: *4 - PRO-9494-Kurnell Critical Control Point Response Procedures.pdf.*
[51] Document: *20220407_Kurnell Early Warning and Incident Report EW2022000010_DWPD Total Coliforms.pdf.*
[52] Document: *20220531 Kurnell Early Warning and incident Report EW202200020 - DWPW (SP3).pdf.*
[53] Document: *Incident_Emergency_Crisis Debrief Report Oct 2020.docx.*
[54] Document: *20210811 Kurnell SDP - Rivo 5523355 Incident_Emergency_Crisis Debrief Report (2).docx.*
[55] Document: *Incident_Emergency_Crisis Debrief Report June 2022.docx.*
[56] *Water Quality Plan*, appendix A/1 (Element 7).
[57] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.

Employee training:

Sydney Desalination Plant provided an extensive portfolio of documentation demonstrating that staff had undertaken training in respect of (for example): confined space entry; self-contained breathing apparatus; laboratory work; low voltage rescue (excluding and including CPR); and chemical spill management.

Evidence provided included (for example):

- *Training request*,[58] *Purchase order*[59] and *Onsite training booking form*[60] for confined space refresher training undertaken on 27 April 2021 and 11 May2021; *Attendance list* for 27 April 2021 session.[61]
- Training module *2019 Kurnell Laboratory Refresher Training.*[62]
- *Certificates of Completion* for Introduction to Spill Management training conducted during 2021 and 2022.[63]

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

Element 8 – Community involvement and awareness:

Community consultation:

Engagement with stakeholders is discussed above (in respect of Element 1). Sydney Desalination Plant advised that broader community engagement/consultation is undertaken informally. For example, tours of the treatment plant are provided for local schools, Rotary clubs, universities, etc.

The Sydney Desalination Plant website,[64] which can be accessed by members of the community, provides information about the plant and its operation.

Communication:

As previously noted, Sydney Desalination Plant has only one customer, i.e. Sydney Water. As indicated in the *Water Quality Plan*,[65] Sydney Desalination Plant consults with Sydney Water on a variety of issues, including water quality, in accordance with the Operating Protocol. As reported in respect of Element 1, Sydney Desalination Plant has protocols in place and meets regularly with representatives of Sydney Water. Minutes of monthly meetings held on 22 September 2021[66] and 24 August 2022[67] reveal that matters discussed include (for example) safety and environment, plant performance (production and water quality), system performance (water quality and flow schedule), maintenance, communications, and general business.

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.

Validation of processes:

Validation of processes was achieved through pilot plant testing prior to construction of the treatment plant. 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:

As indicated in the *Water Quality Plan*,[68] records are managed in accordance with Veolia's IBMS, and more specifically the *Document Management Procedure* and *Records Management Procedure* (not sighted for the purposes of this audit). The extensive portfolio of documentation provided as evidence for this audit demonstrates the effective implementation of such procedures.

Reporting:

Reporting was undertaken at various levels during the audit period, including (for example):

- Veolia provides monthly reports to Sydney Desalination Plant (for example the September 2021 and August 2022 reports), which comprise (for August 2022):
  - Covering letter;[69]
  - Monthly report (Operations and Maintenance), which addresses: safety, operations, process, asset management, the pipeline, defected and projects, with further detail (appendices) environmental matters, water quality performance, and change orders, defects and capital projects;[70]
  - Safety report;[71]
  - Asset management report;[72]
  - Safety dashboard;[73]
  - Capital projects status report;[74]
  - Chemical Consumption, Residuals, Waste Disposal and Greenhouse Gas Emissions Data;[75] and
  - Internal Audit Action Tracking.[76]
- Sydney Desalination Plant provides monthly dashboard reports to its Board (for example the September 2021[77] and August 2022[78] reports). These provide summary information in respect of safety, daily production, water quality, energy consumption, and key events/issues.

[58] Document: *Training Request - Confined Space 11.5.21 – 1.docx.*
[59] Document: *Copy of Purchase Order – 7300130345.pdf.*
[60] Document: *Confined Space Refresher April 27 and 11 May (2).pdf.*
[61] Document: *Pre-Attendance List Confined Space 27 April Veolia_.docx.*
[62] PowerPoint presentation: *Lab Training 2019 Presentation.pptx.*
[63] For example, Certificate of Completion: *aal-e-ali Introduction to Spill Management 2021 Workplace Chemistry.pdf* [30+ certificates provided].
[64] Sydney Desalination Plant website at: https://sydneydesal.com.au/.
[65] *Water Quality Plan*, appendix A/1 (Element 8).
[66] Document: *Minutes - SDP operations Sept 21.pdf.*
[67] Document: *minutes- SDP operations 24 Aug 22.pdf.*
[68] *Water Quality Plan*, appendix A/1 (Element 10).
[69] Document: *Cover Letter - Monthly Report - August 2022.pdf.*
[70] Document: *Attachment 1_Monthly O&M Report - August 2022.pdf.*
[71] MS Excel workbook: *Attachment 2_August 2022 Safety Report Final (13 Sept).xlsx.*
[72] Document: *Attachment 3_August 2022 Asset Management Report.pdf.*
[73] MS Excel workbook: *Attachment 4_Veolia Safety Dashboard August 2022.xlsx.*
[74] MS Excel workbook: *Appendix C_SDP Monthly Capital Projects Status Report August 2022.xlsx.*
[75] MS Excel workbook: *Appendix D - Residuals and Waste Disposal and Greenhouse Gas Emissions Data.xlsx.*
[76] MS Excel workbook: *Appendix E_SDP Internal Audit Action Tracking August 2022.xlsx.*
[77] Document: *202109 September SDP Monthly Operations Dashboard (00089491xCE34F).pdf.*
[78] Document: *202208 August 2022 SDP Monthly Operations Dashboard (00100597xCE34F).pdf.*

- *Annual Compliance Reports* (for example, the report for the 2021/22 financial year)[79] submitted to IPART; these are further discussed 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:

The long-term evaluation of results is undertaken through the ongoing review of performance data /information provided in the previously referenced internal (Veolia to Sydney Desalination Plant and to the Sydney Desalination Plant Board) reports. Review of a selection of ORG meeting minutes (refer discussion below in respect of Element 12) confirm that such reviews are undertaken.

Audit of drinking water quality management:

The *Water Quality Plan*[80] indicates that a comprehensive program of audits, including internal, second-party and third-party audits (for example this audit), is implemented in respect of the desalination plant. As examples, Sydney Desalination Plant provided reports on a Work Health and Safety Technical Audit undertaken in November 2021[81] and an Environmental Technical Audit undertake in March 2022.[82]

Recommendations arising from these audits were tracked in the *Internal Audit Action Tracking Register*[83] included with the monthly reporting from Veolia to Sydney Desalination Plant.

Element 12 – Review and continual improvement:

Review by senior executive:

The *Water Quality Plan*[84] indicates that management review is undertaken, principally by the Operations Review Group (ORG) comprised of senior Sydney Desalination Plant and Veolia representatives. ORG meetings are held monthly and as indicated in each set of minutes, their purpose is to:

> "*Review performance and quality of the O&M services undertaken by Veolia. A forum to raise any concerns for SDP and Veolia.*
>
> *Review and discussion from the prior month O&M Report.*"

Sydney Desalination Plant provided minutes for a sample of ORG meetings across the audit period.[85] Review of these minutes confirmed that an extensive range of matters including the following (for example) are discussed, with the previously submitted monthly Operations and Maintenance Report (from Veolia to Sydney Desalination Plant) informing the discussion:[86]

- Safety and environment – Safety update; COVID 19 update/current restrictions; Review of monthly O&M report; Pyrozone system; Rain event – flooding of administration building; Reported MTI (medical treatment injury); Executive safety walk action items; and Web-based safety reporting function.
- Operations and maintenance – Veolia operations update/review of monthly report; Emergency Response Notices; New operating rules; Maintenance update; Notifications; Water quality; O&M deficiencies; and Pipeline operation and maintenance.

[79] *Annual Compliance Report* submitted by Sydney Desalination Plant for 2021/22 reporting period (template format), dated 26 August 2022.
[80] *Water Quality Plan*, appendix A/1 (Element 11).
[81] Document: *6416 - SDP Tech Audit 1 - WH S - Report - Rev 1 - Issued (00090573xCE34F).pdf.*
[82] Document: *6416 - SDP Tech Audit 2 - Environmental - Report - Rev 2_Issued - Final (00097363xCE34F).pdf.*
[83] MS Excel workbook: *Appendix E_SDP Internal Audit Action Tracking August 2022.xlsx.*
[84] *Water Quality Plan*, appendix A/1 (Element 12).
[85] Operations Review Group (ORG) Meeting Minutes for meeting held in August, September and November 2020; April, May, September and October 2021; and January, March and April 2022.
[86] Based primarily on items discussed at April 2022 meeting, but typical for meetings across the audit period.

- Compliance – Compliance calendar review; Upcoming Sydney Desalination Plant audit schedule; Update on actions from audit schedule; and External changes.
- Other – Regulatory matters; Capital works; Business continuity planning; Cyber security; Gateway project update; Pipeline renewals project update; and Climate active certification pathway.

This demonstrates extensive review of operations at senior management level.

Drinking water quality management improvement plan:

Sydney Desalination Plant advised that there is no specifically documented improvement plan; however, rationalisation opportunities and improvements are discussed at ORG meetings between Sydney Desalination Plant and Veolia. Review of the above referenced ORG meeting minutes revealed a number of improvements that were initiated/implemented during the audit period, including (for example):

- Veolia to provide revised shutdown management plan (August 2020).
- Veolia to complete and issue learnings from recent Low Flow operational mode (April 2021).
- CCP review was being undertaken (ongoing across the audit period).
- SDP engaged external service providers to undertake operational based audits to drive continuous improvement during FY 2022 (September 2021)
- A Risk Management and Systems Review provided key improvement recommendations (September 2021).
- Veolia to investigate option of trialling an RO sampling panel to improve troubleshooting capability, reduce RO downtime and reduce safety risks (September 2021).
- Veolia to document an asset rotation strategy as part of wider low flow operational philosophy and submit to Sydney Desalination Plant for review and agreement of FY23 arrangements (April 2022).

Improvement and other activities are documented and tracked in a running action list included with each set of minutes.

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 three occasions, nominally annually, during the audit period: in July 2020 (Revision 6), June 2021 (Revision 7) and August 2022 (Revision 8).

Each update involved typically minor amendments. This was demonstrated by provision of the tracked changes version of the most recent update to Revision 8.[87]

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.

[87] Document: *SDP_Water Quality Plan 2022 Final w track changes (00098998xCE34F).pdf.*

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

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.

Target for Full Compliance

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 25 January 2023.
- Site inspection of infrastructure at the Sydney Desalination Plant on 25 January 2023.
- Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.
- MS Excel workbook: *CCP and key water parameter graphs.xlsx*.
- MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx*.
- MS Excel workbook: *Consolidated records of test results across the audit period.xlsx*.
- *Analytical Report 271522* dated 26 September 2022 for samples collected on 19 September 2022 [a sample comprising twelve *Analytical Reports* was provided and reviewed].

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 as *CCP and Key Water Parameter Graphs*. The results of laboratory testing, including verification monitoring, are captured in the *Consolidated Record of Test Results*. 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*[88] and Veolia's IBMS (*Integrated Business Management System Manual*).[89] These monitoring arrangements include online monitoring and both internal and external laboratory testing.

[88] *Water Quality Plan*, section 2.7 and appendix A/1 (elements 4 (operational) & 5 (verification)).
[89] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022, sections 7 & 8.

Operational Monitoring:

Operational monitoring 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).

Considering the CCP parameters identified in the *Water Quality Plan*,[90] Sydney Desalination Plant provided trend charts (*CCP and Key Water Parameter Graphs*)[91] demonstrating that the following parameters (for example) had been monitored throughout the audit period:

- CCP 4 (downstream of Combined Remineralisation Loop) – pH, Turbidity.
- CCP 5 (at Drinking Water Tank) – Free chlorine residual.
- CCP 6 (at Drinking Water Pumping Station) – Turbidity, Monochloramine, Total chlorine, pH, Fluoride.
- CCP 7 (at Shaft 11delivery point) – Total chlorine, Conductivity, pH, Turbidity.

Internal laboratory testing of grab samples is also undertaken in respect of CCP related parameters including (for example):

- CCP 3 (at outlet of Combined Reverse Osmosis) – Boron.
- CCP 5 (at Drinking Water Tank) – Free chlorine residual.
- CCP 6 (at Drinking Water Pumping Station) – Turbidity, Monochloramine, pH, Fluoride.

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

Verification Monitoring:

Requirements in respect of verification monitoring are detailed in the *Internal and External Testing Schedule*,[92] which sets out the requirements for 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.

Records presented in the *Consolidated Record of Test Results*[93] demonstrate that testing has been undertaken as scheduled, except on days that the plant was not operating. This was confirmed by review test results for samples taken at (for example) the Drinking Water Pumping Station.

The consolidated records were also compared to the sample of *Analysis Reports* provided.[94] These confirmed that testing had been undertaken as recorded.

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.

[90] *Water Quality Plan*, appendix B/2.
[91] MS Excel workbook: *CCP and key water parameter graphs.xlsx*.
[92] MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx*.
[93] MS Excel workbook: *Consolidated records of test results across the audit period.xlsx*.
[94] For example, *Analytical Report 271522* dated 26 September 2022 for samples collected on 19 September 2022; [a sample comprising twelve *Analytical Reports* was provided and reviewed].

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 15 January 2023.
- Site inspection of infrastructure at Sydney Desalination Plant on 25 January 2023.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 8, 9 August 2022.
- Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.
- Sydney Water, *Laboratory Services – Chain of Custody Form* in respect of samples collected on 6 September 2022 (file: *Chain of Custody Form.pdf*).
- Sydney Water, *Laboratory Services – Chain of Custody Form* in respect of samples collected on 13 September 2022 (file: *Chain of Custody Form.pdf*).
- *Analytical Report 270857* dated 13 September 2022 for samples collected on 6 September 2022.
- *Analytical Report 271232* dated 20 September 2022 for samples collected on 13 September 2022.
- MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx.*

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

The *Water Quality Plan*[95] references the 'O&M Contract' (not sighted) and Veolia's IBMS (*Integrated Business Management System Manual*)[96] in respect of sampling procedures. The IBMS in turn refers to WIS-8971 *Collection of Water Samples for the Internal and External NATA Laboratory* (not sighted).

Although the specific procedure for collection of samples was not sighted, it is apparent that the requisite details of each sample are retained. For example:

- Samples collected on 6 September 2022:
  - A *Chain of Custody* record[97] (Sydney Water standard format) detailed that samples were taken at the Drinking Water Pumping Station Discharge (sample number: L22068379) and Sea Water Pumping Station Discharge (sample number: L22068431) at 7:48am and 8:24am respectively. In both cases, it was indicated that the samples were to be tested for both daily and weekly analysis test lists.
  - *Analytical Report 270857*[98] provided test results for the abovementioned drinking water sample (sample number: L22068379). The report included a 'Sample summary' page which detailed: Client Sample ID (sampling point); Sample number; Sampling procedure; Date sampled; Date received; and Date authorised (date report was authorised); the time that the sample was collected is recorded on the 'Analytical results' pages of the report. The test results provided are consistent with the test requirements identified in the *Testing Schedule*[99] for daily and weekly analysis.
- Samples collected on 13 September 2022:
  - A *Chain of Custody* record[100] detailed that samples were taken at the Drinking Water Pumping Station Discharge (sample number: L22070429) and Sea Water Pumping Station Discharge (sample number: L22070534) at 8:18am and 8:41am respectively. In both cases, it was indicated that the samples were to be tested for both daily and weekly analysis test lists.
  - *Analytical Report 271232*[101] provided test results for the abovementioned drinking water sample (sample number: L22070429). The report included a 'Sample summary' page which detailed: Client Sample ID (sampling point); Sample number; Sampling procedure; Date sampled; Date received; and Date authorised (date report was authorised); the time that the sample was collected is recorded on the 'Analytical results' pages of the report. The test results provided are consistent with the test requirements identified in the *Testing Schedule* for daily, weekly and monthly analysis.

  It is noted that twelve *Analytical Reports* provided as samples all included this information.

Comparison of the details recorded on both the *Chain of Custody* and *Analysis Report* in respect of sample number: L22068379 reveals that they were consistent, thereby demonstrating that the management of these records is effective. Furthermore, the identified sample records are consistent with those required to be kept under the provisions of the Licence.

Recommendations

There are no recommendations in respect of this obligation.

[95] *Water Quality Plan*, appendix A/1 (element 5).
[96] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.
[97] Sydney Water, *Laboratory Services – Chain of Custody Form* in respect of samples collected on 6 September 2022 (file: *Chain of Custody Form.pdf*).
[98] *Analytical Report 270857* dated 13 September 2022 for samples collected on 6 September 2022.
[99] MS Excel workbook: *2 - TEM-8953-Internal and External Testing Schedule for O&M Phase.xlsx*.
[100] Sydney Water, *Laboratory Services – Chain of Custody Form* in respect of samples collected on 13 September 2022 (file: *Chain of Custody Form.pdf*).
[101] *Analytical Report 271232* dated 20 September 2022 for samples collected on 13 September 2022.

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 25 January 2023.
- Site inspection of infrastructure at the Sydney Desalination Plant on 25 January 2023.
- *Analytical Report 271232* dated 20 September 2022 for samples collected on 13 September 2022.
- *Analytical Report 270857* dated 13 September 2022 for samples collected on 6 September 2022.
- NATA website – scope of accreditation for Sydney Water Laboratory Services (Site No: 56): https://nata.com.au/accredited-organisation/sydney-water-laboratory-services-63-56/.
- NATA website – scope of accreditation for Sydney Water Laboratory Services (Site No: 603): https://nata.com.au/accredited-organisation/sydney-water-laboratory-services-63-603/.
- NATA website – scope of accreditation for ALS Sydney Laboratories (chemistry and biology): https://nata.com.au/accredited-organisation/sydney-chemistry-laboratory-als-life-sciences-environmental-825-10911/?highlight=825 and https://nata.com.au/accredited-organisation/sydney-biology-laboratory-als-life-sciences-environmental-825-14913/?highlight=825.

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

Sydney Desalination Plant engages Sydney Water Laboratory Services to undertake analyses of samples taken for the purposes of verification monitoring. As indicated on its test certificates (*Analytical Reports*),[102] Sydney Water Laboratory Services holds NATA Accreditation No: 63 for compliance with ISO/IEC 17025 – Testing; the approved signatories are identified on each *Analytical Report*.

[102] For example, *Analytical Report 271232* dated 20 September 2022 for samples collected on 13 September 2022.

Testing is undertaken predominantly at the Sydney Water Laboratories, which are located at West Ryde (site numbers: 56 and 603); however, notes on relevant test certificates[103] indicate that testing for Sulphur dioxide is undertaken by ALS which holds NATA Accreditation No: 825 (ALS' Sydney Chemistry (site number: 10911) and Biology (site number: 14913) Laboratories are both included under this accreditation).

Reference to the NATA website confirmed that:

- Sydney Water Laboratory Services' Chemistry Laboratory (site number: 56) is accredited to undertake testing in respect of (for example) Turbidity, Solids – Total dissolved, Fluoride, Nitrogen - Ammonia, Nitrogen - Nitrite, Nitrogen - Nitrate, Nitrogen - Oxidised, Nitrogen - Total, Phosphorus - Total, and Metals (including Boron, Calcium, Magnesium, Potassium and Sodium).[104]
- Sydney Water Laboratory Services' Biology Laboratory (site number: 603) is accredited to undertake testing in respect of (for example) Coliforms and *Escherichia coli* (*E. coli*).[105]

Although the ALS Sydney Laboratories are NATA accredited, as noted on relevant *Analysis Reports*,[103] the accreditation does not cover testing for Sulphur dioxide; this was confirmed by reference to the scope of service provided under the accreditation.[106] However, Sulphur dioxide is not included in the *Drinking water specifications summary table* embedded in the *Water Quality Plan*;[107] nor is it identified as a health-based target in the *Australian Drinking Water Guidelines*. Accordingly, it is assumed to be a quality control (not validation) parameter, in which case the absence of NATA accreditation is not of concern.

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.

[103] For example, *Analytical Report 270857* dated 13 September 2022 for samples collected on 6 September 2022.
[104] NATA website – scope of accreditation for Sydney Water Laboratory Services' Chemistry Laboratory: https://nata.com.au/accredited-organisation/sydney-water-laboratory-services-63-56/.
[105] NATA website – scope of accreditation for Sydney Water Laboratory Services' Biology Laboratory: https://nata.com.au/accredited-organisation/sydney-water-laboratory-services-63-603/.
[106] NATA website – scope of accreditation for ALS Sydney Laboratories: https://nata.com.au/accredited-organisation/sydney-chemistry-laboratory-als-life-sciences-environmental-825-10911/?highlight=825 and https://nata.com.au/accredited-organisation/sydney-biology-laboratory-als-life-sciences-environmental-825-14913/?highlight=825.
[107] *Water Quality Plan*, section 2.7/table 3.1.

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 15 January 2023.
- Site inspection of infrastructure at Sydney Desalination Plant on 25 January 2023.
- Sydney Desalination Plant, *Infrastructure Operating Plan*, Revision 7, 9 August 2022.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 8, 9 August 2022.
- Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.
- Document: *Attachment 1_Monthly Report Sept 2021.xlsx.*
- Document: *Attachment 3_AM KPI Sept 2021.pdf.*
- MS Excel workbook: *Appendix C_Capital Works 2021_09.xlsx.*
- Document: *Attachment 1_Monthly O&M Report - August 2022.pdf.*
- Document: *Attachment 3_August 2022 Asset Management Report.pdf.*
- MS Excel workbook: *Appendix C_SDP Monthly Capital Projects Status Report August 2022.xlsx.*
- Veolia, *Drinking Water Quality Management Procedure for Sydney's Desalination Project* (PRO-9904-1), 15 February 2019.
- Veolia, *Intake and Screening Procedure for Desalination Project* (PRO-9902-2), 6 July 2020.
- Veolia, *RO First & Second Pass Systems Procedure for Sydney's Desalination Project* (PRO-9903-2), 18 September 2020.
- Veolia, *RO CIP, Preservation and Neutralisation* (PRO-9698-1), 16 January 2019.
- Document: *26 November 2021 - SDP NSW Health Qtr Minutes.pdf.*
- Document: *25 August 2022 - SDP NSW Health Qtr Minutes.pdf.*
- Document: *Minutes - SDP operations Sept 21.pdf.*
- Document: *minutes- SDP operations 24 Aug 22.pdf.*
- Document: *SDP_Infrastructure Operating Plan 2022 Final w track changes (00098996xCE34F).pdf.*
- Evidence viewed online, as referenced.

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 of 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.

The business case for a project PLC CPU and I/O Upgrade was reviewed online during the audit interviews. This included an extensive body of information, including Asset details; Locations; Purpose; Redundant/Due for refurbishment; Asset design life; Renewal plan; Function; Functional failure/Consequence; Work during the rebuild project; Maintenance plan; Corrective task completed to date; Proposal (who, what, cost, etc.); and Upgrade methodology.

This example demonstrated that robust investigation and planning that is undertaken in respect of any capital investment, consistent with the intent set out in the *Infrastructure Operating Plan*.

Implementation of capital projects is monitored and reported through Veolia's monthly reports to Sydney Desalination Plant, as evidenced by the September 2021[108,109] and August 2022[110,111] reports.

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 in 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 IBMS (*Integrated Business Management System*).[112] An extensive range of standard operating procedures, including (for example) the following, detail specific aspects of scheme operation:

[108] Document: *Attachment 1_Monthly Report Sept 2021.xlsx*.
[109] MS Excel workbook: *Appendix C_Capital Works 2021_09.xlsx*.
[110] Document: *Attachment 1_Monthly O&M Report - August 2022.pdf*.
[111] MS Excel workbook: *Appendix C_SDP Monthly Capital Projects Status Report August 2022.xlsx*.
[112] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.

- PRO-9904-1 *Drinking Water Quality Management Procedure for Sydney's Desalination Project.*[113]
- PRO-9902-2 *Intake and Screening Procedure for Desalination Project.*[114]
- PRO-9903-2 *RO First & Second Pass Systems Procedure for Sydney's Desalination Project.*[115]
- PRO-9698-1 *RO CIP, Preservation and Neutralisation Procedure.*[116]

In each case, these procedures provide extensive background and procedural guidance in respect of the processes they address. To the extent that an assessment could be made during the audit site inspection, it appeared the plant was being operated in accordance with the relevant operational procedures.

All maintenance activities are managed using Veolia's VAMS computerised maintenance management system CMMS). As an example, maintenance records in respect of Drum Screen #1 were sighted online during the audit interviews and digital report subsequently provided.

Observations include:

- The asset identifier is SCN21211-00 SWI Drum Screen 1.
- Asset hierarchy shows that this item is part of the Seawater System.
- The original installation date was 16 June 2009.
- It has a criticality rating of "2-Medium"; the current condition rating is "3-Average".
- Preventative maintenance schedules include 6-monthly service, 5-yearly anode change service, monthly inspection and 6-monthly inspection service (mothball).
- The maintenance pattern is detailed.
- A listing of maintenance orders demonstrate that monthly inspections have been undertaken; 6-monthly services were undertaken in December 2020, December 2021 and December 2022, with 12-monthly services (which incorporate the 6-monthly service) undertaken in August 2020 (2-yearly), June 2021 and June 2022; and the 5-yearly anode change service was undertaken in January 2021.
- Corrective maintenance was undertaken, including (for example):
  - October 2020 – to check oil, vibration, leak, flow pressure pmp;
  - November 2020 – to remove fishing line wrapped around the shaft;
  - September 2021 – to repair leak detected on air supply pipe to spray valve;
  - September 2021 – to repair leak at potable water piping to sprayers; and
  - February 2022 – to rectify faulty spray flow switches.
- Data/Requisition sheets, which provides all details of/specifications for the screen is included in the asset records.

Maintenance records for the Cartridge Filters (pre-RO) were requested. Sydney Desalination Plant advised that filter cartridges maintenance/replacement is covered under a general operations work order (the cartridges are considered to be a consumable). However, the filter unit casings are considered a pressure vessel; a *Certificate of Inspection – Pressure Equipment* for an inspection of filter casings Serial numbers 685 to 694 undertaken by ABV Inspections on 9 February 2021 was sighted as evidence that regulatory inspections have been undertaken.

[113] Veolia, *Drinking Water Quality Management Procedure for Sydney's Desalination Project* (PRO-9904-1), 15 February 2019.
[114] Veolia, *Intake and Screening Procedure for Desalination Project* (PRO-9902-2), 6 July 2020.
[115] Veolia, *RO First & Second Pass Systems Procedure for Sydney's Desalination Project* (PRO-9903-2), 18 September 2020.
[116] Veolia, *RO CIP, Preservation and Neutralisation* (PRO-9698-1), 16 January 2019.

Asset management/maintenance performance is monitored and reported through Veolia's monthly reports to Sydney Desalination Plant, as evidenced by the September 2021[117,118] and August 2022[119,120] reports. These reports provide details in respect of Asset management metrics; Major maintenance work orders; Work management discipline; Work orders aging; Pitstops and outages; and Asset management improvement deliverables status. Review of these reports reveals that a high level of performance against maintenance targets has been maintained during the audit period.

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 has been discussed in Table A.1 (in respect of WIC Reg Sch 1 cl.7(4)(a)) and a sample of calibration records referenced.

Instrument calibrations are managed using the VAMS maintenance management system. Records for calibration of RO conductivity analysers were reviewed online. These records indicate (for example) that calibration of M2 T2 2P RO ST1 (Module 2, Train 2, Second pass, Reverse Osmosis, Stage 1) permeate analysers was undertaken on 14 March 2022.

In summary, it is assessed that instrument calibration had been maintained, consistent with the maintenance arrangements detailed in the *Infrastructure Operating Plan*, during the audit period.

Capability and Training:

As reported in 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 in respect of (for example): confined space entry; self-contained breathing apparatus; laboratory work; low voltage rescue (excluding and including CPR); and chemical spill management. 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*[121] 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 by (for example):

- Meetings with NSW Health – Minutes of quarterly meetings held on 26 November 2021[122] and 25 August 2022[123] reveal that matters discussed include (for example) operational updates by both parties (as applicable), water quality performance (a *Critical Control Points Report* is provided in each case) and other items such as regulatory submissions, new operating rules, water quality risk assessments. More specifically, the November 2021 meeting included discussion in respect of (for example) proposed new operating rules, development of a new operating protocol between the parties, and arrangements in respect of a proposed CCP review.

[117] Document: *Attachment 1_Monthly Report Sept 2021.xlsx.*
[118] Document: *Attachment 3_AM KPI Sept 2021.pdf.*
[119] Document: *Attachment 1_Monthly O&M Report - August 2022.pdf.*
[120] Document: *Attachment 3_August 2022 Asset Management Report.pdf.*
[121] *Infrastructure Operating Plan*, section 5.
[122] Document: *26 November 2021 - SDP NSW Health Qtr Minutes.pdf.*
[123] Document: *25 August 2022 - SDP NSW Health Qtr Minutes.pdf.*

- Meetings with Sydney Water – Minutes of monthly meetings held on 22 September 2021[124] and 24 August 2022[125] reveal that matters discussed include (for example) safety and environment, plant performance (production and water quality), system performance (water quality and flow schedule), maintenance, communications, and general business. Actions arising from these meetings included (for example) identifying a method for passing maintenance information from Sydney Desalination Plant to Sydney Water; planning of a forum to discuss/share learnings in respect of cyber security; and discussion of arrangements for communication of shutdowns and reduction in capacity.
- An investigation into a Turbidity exceedance in March 2021 identified "Lessons Learnt", which focussed on the manner in which production is increased in response to an emergency ramp up request (effectively refinement of operating procedures.

As reported above, Veolia's monthly reports to Sydney Desalination Plant include details in respect of the status of asset management improvement deliverables. Reported improvements include (for example):[126,127]

- Refresh the asset register – a ground-up rebuild of the asset register to ensure the necessary level of detail and accuracy.
- Review asset criticality – review the criticality of all assets in the plant to ensure the inputs are accurate for other dependent asset management systems.
- Improve work order management – implement a backlog management procedure that prioritises the work in the backlog to ensure resources are allocated to mitigating the key risks of the plant.

These observations demonstrate that Sydney Desalination Plant, in conjunction with Veolia, takes action in pursuit of continual improvement in managing its infrastructure.

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 three occasions, nominally annually, during the audit period: in July 2020 (Revision 5), July 2021 (Revision 6) and August 2022 (Revision 7).

Each update involved typically minor amendments. This was demonstrated by provision of a tracked changes version of the most recent update to Revision 7.[128]

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.

[124] Document: *Minutes - SDP operations Sept 21.pdf.*
[125] Document: *minutes- SDP operations 24 Aug 22.pdf.*
[126] Document: *Attachment 1_Monthly Report Sept 2021.xlsx.*
[127] Document: *Attachment 1_Monthly O&M Report - August 2022.pdf.*
[128] Document: *SDP_Infrastructure Operating Plan 2022 Final w track changes (00098996xCE34F).pdf.*

Table B.2 Infrastructure – Network Operator's Licence Sch A cl 2.1

Clause	Requirement	Compliance Grade
Network Operator's Licence Sch A cl.2.1	In order to ensure the sustainability of water resources in accordance with Principle 7(1)(c) of the *Water Industry Competition Act 2006* (NSW) the Licensee must: a) maintain the Water Industry Infrastructure in accordance with Good Industry Practice; and b) when it operates the Water Industry Infrastructure do so in accordance with Good Industry Practice.	**Compliant**

Risk

This represents medium business risk. Failure to operate and maintain the Water Industry Infrastructure in accordance with Good Industry Practice may compromise the long-term sustainability of the available water resources.

Target for Full Compliance

Evidence that the Licensee has taken action to keep abreast of Good Industry Practice in respect of the operation and maintenance of infrastructure used for the desalination of seawater and has operated and maintained the infrastructure accordingly.

Evidence sighted

- Interviews with Sydney Desalination Plant representatives on 15 January 2023.
- International Desalination Association website at: https://idadesal.org.
- Veolia PowerPoint presentation: *Summary of Desalters Workshop 2022.pptx*.

Summary of reasons for grade

Sydney Desalination Plant demonstrated that it, in conjunction with Veolia, has taken action to keep abreast of developments in industry practice as it relates to the desalination of seawater. It is also apparent from the audit discussions (and evidence referenced elsewhere in this report) that learnings are incorporated into operation and maintenance practices to the extent applicable.

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

Discussion and notes

Compliance with this obligation is deemed to require that Sydney Desalination Plant has taken action to keep abreast of developments in the desalination of seawater, and thereby an understanding of current Good Industry Practice.

In its response to the audit Information Request, Sydney Desalination Plant advised that:

> "*Veolia leverages experience from a global network of 2,928 water and wastewater treatment sites worldwide to deliver best practice design and asset management, and optimisation of operations, particularly in terms of energy recovery and improved operational efficiency. To this end, Veolia and SDP hold quarterly innovation meetings to distil ideas from the global Veolia desalination subject matter experts (Veolia "Desalters" network) to review advancements in desalination and investigate whether they can be implemented on site.*"

Sydney Desalination Plant and Veolia participate in a range of forums, both as presenters and attendees. Both (Veolia through a subsidiary company) are corporate members of the International Desalination Association (IDA), which "… *is the point of connection for the global desalination and water reuse community*".

Both parties participated in the IDA 2022 World Congress held in Sydney in October 2022, of which Sydney Desalination Plant was an acknowledged supporter.[129] A tour of the Sydney Desalination Plant was conducted in conjunction with the congress; thereby providing additional opportunity for knowledge exchange.

As noted above, Veolia Australia participates in internal learning and development workshops in conjunction with its international colleagues. Workshop presentation "Summary of Desalters Workshop 2022" was viewed online during the audit interviews. Topics addressed included (for example) Machine learning; Energy optimisation; Smart membrane tool (for performance optimisation); Performance benchmarking; and KPIs.

Both Sydney Desalination Plant and Veolia also participate in local forums such as the annual Ozwater conference presented by the Australian Water Association, thereby providing further opportunity for knowledge exchange and learning.

Whilst the implementation of learnings gained through these interactions are not readily visible (they are typically embedded as 'business-as-usual' practices, on the basis of the audit discussions it is apparent that Sydney Desalination Plant and Veolia collectively seek to implement best practice to the extent applicable.

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.

[129] International Desalination Association website at: https://idadesal.org.

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	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 15 January 2023.
- IPART, *Network Operator's Reporting Manual and Retail Supplier's Reporting Manual under Water Industry Competition Act 2006; Manual* (Revision 13), 1 April 2022.
- MS Excel workbook: *Wilma Notifications List-22 Dec 2022 11-19.xlsx*.
- *Annual Compliance Report* submitted by Sydney Desalination Plant for 2021/22 reporting period (template format), dated 26 August 2022.
- IPART, *Network Operator Reporting Manual under the Water Industry Competition Act 2006 (NSW)* (Issue 11), 1 July 2020.
- Document: *213_20201120_SDP WQ_Form A (Boron Nov 2020).pdf*.
- Document: *214_20201127_SDP WQ_Form B Incident Closure (Boron Nov 2020).pdf*.
- Document: *234_20210323_SDP WQ_Form A (Turbidity March 2021).pdf*.
- Document: *170_20210330_SDP WQ_Form B (Turbidity March 2021).pdf*.

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 reported two water quality incidents in the appropriate format (i.e. using the standard Incident Forms A and B), and had notified IPART regarding two 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*.[130,131] 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 and explanation of any changes to insurance; and a Financial Capacity Statement are also to be provided. The report is to

[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] Previous versions of the *Reporting Manual* were also in place during the audit period; however, the reporting requirements have not materially changed for the purpose of assessing compliance with this obligation.

be submitted to IPART no later than 31 August each year; accordingly, submission of an *Annual Compliance Reports* in respect of the 2019/20, 2020/21 and 2021/22 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*.

To demonstrate that it had reported as required during the audit period, Sydney Desalination Plant provided a record of *WILMA Notifications*,[132] which listed all reporting and or notifications submitted via the WILMA portal during the audit period. This identified notifications in respect of insurance (as applicable at the time of reporting), notifications in respect of water quality incidents, and that submission of annual compliance reports.

The *Annual Compliance Report*[133] for the 2021/22 financial year was provided as an example. The report was dated 26 August 2022 and was signed by a company Director and Company Secretary. A brief review confirmed that the report contained the requisite information; specifically:

- Schedule A – Non-Compliances: nine technical non-compliances whereby Sydney Desalination Plant had supplied water to Sydney Water pursuant to Emergency Response Notices. This constitutes non-compliance in respect of WIC Act s52(3), which requires compliance with IPART's pricing determination; it was noted that IPART had provided guidance in respect of this issue.
- Schedule B – Performance Indicators: performance against all indicators reported as zero; indictors are not applicable for Sydney Desalination Plant.
- Schedule C – Insurance Certificates of Currency: Certificates of currency provided in respect of 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th & 9th Excess Liability; Director's and Officers' Liability; Industrial Special Risks; Public Liability; Professional Indemnity; Comprehensive Crime (Primary); Comprehensive Crime (Excess); Environmental Impairment Liability – Pollution Legal Liability; Primary Liability; Business Travel; and Umbrella Liability.
- Schedule D – Changes to Insurance: changes to Industrial Special Risks; Liability; Professional Indemnity; and Director's and Officers' Liability policies; and the addition of Comprehensive Crime and 1st excess Crime policies was reported.
- Schedule E – Financial Capacity Statement: no statement was included; however, it is noted that this is to be provided "*(if applicable)*". Although applicability is not specifically detailed in the current version of the *Reporting Manual*, reference to the document history and, in turn, the previous version of the *Reporting Manual*[134] revealed that:

  > "*Licensees that provide small retail customers (ie, households and small businesses) with essential services (ie, potable water and/or sewerage services) must include a financial capacity statement, relating to the licensee's financial capacity, with their annual compliance report.*"

  Accordingly, this requirement is not applicable to Sydney Desalination Plant.

The *WILMA Notifications* register indicated that Sydney Desalination Plant had notified IPART of water quality parameter exceedances on two occasions during the audit period. These, which are discussed in more detail in Table C.2 (in respect of WIC Reg Sch 1 cl.1(2)), included:

- a Boron exceedance that occurred on 19 November 2020; and
- a Turbidity exceedance that occurred on 22 March 2021.

[132] MS Excel workbook: *Wilma Notifications List-22 Dec 2022 11-19.xlsx*.
[133] *Annual Compliance Report* submitted by Sydney Desalination Plant for 2021/22 reporting period (template format), dated 26 August 2022.
[134] IPART, *Network Operator Reporting Manual under the Water Industry Competition Act 2006 (NSW)* (Issue 11), 1 July 2020.

Incident Forms A[135,136] and Incident Forms B[137,138] were submitted in respect of both incidents. Submission dates recorded in the *WILMA Notifications* register (and also embedded in the document file names) indicate that the forms were submitted within the requisite times.

The *WILMA Notifications* register indicates that Sydney Desalination Plant provided "other notifications" in respect of:

- an increase in the BI (Business Interruption) Insurance Limit – notified 5 October 2022; and
- placement of a new Cyber Insurance policy effective 2 December 2022 – notified 13 December 2022.

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.

[135] Document: *213_20201120_SDP WQ_Form A (Boron Nov 2020).pdf.*
[136] Document: *214_20201127_SDP WQ_Form B Incident Closure (Boron Nov 2020).pdf.*
[137] Document: *234_20210323_SDP WQ_Form A (Turbidity March 2021).pdf.*
[138] Document: *170_20210330_SDP WQ_Form B (Turbidity March 2021).pdf.*

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 15 January 2023.
- Sydney Desalination Plant, *Water Quality Plan*, Revision 8, 9 August 2022.
- Document: *213_20201120_SDP WQ_Form A (Boron Nov 2020).pdf.*
- Document: *214_20201127_SDP WQ_Form B Incident Closure (Boron Nov 2020).pdf.*
- Document: *234_20210323_SDP WQ_Form A (Turbidity March 2021).pdf.*
- Document: *170_20210330_SDP WQ_Form B (Turbidity March 2021).pdf.*
- MS Excel workbook: *CCP and key water parameter graphs.xlsx.*
- MS Excel workbook: *Consolidated records of test results across the audit period.xlsx.*
- Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022.
- Veolia, *Incident and Emergency Management Manual for Sydney Desalination Plant* (MAN-9673-5), undated.
- Document: *5 - PRO-9751-Kurnell Water Quality Incident – Physical_Chemical (1).pdf.*
- Document: *4 - PRO-9494-Kurnell Critical Control Point Response Procedures.pdf.*

Summary of reasons for grade

Sydney Desalination Plant advised that two notifiable water quality incidents had occurred during the audit period. It provided details of the incidents and copies of the requisite Incident Forms A & B that had been submitted to IPART in both cases. The reporting also indicated that notification had been provided to NSW Health and Sydney Water (the sole customer/public utility whose infrastructure is connected to Sydney Desalination Plant's infrastructure.

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 other reportable incidents during the audit period.

Based on an brief review of relevant documentation (*Incident and Emergency Management Manual* and related procedures), and the demonstrated 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 it had reported two such water quality incidents during the audit period, details of which are provided below.

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

Reported Events:

General:

Sydney Desalination Plant provided evidence that it had notified other parties as required of water quality parameter exceedances on two occasions during the audit period. These included:

- a Boron exceedance that occurred on 19 November 2020; and
- a Turbidity exceedance that occurred on 22 March 2021.

Review of Sydney Desalination Plant's *WILMA Notifications* register, which lists all reporting and or notifications submitted via the WILMA portal, indicates that these incidents were reported to IPART. Other documentation demonstrates that both NSW Health and Sydney Water were also notified.

Boron exceedance:

Sydney Desalination Plant reported that a Boron exceedance was identified by external (verification) testing of a sample taken from the Drinking Water Pumping Station Discharge on 18 November 2020; a result of 4.62 mg/L had been recorded. Notification was provided by the laboratory at 12:04 on 19 November 2020 and internal investigation confirmed that a notifiable event had occurred at 16:15 on 19 November 2020. Sydney Desalination Plant ceased the production of drinking water and the transfer of water to Sydney Water from 16:50 on 19 November 2020.

The internal investigation comprised internal testing of samples under several operating scenarios, which confirmed the initial result. Following further investigation, including retesting of the original sample by the external laboratory, it was concluded that:

> "*Based on the above, a testing issue with the external labs is the likely cause for the initial Boron result, and this combined with the known issues with the onsite IC testing equipment introduced uncertainty on the product water quality.*
>
> *SDP and the Operator do believe there is negligible water quality risk due to the above. The Operator is in the process of compiling a report with full details of relevant Plant performance data during the period. This will be passed on to NSW Health once complete.*"

Follow-up actions included a meeting with the external laboratory to discuss root cause and future prevention of the laboratory issue, and repair of the internal IC equipment.

In respect of notifications, copies of Incident Form A[139] and Incident Form B[140] indicate that notification was provided to IPART, the Local Public Health Unit (NSW Health), and Sydney Water (public water utility whose infrastructure is connected to the Licensee's infrastructure). This is consistent with the requirements of this obligation.

Turbidity exceedance:

Sydney Desalination Plant reported that a Turbidity exceedance had occurred at Shaft 11 (CCP 7) on 22 March 2021. The operational control setpoint of 0.8 NTU (which has a 1 hour delay before pump shutdown) was reached at 8:20pm; the critical limit of 1.0 NTU was reached shortly thereafter, however, the 2 hour delay before triggering the CCP was not reached before consultation with both Sydney Water and NSW Health. The Drinking Water Pumping Station was shut down in response to the exceedance of the operational control point after the programmed delay.

Inspection/cleaning of the analyser was undertaken and a revised acceptance criteria (agreed with Sydney Water and notified to NSW Health) implemented. It was concluded that an increase in flow under an Emergency Response Notice (requested by Sydney Water) had resulted in agitation of material that had settled in the pipeline under low flow conditions; operational arrangements in low flow production mode may need to be reviewed/revised to avoid a repeat occurrence.

In respect of notifications, copies of Incident Form A[141] and Incident Form B[142] again indicate that notification was provided to IPART, the Local Public Health Unit (NSW Health), and Sydney Water (public water utility whose infrastructure is connected to the Licensee's infrastructure). This is consistent with the requirements of this obligation.

Review of Water Quality Monitoring:

As reported in detail Table A.2 (in respect of Network Operator's Licence Sch B cl.8.1), water quality monitoring undertaken by Sydney Desalination Plant comprises a wide range of both operational monitoring and verification monitoring; this includes continuous online monitoring and both internal and external laboratory testing.

Sydney Desalination Plant provided trend charts (*CCP and Key Water Parameter Graphs*)[143] that present the results of both online and laboratory monitoring of parameters including (for example):

- Online monitoring via SCADA:
  - CCP 4 (downstream of Combined Remineralisation Loop) – pH, Turbidity.
  - CCP 5 (at Drinking Water Tank) – Free chlorine residual.

[139] Document: *213_20201120_SDP WQ_Form A (Boron Nov 2020).pdf.*
[140] Document: *214_20201127_SDP WQ_Form B Incident Closure (Boron Nov 2020).pdf.*
[141] Document: *234_20210323_SDP WQ_Form A (Turbidity March 2021).pdf.*
[142] Document: *170_20210330_SDP WQ_Form B (Turbidity March 2021).pdf.*
[143] MS Excel workbook: *CCP and key water parameter graphs.xlsx.*

- CCP 6 (at Drinking Water Pumping Station) – Turbidity, Monochloramine, Total chlorine, pH, Fluoride.
- CCP 7 (at Shaft 11delivery point) – Total chlorine, Conductivity, pH, Turbidity.

- Laboratory testing of grab samples undertaken both internally and externally:
  - CCP 3 (at outlet of Combined Reverse Osmosis) – Boron.
  - CCP 5 (at Drinking Water Tank) – Free chlorine residual.
  - CCP 6 (at Drinking Water Pumping Station) – Turbidity, Monochloramine, pH, Fluoride.

Review of the results presented in these trend charts did not reveal any other water quality exceedances that would have required notification pursuant to this obligation.

The results of laboratory testing, including both internal and external operational monitoring and external verification monitoring, are captured in *Consolidated Record of Test Results*.[144] This includes results in respect of samples collected at (for example) the Drinking Water Pumping Station Discharge (CCP 6) and Shaft 11 (CCP 7; point of supply to Sydney Water.

Review of these results again revealed no other water quality exceedances that would have required notification pursuant to this obligation.

Incident Notification Arrangements:

The *Water Quality Plan*[145] references a number of documents in respect of incident management, including notification requirements. The Veolia IBMS (*Integrated Business Management System Manual*)[146] provides more detailed guidance in respect of incident management, also including details in respect of incident reporting/notification.

Principal amongst the referenced documents is the *Incident and Emergency Management Manual*,[147] which in turn references a suite of incident management and response procedures. A sample of these procedures, including the *Water Quality Incident – Physical/Chemical Procedure*[148] and *Critical Control Point Response Procedures*,[149] were provided for review; these procedures are presented as detailed flow charts which set out each response action.

The *Incident and Emergency Management Manual* refers specifically to the *Kurnell External Incident Notification Process (PRO-9765)* and *SDP/Veolia Water Quality and Volume Notification Protocol (EXT-9656)* in respect of notification and escalation; however, these were not sighted for the purposes of this audit.

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.

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.

[144] MS Excel workbook: *Consolidated records of test results across the audit period.xlsx.*
[145] *Water Quality Plan*, appendix A/1 (element 6).
[146] Veolia, *Sydney Desalination Plant; Integrated Business Management System Manual (IBMS)* (MAN-9490-8), 15 March 2022, sections 7 & 8.
[147] Veolia, *Incident and Emergency Management Manual for Sydney Desalination Plant* (MAN-9673-5), undated.
[148] Document: *5 - PRO-9751-Kurnell Water Quality Incident – Physical_Chemical (1).pdf.*
[149] Document: *4 - PRO-9494-Kurnell Critical Control Point Response Procedures.pdf.*

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