



Independent Pricing and Regulatory Tribunal

Reporting Manual for Sydney Water Corporation

Water – Reporting Manual
June 2013

Amendment Record

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RM-SWC V3	6 June 2013	Changes to performance indicators and reporting of opportunities for improvement

Inquiries about the Reporting Manual and water licensing in general should be addressed to:

Program Manager, Compliance
Independent Pricing and Regulatory Tribunal of New South Wales
PO Box Q290, QVB Post Office NSW 1230
T (02) 9290 8477

Independent Pricing and Regulatory Tribunal of New South Wales
PO Box Q290, QVB Post Office NSW 1230
Level 8, 1 Market Street, Sydney NSW 2000
T (02) 9290 8400 F (02) 9290 2061
www.ipart.nsw.gov.au

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1 Introduction

The Independent Pricing and Regulatory Tribunal (IPART) is responsible for monitoring, and reporting on, the compliance of Sydney Water Corporation (Sydney Water) with its Operating Licence (Licence).

1.1 Purpose

The purpose of this Reporting Manual is to outline all of Sydney Water's reporting requirements under its Licence including:

- ▼ what information Sydney Water must report
- ▼ when Sydney Water should report, and
- ▼ how Sydney Water should report.

It is a condition of Sydney Water's Licence that it must comply with its reporting obligations set out in this Reporting Manual, and must report to IPART in accordance with this Reporting Manual.¹

The reporting manual does not reproduce the licence obligations for Sydney Water and it is necessary for Sydney Water to refer to the Licence or to any legislation, statutory instrument or document referred to in the licence obligation.

1.2 Definitions and interpretation

Terms that are defined in the Licence have the same meaning in this Reporting Manual, unless the terms are separately defined in this Reporting Manual.

The interpretation provisions in the Licence apply to this Reporting Manual, with all references to the Licence in those provisions taken to be references to this Reporting Manual.

[Note: As at the Commencement Date, the interpretation provisions are contained in clause 14 of the licence.]

¹ Clause 9(a) of the Operating Licence.

1.3 Structure of this Reporting Manual

This Reporting Manual is structured into the following sections:

- ▼ Section 1: details how and when Sydney Water is to report, and
- ▼ Sections 2 to 8: outline the specific reporting requirements for each section of the Licence according to the reporting schedule in Table 1.1.

1.4 Changing this Reporting Manual

We may change this Reporting Manual at any time. In particular, we may change this Reporting Manual to:

- ▼ reflect changes in the applicable law, including the Act
- ▼ include additional reporting obligations where appropriate
- ▼ include references to new Licence obligations
- ▼ delete references to Licence obligations that are no longer relevant
- ▼ amend the information that Sydney Water must provide to IPART and to NSW Health (as the case may be), and
- ▼ improve the reporting process.

Before we change this Reporting Manual significantly, we will consult with Sydney Water and other interested stakeholders. We will then notify Sydney Water and stakeholders of the changes to this Reporting Manual and the start date for any new reporting arrangements. In determining the start date of significant changes, we will make sure there is enough time for Sydney Water to implement new arrangements.

1.5 When should the information be reported?

Sydney Water's reporting schedule is summarised in Table 1.1. We have grouped reporting requirements into:

- ▼ periodic reporting (monthly, quarterly)
- ▼ annual reporting, and
- ▼ intermittent reporting.

Appendix A to this Reporting Manual provides a complete timeline for Sydney Water's reporting requirements under its Licence.

1.6 How should the information be reported?

1.6.1 Reporting to IPART

Sydney Water should report the required information in a clear and concise report. Where this Reporting Manual requires information on more than one area (eg, water quality and environment) at the same time, Sydney Water is encouraged to provide the information in a single report. However, Sydney Water may choose to report the information in separate reports.

The reports must be approved by Sydney Water's Managing Director.

Sydney Water must lodge each report electronically with a hard copy sent by mail. When lodging a report, Sydney Water must also provide the name and contact details (phone, email) of the primary contact with whom IPART can liaise when assessing compliance, and an alternative contact for those times when the primary contact is unavailable.

Electronic reports must be emailed to: compliance@ipart.nsw.gov.au

Hardcopy reports must be sent to:

The Chief Executive Officer
Independent Pricing and Regulatory Tribunal of NSW
PO Box Q290
QVB Post Office NSW 1230

1.6.2 Reporting to NSW Health

Sydney Water must provide reports to NSW Health as outlined in this Reporting Manual.

Sydney Water must lodge each report electronically. When lodging a report, Sydney Water must also provide the name and contact details (phone, email) of the primary contact with whom NSW Health can liaise when assessing compliance, and an alternative contact for those times when the primary contact is unavailable.

Electronic reports must be emailed to: waterqual@doh.health.nsw.gov.au, or to the last email address notified by NSW Health to Sydney Water.

Table 1.1 Summary of Sydney Water’s reporting requirements

Reporting schedule	Water quality	Infrastructure performance	Customer and consumer rights	Complaint and dispute handling	Environment – indicators and management	Water Conservation	Other Reporting
	Section 2 of Reporting Manual	Section 3 of Reporting Manual	Section 4 of Reporting Manual	Section 5 of Reporting Manual	Section 6 of Reporting Manual	Section 7 of Reporting Manual	Section 8 of Reporting Manual
Periodic	Public report – Quarterly monitoring						
	NSW Health report – Monthly (fluoride) & Quarterly (DWQ & RWQ)	-	-	-	-	-	-
Annual	Implementation 5 year DWQMP report	Priority sewerage program report		-	Environmental plan annual report	Annual water conservation report	Audit recommendation status report
	Management of recycled water quality report	System Performance Standards Reporting	-	-			Report on significant changes (if applicable)
							Environmental performance indicators
							Performance indicators
Intermittent	Incident notification - immediate	State of the assets report 1 September 2013				Water usage level review – 30 June 2014	
	5 Year Drinking Water Quality Management Plan		-	-	-		-
	Significant changes to management of water quality	Notification of significant changes to asset management framework					

2 Water quality

This section sets out Sydney Water's reporting obligations for clause 2 of the Licence.

2.1 Periodic reporting

2.1.1 Public reporting

On a quarterly basis (commencing 1 July) Sydney Water must provide a summary of drinking water quality monitoring on the web in a readily accessible location, including all health and aesthetic water characteristics and raw water operational monitoring characteristics identified at Appendix G. The results must be reported on the web within 4 weeks of the end of the quarter and must include:

- ▼ The details of the delivery system.
- ▼ Number of samples in the period.
- ▼ Quarterly performance and rolling 12-month performance against the Health guideline values and aesthetic guideline values as per Appendix G. This does not apply to the raw water operational monitoring characteristics (which may be compared with operational target or guidelines, eg, for cyanobacteria).

[Under clause 2.1(f) Sydney Water must report on monitoring of Drinking Water quality monitoring in the manner and form outlined in the Reporting Manual.]

2.1.2 NSW Health reporting

Monthly

Sydney Water must submit a report on its fluoride monitoring to NSW Health for each month which contains the information required by the Code of Practice for Fluoridation of Public Water Supplies. Sydney Water must submit the report by the second week of the following month.

[Note: Under clause 2.1(e) Sydney Water must comply with monitoring requirements in the Code of Practice for Fluoridation of Public Water Supplies. NSW Health has requested reporting against this Code as a requirement to assess compliance with this

obligation. This is in addition to the reporting requirements outlined for the Australian Drinking Water Guidelines.]

Quarterly

Sydney Water must provide to NSW Health drinking water quality and recycled water quality monitoring reports on an exception² basis for each quarter starting from 1 July. SWC must provide the reports within 6 weeks of the end of the quarter. A copy of the report for the quarter ending 30 June each year must be also provided to IPART as part of the September 1 package.

Each report must include the following information for the quarter reporting:

- ▼ Details of any drinking water exception from the health guideline and aesthetic guideline values outlined at Appendix G and details of any recycled water exception from any guideline values as agreed with NSW Health over the previous 12 months. Details should include test results and the date or period of exception from these guideline values.
- ▼ Appraisal of the exception including discussion of the extent and nature of the exception and an analysis of the risks posed by the exception.
- ▼ Explanation of the causes of the exception and any action to rectify the exception and prevent it re-occurring.

If there are no exceptions in the quarter, the report should state that this is the case.

[Note: Under section 2.1(f) and 2.2(c) of the Licence Sydney Water is required to report on Drinking Water Quality monitoring in the manner and form in this Reporting Manual.]

2.2 Annual reporting

2.2.1 Annual reports on the implementation of the 5-Year Drinking Water Quality Management Plan and recycled water quality management

Annual reports (to be provided to NSW Health and IPART on 1 October each year to cover the previous financial year) must report on the implementation of the 5-Year Drinking Water Quality Management Plan, and all recycled water schemes. The reports must include details on:

- ▼ Activities and programs undertaken in the previous year and corresponding results, including both routine and non-routine monitoring.

² An exception is a test result for a water characteristic that does not meet the relevant Health or Aesthetic Guideline Value for that water characteristic in the ADWG. Non-compliance occurs where the value for a water characteristic observed in testing does not satisfy the long term (12-month) performance requirements set out in the ADWG as determined by NSW Health.

- ▼ Any proposed amendments to management of water quality issues or risks, including any activities and programs proposed for monitoring, operation, maintenance or emergency and incident management.
- ▼ Additional water quality improvement actions for both routine and non-routine monitoring to be implemented in the coming year, including details on the expected outcomes, scope and timeframe of actions.

[Note Sydney Water must manage drinking and recycled water quality, in accordance with the Australian Guidelines for Water Recycling (Licence clauses 2.1 and 2.2). The Australian Drinking Water Guidelines and Australian Guidelines for Water Recycling seek to provide a framework for good management of Drinking and Recycled Water supply. This section of the Reporting Manual requires Sydney Water to report on water quality management, including monitoring of the quality of water under its monitoring programs.]

2.3 Intermittent reporting

2.3.1 Incident and emergency reporting – drinking water and recycled water

Sydney Water must immediately report to NSW Health any incident where there is an exception from a health-guideline value within its drinking water supply system, or its recycled water schemes or any event within either system which may adversely affect public health, as defined in Sydney Water's Standard Operating Procedure *Drinking Water Quality Event Management* developed in consultation with NSW Health.

The reporting of information by Sydney Water will include

- ▼ Maps depicting geographical locations and systems in addition to tables or text if required by NSW Health (not always required).
- ▼ Date and time of incident.
- ▼ Description of nature and extent of the incident (including location/affected area and, if the incident involves or appears to involve a non-compliance with a guideline value).
- ▼ Description of incident (including the delivery system affected or how many customers have been or may be affected).
- ▼ Details of the threat or potential threat to water quality, public health or public safety.
- ▼ Persons notified by Sydney Water of the incident.
- ▼ Results of any monitoring.
- ▼ Status of the treatment system (where applicable).
- ▼ Reason(s) for the incident occurring / possible cause(s) of the incident.

- ▼ Actions taken or proposed to be taken to rectify the incident and its impacts, and prevent the incident from reoccurring.
- ▼ Actual or anticipated date by which incident ceased (eg, risk removed, impact contained/cleaned up, supply fully restored to customers/other licensees, operations restored to normal levels of performance).
- ▼ Any other information required by NSW Health for investigation.

Sampling or monitoring will be necessary where an incident is in relation to water quality. The primary data required for a first sample is to include

- ▼ Date and time of sample.
- ▼ Water quality characteristic(s) and result(s).
- ▼ Relevant guideline(s).
- ▼ Guideline or compliance value.
- ▼ Sample location(s).
- ▼ Water source.
- ▼ Intended purpose of water (for recycled water).
- ▼ Water/recycled water treatment plant operation.
- ▼ Reservoir zones/delivery systems.
- ▼ Disinfection regime.
- ▼ Chlorine residual or other disinfection residual.
- ▼ Additional sampling arranged.
- ▼ Date results are due.

[Note: Under clause 2.1 (drinking water) and 2.2 (recycled water) of the Licence, Sydney Water is to manage drinking water in accordance with the Australian Drinking Water Guidelines and manage recycled water in accordance with the Australian Recycled Water Guidelines. As such, Sydney Water should define "incidents" and develop protocols for external communications and reporting of incidents. This section of the Reporting Manual requires Sydney Water to report these incidents in accordance with these protocols.]

2.3.2 5-year Drinking Water Quality Management Plan

Sydney Water must provide a draft revised 5-Year Drinking Water Quality Management Plan to NSW Health by 31 December 2014.

Sydney Water must provide NSW Health and IPART the Final 5-Year Drinking Water Quality Management Plan (2015-20) by 30 June 2015. Sydney Water is also to provide IPART confirmation from NSW Health that it is satisfied with the plan to at this time.

[Under clause 2.1(c) of the licence Sydney Water is to revise the 5-Year Drinking Water Quality Management Plan.]

2.3.3 Notification of significant changes to the management of Water Quality

Sydney Water must notify NSW Health of any proposed changes to its processes for managing or reporting to NSW Health in relation to drinking water quality under clause 2.1 of the licence or recycled water quality under clause 2.2 of the Licence where such change may have material impact on public health.

[Note: Under clause 2.3 of the Licence, Sydney Water must notify NSW Health of any proposed changes to its management and reporting processes for drinking water or recycled water management.]

2.4 Publically available documents

Sydney Water must make the quarterly drinking water monitoring report summary (referred to in section 2.1.1 of this Reporting Manual) available free of charge on its website for downloading by any person or by phoning the Contact Centre to request a copy by post.

3 Infrastructure Performance

This section sets out Sydney Water's reporting obligations for clause 3 of the Licence.

3.1 Periodic reporting

There is no periodic reporting requirement under this section 3 of the Reporting Manual.

3.2 Annual reporting

3.2.1 Priority sewerage program annual report

Sydney Water must report annually to IPART on its assessment or progress towards the planning and delivery of projects listed in the Priority Sewerage Program (the Program) as referred to in clause 3.6 and Schedule 4 of the Operating Licence. Sydney Water must submit the report by **1 September** after the end of the financial year, or at a later date agreed to by IPART.

The report is to include details of:

- ▼ Any planning and delivery of projects on the Program conducted during the financial year just ended.
- ▼ The current status of any outstanding work on the Program, including an estimate of when construction of sewerage infrastructure could commence in Program locations based on growth and financial assessments of the viability of this work.
- ▼ Details of any delays caused by consent authorities that impair Sydney Water's ability to deliver projects within the Program.
- ▼ Whether OEHL has provided advice that the absence of wastewater services in locations described in the Program is having a significant detrimental impact on the environment and what action Sydney Water has taken to address these concerns.

- ▼ Any direction by the Minister for Finance and Service to complete projects within the Program and what action has been taken by Sydney Water to do this work.

[Note: Under clause 3.6(f) Sydney Water must report annually on its progress in implementing the Priority Sewerage Program in accordance with the Reporting Manual.]

3.2.2 System Performance Standards Reporting

Sydney Water must report annually on the quality and system performance standards. Sydney Water must submit the report by **1 September** after the end of the financial year, or at a later date agreed to by IPART.

The report is to include the following information:

- ▼ Sydney Water's compliance with the system performance standards specified in clause 3.3 of the operating licence in accordance with the template in Appendix B of this Reporting Manual.
- ▼ An explanation of how Sydney Water has met the requirements in the operating licence, which details:
 - Major factors (both positive and negative) that have influenced Sydney Water's performance, including factors that are both within Sydney Water's control and factors beyond Sydney Water's control.
 - Reasons for any significant variation (both positive and negative) between Sydney Water's performance in the financial year with performance in prior years.

[Note: Under clause 3.3 of the Licence, Sydney Water is required to comply with the Water Pressure Standard, Water Continuity Standard and Sewage Overflow Standard. This section of the Reporting Manual requires Sydney Water to report on how it complies with this Licence condition.]

3.3 Intermittent reporting

3.3.1 State of the assets report

Sydney Water must provide a report on the state of each group of assets it manages to IPART by 1 September of every odd numbered year.

The report must include the following details:

- ▼ a description of each group of assets
- ▼ an assessment of the expected capability of the assets to deliver the services and meet the existing obligations consistent with the licence, the customer contract and all applicable laws with which Sydney Water must comply

- ▼ an assessment of the major issues or constraints on current and future performance of the assets
- ▼ the strategies and expected costs of future investment in assets
- ▼ such other matters reasonably required by IPART.

[Note: Under clauses 3.1.1 and 3.1.2 of the Licence, Sydney Water must develop and implement an Asset Management Framework. This section of the Reporting Manual requires Sydney Water to provide a snap shot of these aspects of the Asset Management framework (as implemented) at a point in time.]

3.3.2 Notification of significant changes to asset management framework

Sydney Water must notify IPART of any significant changes to its processes and methodologies established in accordance with clause 3.1.2 of the Licence which may have material impact on the asset management framework.

[Note: Under clause 3.2 of the Licence, Sydney Water must advise IPART of any significant changes to processes and methodologies established as a component of the Asset Management Framework.]

3.4 Publicly available documents

Sydney Water is not required to make specific documents or reports relating to infrastructure performance monitoring publicly available.

4 Customer and Consumer Rights

4.1 Periodic reporting

There is no periodic reporting requirement under this section 4 of the Reporting Manual.

4.2 Annual reporting

There is no annual reporting requirement under this section 4 of the Reporting Manual.

4.3 Intermittent reporting

There is no intermittent reporting requirement under this section 4 of the Reporting Manual.

4.4 Publicly available documents

Sydney Water must make the:

- ▼ Customer Contract (including any variations to it)
- ▼ pamphlet that explains the Customer Contract, and
- ▼ procedures for customer hardship, debt, water flow restrictions and disconnections

available free of charge:

- ▼ on its website for downloading by any person, and
- ▼ via post by phoning the Contact Centre to request a copy.

[Note: Under clause 4.1, 4.2.1, 4.2.2 and 4.4 of the Licence Sydney Water is to provide information about the customer contract, customer hardship, debt, water flow restrictions and disconnections to customers to any person free of charge upon request.]

5 Complaint and dispute handling

This section sets out Sydney Water's reporting obligations for clause 5 of the Licence.

5.1 Periodic reporting

There is no periodic reporting requirement under this section 5 of the Reporting Manual.

5.2 Annual reporting

There is no annual reporting requirement under this section 5 of the Reporting Manual.

5.3 Intermittent reporting

There is no intermittent reporting requirement under this section 5 of the Reporting Manual.

5.4 Publicly available documents

Sydney Water must provide customers at least annually with:

- ▼ information concerning its internal complaints handling procedure which explains how to make a complaint and how the complaints handling procedure works
- ▼ a pamphlet that explains how the external disputes resolution scheme works and how it can be accessed.

[Note: Under clause 5.1 and 5.2 of the Licence Sydney Water is to provide information internal and external complaints and dispute handling to customers.]

6 Environment – indicators and management

This section sets out Sydney Water’s reporting obligations for clause 6 of the Licence.

6.1 Periodic reporting

There is no periodic reporting requirement under this section 6 of the Reporting Manual.

6.2 Annual reporting

6.2.1 Environment plan annual report

Sydney Water must report by no later than 1 October each year to IPART on its actions to implement the Environment Plan, including:

- ▼ Any significant changes to the Environment Plan, including but not limited to environmental programs or timetables to achieve targets.
- ▼ Its performance for the previous financial year in meeting the targets and timetables outlined in the Environment Plan.
- ▼ Details on the programs, management actions proposed, and performance against these action proposals for:
 - Heritage and environmentally sensitive areas under Sydney Water’s control, such as Botany Wetlands
 - Waste management and energy management across its operations

[Note: Under clause 6.1(c) of the Licence Sydney Water must provide IPART with an annual progress report outlining details of Sydney Water’s progress with the environmental objectives targets and timetable in the 5-Year Environmental Plan.]

6.3 Intermittent reporting

There is no intermittent reporting requirement under this section 6 of the Reporting Manual.

6.4 Publicly available documents

Sydney Water must make the 5-year environment plan available free of charge on its website for downloading by any person or by phoning the Contact Centre to request a copy by post.

7 | Water conservation

This section sets out Sydney Water's reporting obligations for clause 7 of the Licence.

7.1 Periodic reporting

There is no periodic reporting requirement under this section 7 of the Reporting Manual.

7.2 Annual reporting

7.2.1 Water Conservation Annual Report

Sydney Water must report annually on Sydney Water's water conservation activities. Sydney Water must submit the report by **1 September** after the end of the financial year, or at a later date agreed to by IPART.

The report is to comprise of the following elements:

Water usage level

As a component of the Water Conservation Report, Sydney Water must report to IPART on the water usage level as referred to in clause 7.1 of the Operating Licence. The report must include details of:

- ▼ Sydney Water's compliance with the water usage level in clause 7.1 of the Operating Licence.
- ▼ The quantity of potable water drawn from all sources, expressed in litres per person per day, both uncorrected for weather effects and corrected for weather effects.

- ▼ A list of projects that Sydney Water plans to undertake in the current financial year to achieve the water usage level including a description of each project, an estimate of the amount of water that will be saved as a result of each project and an estimate of the cost of each project. These projects should be consistent with the goals and objectives outlined in the Water Conservation Strategy Document³.
- ▼ An update on the projects that Sydney Water has undertaken in the previous financial year to achieve the water usage level (as provided to IPART as a forecast in the previous report) including:
 - a description of each project
 - the amount of water that was saved as a result of each project, and
 - the cost of each project.

[Note: Under clause 7.1 of the Licence, Sydney Water must meet its water usage level. This section 7.2.1 requires Sydney Water to report on its compliance with the water usage level as well as the actions it has taken or proposes to take to maintain such compliance.]

Water leakage

As a component of the Water Conservation Report, Sydney Water must report to IPART on water leakage as referred to in clause 7.2 of the Operating Licence. The report must include details of:

- ▼ The amount of water leakage from its drinking water supply system during the preceding financial year, using the definition and methodology set out in the latest version of “National Performance Framework: Urban performance reporting, indicators and definitions Handbook” published by the National Water Commission and the Water Services Association of Australia.
- ▼ The methodology for calculating Water leakage should address the uncertainty in this quantity. Please note that IPART has determined specific uncertainty bands for determining this water leakage quantity⁴.

³ As required by clause 7.5 of the Operating Licence.

⁴ IPART has determined that measured leakage which does not exceed the range of 105±16ML/day constitutes compliance with the Water Leakage Level set out in clause 7.2(a) of the Operating Licence. Clause 7.2(c) of the Operating Licence requires Sydney Water to report the results of a review of the Economic Level of Leakage to IPART by 31 December 2011. This review has been completed and IPART is in the process of making a recommendation to the Minister. Based on IPART’s recommendations on this review, the Minister may adjust the Water Leakage Level requirement in clause 7.2(a)

- ▼ The report on water leakage must include discussion of the major factors that have influenced the water leakage performance, including factors that are both within Sydney Water's control and factors beyond Sydney Water's control and reasons for any significant variation between performance in the preceding financial year and prior years. Relevant factors would likely include flow measurement, system water pressure management, the effectiveness of maintenance, any research into leakage from the water supply system and a discussion of issues covered in the dot points below.
- ▼ The number of bursts, breaks or leaks (in the trunk and reticulation component of Sydney Water's drinking water system between water treatment plants and a property) which occurred in the immediately preceding financial year and the average time taken by it to repair those bursts, breaks or leaks.
- ▼ The number of kilometres of reticulation mains it inspected during the preceding financial year for water leakage.
- ▼ Sydney Water's program during the preceding financial year for inspecting reservoir zones for water leakage and for rehabilitating reservoir zones to prevent or correct water leakage.
- ▼ How these leakage activities contributed to the objectives and targets outlined in the Metropolitan Water Plan.
- ▼ To provide context, the report should also include the economic level of water leakage for the preceding financial year and how that level of water leakage was calculated.

Water efficiency

As a component of the Water Conservation Report, Sydney Water must report to IPART on its water efficiency program as referred to in clause 7.3 of the Operating Licence. The report must include details of:

- ▼ Water efficiency projects planned for the current financial year, together with an estimate of the cost and the expected water savings for each project.
- ▼ Water efficiency projects advised to IPART in the previous report that were undertaken in the previous financial year, together with the actual cost and the actual water savings achieved.
- ▼ How these water efficiency activities contributed to the objectives and targets outlined in the Metropolitan Water Plan.

Water recycling

As a component of the Water Conservation Report, Sydney Water must report to IPART on its water recycling program as referred to in clause 7.4 of the Operating Licence. The report must include details of:

- ▼ Sydney Water's efforts to promote and encourage water recycling
- ▼ Water recycling projects undertaken by Sydney Water, the end use of water used and the annual usage of recycled water in each scheme, and
- ▼ How these water recycling activities contributed to the objectives and targets outlined in the Metropolitan Water Plan.

[Note: Under clause 7.5(c) of the Licence, Sydney Water must report annually on its progress in implementing its water conservation strategies detailed in the 5-Year Water Conservation strategy developed in accordance with clause 7.5(a) of the Licence.]

7.3 Intermittent reporting

7.3.1 End of term review of Sydney Water's water usage level

In accordance with clause 7.1(e) of the Licence Sydney Water must prepare a report on the water usage level as part of the end of term review. Sydney Water must submit this report to IPART by 30 June 2014 or at another date agreed to by IPART.

[Note: Under clause 7.1(e), Sydney Water must undertake a review of the water usage level as part of the end of term review of this licence.]

7.4 Publicly available documents

Sydney Water must make the:

- ▼ Annual report on Sydney Water's progress in implementing its water conservation strategy required under clause 7.5 (c) or of the Licence
- ▼ 5-Year Water Conservation Strategy Document

available free of charge on its website for downloading by any person.

8 Other Reporting

8.1 Audit recommendations

Sydney Water must report to IPART annually on the status of any audit recommendations identified in the most recent Operational Audit and outlined in IPART's audit report to the Minister.

Sydney Water must submit the audit recommendations status report to IPART by 31 March each year (or at a later date agreed to by IPART).

[Note: Under clause 8.1 of the Licence, IPART or an Auditor may undertake an Operational Audit. This section 8.1 requires Sydney Water to report on the status of implementing recommendations identified in an Operational Audit.]

8.2 Audit opportunities for improvement

Sydney Water may, but is not required to, report to IPART on the implementation of any opportunities for improvement identified in our report to the Minister on the results of the audit.

Sydney Water should provide this information with the status update on audit recommendations, if it chooses to report on opportunities for improvement. This information may be considered by an auditor in the subsequent annual audit.

[Note: IPART requirements for opportunities for improvement are set out in the Audit Guideline – Public Water Utilities.⁵]

8.3 Statement of compliance

Our PWU audit guideline specifies the information that IPART requires for a statement of compliance.⁶ Sydney Water's statement of compliance must be provided in accordance with our PWU audit guideline.

⁵ IPART, *Audit Guideline – Public Water Utilities*, May 2013, Appendix D.

⁶ IPART, *Audit Guideline – Public Water Utilities*, May 2013, Appendix B.

[Note: Under clause 8.1, IPART may undertake an Operational Audit on Sydney Water's compliance with Licence. As part of the audit process, Sydney Water must provide a statement of compliance which identifies any non-compliance of which Sydney Water is aware.]

8.4 Performance indicators

Sydney Water is required to submit to IPART by 1 September each year the majority of its performance indicators as part of the annual compliance and performance report. Performance against environmental indicators (Appendix D) is reported separately and must be submitted by 1 October each year, along with the Environment Plan Annual Report.

The majority of indicators have been developed by the National Water Commission (NWC) as part of the "National Benchmarking Framework for Rural and Urban Water Utilities". These indicators notated as "NWI Indicators" in Appendix F. The list of NWI indicators is correct as at June 2012. However it is the responsibility of the utility to ensure they are aware of any revisions to the list. The remaining indicators are specific to Sydney Water's operations and are notated as "IPART Indicators" (Appendices D-F).

[Note: IPART prepares an annual performance report on the public water utilities (including Sydney Water). The National Water Commission also prepares an annual national performance report of all urban water utilities (including Sydney Water). Both of these reports are publicly available.]



Appendices

A Timeline for Reporting

Table A.1 Timing of regular reporting and auditing under the Sydney Water Operating Licence

Date	Report to	Required Report
2 nd week of January	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
28 January	NSW Health	Summary of quarterly drinking water quality monitoring data posted on Sydney Water website for 1 October – 31 December (Sect 2.1.1)
2 nd week of February	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
11 February	NSW Health	<ul style="list-style-type: none"> ▼ Quarterly Drinking Water Quality Monitoring Report for 1 October – 31 December (Sect 2.1.2) ▼ Quarterly Recycled Water Quality Monitoring Report for 1 October – 31 December (Sect 2.1.2)
2 nd week of March	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
2 nd week of April	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
28 April	NSW Health	Summary of quarterly drinking water quality monitoring data posted on Sydney Water website for 1 January – 31 March (Sect 2.1.1)
2 nd week of May	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
12 May	NSW Health	<ul style="list-style-type: none"> ▼ Quarterly Drinking Water Quality Monitoring Report for 1 January – 31 March (Sect 2.1.2) ▼ Quarterly Recycled Water Quality Monitoring Report for 1 January – 31 March (Sect 2.1.2)
2 nd week of June	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
2 nd week of July	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
28 July	NSW Health	Summary of quarterly drinking water quality monitoring data posted on Sydney Water website for 1 April – 30 June (Sect 2.1.1)
2 nd week	NSW	Monthly Fluoride monitoring report (section 2.1.2)

Date	Report to	Required Report
of August	Health	
11 August	NSW Health	<ul style="list-style-type: none"> ▼ Quarterly Drinking Water Quality Monitoring Report for 1 April – 30 June (Sect 2.1.2) ▼ Quarterly Recycled Water Quality Monitoring Report for 1 April – 30 June (Sect 2.1.2)
1 September	IPART	<ul style="list-style-type: none"> ▼ Annual Compliance and Performance Report to IPART (electronic copy with hard copy following in mail), comprising: <ul style="list-style-type: none"> – System Performance Standards Report (Section 3.2.2) – Performance Indicators (with the exception of Environmental Indicators; Section 8.3) – Water Conservation Annual Report (Section 7.2.1) – Priority Sewerage Program Annual Report (Section 3.2.1)
	NSW Health	<ul style="list-style-type: none"> – Quarterly Drinking Water Quality Monitoring Report for 1 April – 30 June (Section 2.1.2). – Quarterly Recycled Water Quality Monitoring Report for 1 April – 30 June (Section 2.1.2).
2 nd week of September	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
1 October	IPART NSW Health and IPART	<ul style="list-style-type: none"> ▼ Environment Plan Annual Report and Environmental Indicators ▼ Annual report on implementation of the five-year Drinking Water Quality Management Plan (Section 3.1.3) ▼ Annual report on management of recycled water quality (Section 3.2.2)
2 nd week of October	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
28 October	NSW Health	Summary of quarterly drinking water quality monitoring data posted on Sydney Water website for 1 July – 30 September (Sect 3.1.1)
2 nd week of November	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)
11 November	NSW Health	<ul style="list-style-type: none"> ▼ Quarterly Drinking Water Quality Monitoring Report for 1 July – 30 September (Sect 3.1.2) ▼ Quarterly Recycled Water Quality Monitoring Report for 1 July – 30 September (Sect 3.2.1)
2 nd week of December	NSW Health	Monthly Fluoride monitoring report (section 2.1.2)

Table A.2 Timing of submission of plans and state of the assets reports by Sydney Water

Date	Plan submitted to	Event	Status
30 September 2010	IPART	5-Year Environment Plan (2010- 2015)	Completed
1 October 2010	NSW Health	Draft Drinking Water Quality Management 5-Year Plan (2010-2015)	Completed
31 December 2010	NSW Health and IPART	Final Drinking Water Quality Management 5-Year Plan (2010-2015), together with confirmation from NSW Health that it is satisfied with the plan	Completed
31 December 2010	IPART	5-Year Water Conservation Strategy Document (2010-2015)	Completed
31 December 2011	IPART	Review to determine the Economic Water Leakage Level	Completed
1 September 2013	IPART	State of the assets report	
30 June 2014	IPART	Report on the review of Sydney Waters water usage level	
31 December 2014	NSW Health	Draft Drinking Water Quality Management 5-Year Plan (2015-2020)	
30 June 2015	NSW Health and IPART	Final Drinking Water Quality Management 5-Year Plan (2015-2020), together with confirmation from NSW Health that it is satisfied with the plan.	
1 September 2015	IPART	State of the assets report	

Note: The requirements to submit these plans are provided by clauses 2.1, 6.1 and 7.5 of the Operating Licence. This timeline is included in this Reporting Manual for the sake of completeness and guidance.

B System Performance Standards, Response Times and Water Conservation Requirements

Table B.1 on the following page sets out System Performance Standards, Response Times and Water Conservation outcomes that must be reported to IPART.

Important Note: The data in the following table must be accompanied by an explanation of the performance against the requirements in the Operating Licence which details:

- ▼ Major factors (both positive and negative) that have influenced this performance, including factors that are both within Sydney Water’s control and factors beyond Sydney Water’s control.
- ▼ Reasons for any variation (both positive and negative) between performance in the preceding financial year and prior years.

Table B.1 System Performance Standards, Response Times and Water Conservation Requirements

Standard #	Standard	Outcome
SPS 1	Number of properties that experience a water pressure failure, as defined in clause 3.3.1 of the Operating Licence, in the preceding financial year	
SPS 2	Number of properties that experience an unplanned water interruption exceeding 5 hours, as defined in the Operating Licence, in the preceding financial year	
SPS 3	Number of properties that experience 3 or more unplanned water interruption exceeding 1 hour, as defined in the Operating Licence, in the preceding financial year	
SPS 4	Number of properties (other than public properties) that experience an uncontrolled sewage overflow in dry weather, as defined in the Operating Licence, in the preceding financial year	
SPS 5	Number of properties (other than public properties) that experience 3 or more uncontrolled sewage overflows in dry weather, as defined in the Operating Licence, in the preceding financial year	
RT 1	Percentage of Priority 6 breaks/leaks in drinking water mains (as defined in the Operating Licence) that Sydney Water attended within 3 hours	
RT 2	Percentage of Priority 5 breaks/leaks in drinking water mains (as defined in the Operating Licence) that Sydney Water attended within 6 hours	
RT 3	Percentage of Priority 4 breaks/leaks in drinking water mains (as defined in the Operating Licence) that Sydney Water attended within 5 days.	
WC 1	The quantity of potable water that Sydney Water has drawn from all sources in the preceding financial year (L/person/day)	
WC 2	The amount of water leakage from the Drinking Water Supply System, averaged for the preceding financial year (ML per day)	

C | IPART performance indicators – infrastructure

The tables in this appendix set out infrastructure performance indicators required to be provided to IPART as follows:

IPART Indicator No.	Indicator	Definitions
I 1	The number of properties affected by an unplanned water interruption duration of more than 1 hour and less than or equal to 5 hours.	<p>Property means any real property to which either or both of the following conditions apply:</p> <ul style="list-style-type: none"> a. the real property is connected to the water utility's drinking water supply system, to the water utility's sewerage system or to the water utility's recycled water system and a charge for the services provided by one or more of those systems is levied on the owner of the real property b. the real property is within a declared stormwater drainage area for which the utility imposes a stormwater charge upon the owner of real property in that area.
I 2	Occurrence of water interruptions to affected properties (i.e. the number of properties experiencing 3 or more Planned and Unplanned water interruptions) of more than one hour duration)	<p>Water Interruption means any event causing a total loss of water supply due to any cause. Water interruption excludes those caused by bursts or leaks in the service connection to internal plumbing or planned meter replacements. All interruptions not subject to notification caused by third parties or a power failure should be included. Exclude instances of reduced service levels due to, for example, low pressure. If a property experiences more than one interruption then it should be counted for each event. A water supply interruption, which causes loss of supply to 100 customers, is counted as 100 customer interruptions.</p>
I 3	Events leading to planned or unplanned water interruption where 250 or more properties experience an interruption of over 5hrs duration.	<p>Planned water interruption – water interruption initiated by the water utility for which at least 24 hours notice has been given to the customer.</p> <p>Unplanned water interruption means an interruption in which an occupier of a property has not received at least 24 hours notification of the interruption or an interruption that has occurred prior to the expiry of any notice provided to an occupier advising of an interruption. It also includes outages where the duration exceeds that originally notified. In this case the entire outage is classed as unplanned</p>
I 4 (S)	The number of residential properties affected by planned water supply interruptions in peak hours (5am-9am and 5pm-11pm)	<p>Property as per I 1.</p> <p>Planned water interruption as per I 1</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. For the purpose of this indicator, property refers to only residential properties. 2. Interruptions spanning any part of the peak period are to be included.

IPART Indicator No.	Indicator	Definitions
I 5	The number of properties in the water utility's drinking water supply network experiencing a water pressure failure which is occasional or recurrent, but not permanent	<p>Property as per I 1.</p> <p>A property experiences a water pressure failure if a pressure of less than 15 metres head is experienced for a continuous period of 15 minutes or more measured at the point of connection of the Property and the water utility's water supply system, usually at the point of connection known as the "main tap". For the purpose of this indicator:</p> <ul style="list-style-type: none"> (a) where connected properties are in multiple occupancy, each separately billed or occupied part shall be counted as one connected property. Connected properties currently unoccupied shall be included. (b) a Property is taken to have experienced a water pressure failure at each of the following times: <ul style="list-style-type: none"> (i) when a person notifies the water utility that the Property has experienced a water pressure failure and that water pressure failure is confirmed by the water utility; or (ii) when the water utility's systems identifies that the Property has experienced a water pressure failure; and (c) a Property will not be taken to have experienced a water pressure failure only because of a short term operational problem (such as a main break), which is remedied within four days of its occurrence or from abnormal demand (such as demand during fire fighting).

IPART Indicator No.	Indicator	Definitions
I 6	Number of High Priority sewage overflows per 100 km of sewer main responded to in a year	<p>High Priority sewage overflow is an event assessed by the water utility as:</p> <ul style="list-style-type: none"> (a) a public health concern (b) likely to amount to significant damage to property (c) likely to have a significant environmental impact (d) an interruption of the sewerage service. <p>Medium Priority sewage overflow is an event assessed by the water utility as likely to amount to:</p>
I 7	Number of Medium Priority sewage overflows per 100 km of sewer main responded to in a year	<ul style="list-style-type: none"> (a) minor property damage (b) minor environmental impact (including unpleasant odours) not posing a significant health risk. <p>The utility has defined problem codes of 'sewerage surcharge', 'plumber confirmed choke' or 'internal surcharge'. The number of events to be used is the number recorded under these codes determined to be priority High or Medium jobs.</p> <p>Note: High Priority is equivalent to a Priority 6 for Sydney Water or Priority 1 for Hunter Water. Medium Priority is equivalent to a Priority 5 for Sydney Water or Priority 2 for Hunter Water.</p>
I 8	Number of residential customers' dwellings affected by sewer spills not contained within 1 hour of notification	<p>Residential customer means a customer who: owns real property which is used as a principal place of residence.</p> <p>Property as per I 1.</p> <p>Sewer spills refers to a sewer spill caused by a fault in the water utility's sewerage system that discharges to a customer's dwelling. It does not include spills caused by faults in the service connection or house connection branch and the house service line.</p> <p>Contained means the sewage spill has ceased or has been alleviated. It does not include sewer spills caused by faults or blockages in the customer's pipes.</p>

D | IPART performance indicators – environment

The tables in this appendix set out performance indicators required to be provided to IPART as follows:

IPART Indicator No.	Indicator detail	Definitions
E 1	Total number of proceedings and Penalty Notices under the Protection of the Environment Operations (POEO) Act 1997 issued to the water utility	<p>Proceedings refer to proceedings in connection with the POEO Act for prescribed offences.</p> <p>Penalty Notice is a notice to the effect that, if the person served with the notice does not wish to have a specified penalty offence dealt with by a court, the person may pay the penalty prescribed under section 227 for the offence:</p>
E 2	Total number of proceedings and Penalty Notices under the <i>Protection of the Environment Operations (POEO) Act 1997</i> issued to contractors engaged by the water utility.	<p>Note for E2 -this indicator refers to penalty notices which contractors inform the water utility were incurred whilst they were conducting works for the corporation. Each breach notice will be reported on the date that the contractor informed the water utility, not on the date the penalty was incurred or the date the notice was issued to the contractor.</p>
E 3	Total electricity consumption by water assets (kWh/ML of water supplied to be included).	<p>Water supplied is the total metered volume of water (potable or non-potable) supplied to customers over the reporting period plus estimated non-metered water supplied. This comprises the sum of residential water supplied, commercial, municipal and industrial water supplied and other water supplied (includes estimated non-metered water supplied). It includes recycled water and urban stormwater used but excludes agricultural irrigation, environmental water and managed aquifer recharge.</p>
E 4	Total electricity consumption by sewer assets (KWh/ML of sewage collected).	<p>Sewage treated is the total volume of sewage collected by the water utility, measured as treatment plant inflow, plus sewage treated by another business on behalf of the water utility e.g., wholesaler. This measure should equal the sum of volumes reported for residential, non-residential and non-trade waste collected and trade waste collected.</p>
E 5	Electricity consumption from renewable sources or generated by the water utility expressed as a percentage of total electricity consumption.	<p>Renewable energy is electricity sourced from non-fossil fuel sources.</p>

IPART Indicator No.	Indicator detail	Definitions
E 6 (S)	Total volume of Controlled Sewage Overflows that occur in dry weather, expressed as a percentage of total sewage effluent discharged to the environment.	<p>Controlled Sewage Overflow is a Sewage Overflow that is directed by Sydney Water via a designed structure to a predetermined location such as a stormwater system or waterway in order to prevent overloaded or blocked sewers from discharging at sensitive locations, on private property or within buildings thus endangering public health or causing a public nuisance.</p> <p>Sewage means untreated liquid waste received in the reticulation system (includes the wastewater from homes, offices, shops, factories and other premises discharged to the sewer).</p> <p>Sewage overflow – the discharge of untreated, diluted or partially treated sewage from the sewerage system which may occur in dry weather or in wet weather.</p> <p>Dry weather overflow means where a sewer overflow has been caused by an identified blockage in the utility's sewerage system (e.g., tree root intrusion) or a system failure not related to capacity (e.g., pumping station failure). It is a sewage overflow occurring when there is dry weather flow in the sewer, as determined by Sydney Water's hydraulic sewer system model.</p> <p>Effluent means sewage that has received all of the designed treatment processes at the water utility's sewage treatment plant.</p> <p>For this indicator, total sewage effluent discharged to the environment is inclusive of wet weather flows.</p> <p>Note: Indicator E 6 (S) is calculated as follows: Total Volume of all overflows from controlled structures as % = [Total Volume of all overflows from controlled structures] / [Total volume (treated effluent + overflows from control structures networks)].</p>
E 7 (S)	Percentage of trade waste customers in compliance with their wastewater discharge limits as outlined in their water utility trade waste agreements.	<p>Trade Waste is any waste water generated from or as a result of an industrial or commercial activity undertaken, other than at domestic or household premises.</p> <p>Note: For the purpose of this indicator, customers refers to industrial customers only, and not commercial customers.</p> <p>Trade Waste agreement means a written contract authorising discharge of trade wastewater to the water utility's sewerage system and requiring compliance with set terms and conditions.</p>
E 8	Total mass of biosolids produced by the water utility	<p>Biosolids means the stabilised organic solids derived from sewage treatment processes.</p> <p>Total Mass means the quantity in dry tonnes of biosolids captured and removed from sewage treatment plants.</p>

IPART Indicator No.	Indicator detail	Definitions
E 9	Percent of solid waste recycled or reused expressed as a percentage of solid waste generated	<p>Solid Waste is any solid substance that is discarded, rejected, unwanted, in surplus or abandoned. It does not include gas, energy, water, wastewater, biosolids diverted for beneficial reuse and reuse water.</p> <p>Recycled means the conversion of waste materials into a usable product or resource. The process of recycling includes the diversion or extraction of the material from the waste stream; the collection and sorting of recyclable materials; and the processing of those materials into products which can then be used (or sold for use). Materials are deemed to have been recycled when they are transferred to a facility for processing or manufacturing (e.g., a recycling centre). Energy recovery (or waste-to-energy) is another form of recycling, which involves recovery of latent energy rather than a physical resource.</p> <p>Re-use is the application of a diverted waste product to a subsequent use which may be the same or different from the original purpose, and which extends the life of the product, but without further manufacture. Beneficial re-use is generally taken to mean that the form of re-use delivers some benefit (economic, social or environmental).</p>
E 10 (S)	Total mass of solid waste generated by the water utility	<p>Native vegetation indicators will be an estimate based on the production of the water utility's Environmental Management Plans and documents, or triggered by Flora and Fauna studies. It will only be reported above 0.01 Hectares.</p> <p>The definition of Native Vegetation will be derived from the <i>Native Vegetation Act 2003</i> (NV Act). The Objects of the NV Act provide guidance as to what needs to be considered when assessing whether an area will be included in the vegetation loss figures.</p> <p>Note: Indicator will include works undertaken by or on behalf of the water utility on land that is not owned by the water utility, such as offsetting impacts to one area by rehabilitation or replanting at another site.</p>
E 11	Total area of clearing of native vegetation.	
E 12	Total area of native vegetation rehabilitated.	
E 13	Total area of native vegetation gain due to rehabilitation, replanting and protection by the water utility.	
E 14	Total number and nature of proceedings or Penalty Notices of conditions under licences issued to the water utility by NOW for water management	<p>Proceedings refers to proceedings in connection with the Water Management Act for prescribed offences.</p> <p>Penalty notice means a notice to the effect that, if the person served with the notice does not wish to have an alleged offence dealt with by a court, the person may pay, in accordance with the notice, the penalty specified in the notice.</p> <p>NOW means the NSW Office of Water.</p>

E | IPART performance indicators – customers

The tables in this appendix set out performance indicators required to be provided to IPART as follows:

IPART Indicator No.	Indicator detail	Definitions
C 1	The percentage of complaints resolved within 10 business days	<p>Complaint is defined in AS ISO 10002-2006 or the most recent up-date of that standard. This AS ISO defines a complaint as an expression of dissatisfaction made to an organisation, related to its products, or the complaints-handling process itself, where a response or resolution is explicitly or implicitly expected.</p> <p>The following examples are intended to provide some clarity to this definition.</p> <ul style="list-style-type: none"> – A contact requesting information is not a complaint. – A contact reporting a service difficulty or fault is not a complaint and these contacts are recorded separately. – A contact expressing dissatisfaction with repeat service difficulties and faults is a complaint. – A contact where a credit adjustment on the account has been made due to a meter misread is a complaint. – A contact that results in a water quality issue is a complaint (i.e., due to particles, discolouration, smell, taste, or a health issue). – A contact that results from an internal sewage overflow is a complaint. – Any Civil actions taken through a court for loss or damage arising from the water utility's performance under the Customer Contract is a complaint. – Complaints regarding repeat service difficulties or faults where they are from separate customers arising from the same cause, are counted as separate complaints. – More than one complaint from the same customer arising from the same cause are reported separately. – A complaint that is registered with EWON is a corporation complaint. – A contact regarding a matter that is not the responsibility of the Corporation is not recorded as a complaint. – A contact regarding flooding the water utility's Stormwater is considered to be a complaint. <p>Resolution of a complaint means that:</p> <ol style="list-style-type: none"> a. the complaint is resolved to a customer's satisfaction, or b. the customer is provided with an explanation as to why no further action is proposed in relation to the complaint, or

IPART Indicator No.	Indicator detail	Definitions
		c. the customer is provided with a date when the issue will be resolved if the complaint is relating to future planned operational or capital works.
C 2	Percent of calls abandoned	
C 3	Percent of metered accounts of customers that receive a bill not based on a business meter read for one year.	<p>Customer means any person who is taken to have entered into a Customer Contract with the water utility.</p> <p>A metered account refers to water usage metered account, which is billed based on volume. If a property has multiple meters and each metered account receives a separate bill based on a meter read, these should be reported as separate metered accounts for the purposes of this indicator. If a property has multiple meters and a single account is issued due to common ownership, the meters will also be treated as separate metered accounts for the purposes of this indicator.</p> <p>A customer meter read is one, which is provided by the customer to the utility.</p> <p>A business meter read is one taken by the utility or its contractor.</p>
C 4	The total number of residential customers disconnected for non-payment of amounts owed to the water utility.	<p>Residential customer means a customer who owns real property which is used as a principal place of residence.</p> <p>Non-Residential customer means all customers not classified as a residential. Customer.</p> <p>Disconnection means the stopping (either temporarily or permanently) of water supply to a customer's property.</p>
C 5	The total number of non-residential customers disconnected for non-payment of amounts owed to the water utility.	<p>Flow Restriction means a direct intervention in the water supply system by the utility in order to reduce flow to a customer's property.</p>
C 6	Total number of residential customers on whom water flow restrictions have been imposed	
C 7	Total number of non-residential customers on whom water flow restrictions have been imposed	

IPART Indicator No.	Indicator detail	Definitions
C 8	Number of residential customers per 1000 residential properties experiencing financial difficulty who are being assisted through the water utility's hardship program or payment plans.	<p>Residential customer as per C4.</p> <p>Property means any real property to which either or both of the following conditions apply:</p> <ol style="list-style-type: none"> the real property is connected to the water utility's drinking water supply system, sewerage system or recycled water system and a charge for the services provided by one or more of those systems is levied on the owner of the real property; the real property is within a declared stormwater drainage area for which the water utility imposes a stormwater charge upon the owner of real property in that area. <p>Payment plan is a plan for a residential customer experiencing payment difficulties to pay a retailer by periodic instalments, any amount payable by the customer. A payment plan must only include an arrangement in which the customer is paying off an arrears component (of any overdue amount) and must consist of at least three instalments.</p>
C 9	<p>Percentage of residential customers in C 8 who are:</p> <ol style="list-style-type: none"> not meeting ongoing water and sewerage costs (debt increasing) covering ongoing water and sewerage costs (debt stable) covering ongoing costs and portion of arrears (debt reducing). 	Residential customer as per C4.
C 10	<p>Percentage of residential customers in C 8 who pay by:</p> <ol style="list-style-type: none"> Payment plan Centrepay 	<p>Residential Customer as per C 4.</p> <p>Payment plan as per C 8.</p> <p>Centrepay is a service offered by Centrelink that allows customers to pay their water bills by having an amount deducted from their Centrelink payments and paid directly to the water utility.</p>
C 11	<p>Break up by percentage of residential customers who no longer meet C 8 by exiting the water utility's hardship program or payment plans because:</p> <ol style="list-style-type: none"> they have paid off their outstanding debt they have been flow restricted other 	Flow restriction as per C 4.

F | NWI Indicators

Note: this list of NWI Indicators is current at June 2012. It is the responsibility of the utility to ensure it is reporting against the most current set of NWI indicators. NWI indicators and definitions are found in the National Benchmarking Framework for Rural and Urban Water Utilities indicators and definitions handbook, published on the NWC website.

The performance indicator sets are grouped under the following headings:

- ▼ water resources
- ▼ asset data
- ▼ customers
- ▼ environment
- ▼ pricing and finance
- ▼ public health.

NWI Health Indicators

NWI H 1	Water quality guidelines
NWI H 2	Number of zones where microbiological compliance was achieved (e.g., 23/24)
NWI H 3	Percent (%) of population where microbiological compliance was achieved
NWI H 4	Number of zones where chemical compliance was achieved (e.g., 23/24)
NWI H 5	Risk-based drinking water quality management plan externally assessed
NWI H 6	Risk-based drinking water quality management plan (specify plan in place ISO9001, HACCP, ADWG Aquality assessment)
NWI H 7	Public disclosure of drinking water quality performance (yes/no)

NWI Asset Indicators

Water and Sewerage Assets

NWI A 1	Number of Water Treatment Plants providing full treatment
NWI A 2	Length of water mains (km)
NWI A 3	Properties served per km of water main
NWI A 4	Number of sewerage treatment plants
NWI A 5	Length of sewerage mains and channels (km)
NWI A 6	Properties served per km of sewer main
NWI A 7	Number of recycled water treatment plants

Water and Sewer breaks and leakage

NWI A 8	Number of water main breaks (per 100km water main)
NWI A 9	Infrastructure leakage index (ILI)
NWI A 10	Real losses (L/service connection/d)
NWI A 11	Real losses (kL/km water main/d)
NWI A14	Sewerage breaks and chokes (number per 100km sewer main)
NWI A 15	Property connection breaks and chokes (number per 1000 properties)

NWI Environmental Indicators

NWI E 1	Percent of sewage treated to a primary level
NWI E 2	Percent of sewage treated to a secondary level
NWI E 3	Percent of sewage treated to a tertiary or advanced level
NWI E4	Percent of sewage volume treated that was compliant (%)
NWI E5	Number of sewage treatment plants compliant at all times (eg, 5/6)
NWI E 6	Public disclosure of sewage treatment plant performance
NWI E7	Compliance with environmental regulator – sewerage (yes/no)
NWI E8	Percent of biosolids reused
NWI E 9	Greenhouse gas emissions (tonnes CO ₂ equivalents) – water (per 1000 properties)
NWI E 10	Greenhouse gas emissions (tonnes CO ₂ equivalents) – sewerage (per 1000 properties)
NWI E 11	Net Greenhouse gas emissions (net tonnes CO ₂ equivalents) – Other (per 1000 properties)
NWI E 12	Total Net Greenhouse gas emissions (net tonnes CO ₂ equivalents) (per 1000 properties)
NWI E13	Sewer overflows reported to environmental regulator (per 100km of sewer main)

NWI Customer Indicators

Connected properties and population

NWI C 1	Population receiving water supply services (000s)
NWI C 2	Connected residential properties – water supply (000s)
NWI C 3	Connected non-residential properties – water supply (000s)
NWI C 4	Total connected properties – water supply (000s)
NWI C 5	Population receiving sewerage services (000s)
NWI C 6	Connected residential properties – sewerage (000s)
NWI C 7	Connected non-residential properties – sewerage (000s)
NWI C 8	Total connected properties – sewerage (000s)

Complaints

NWI C 9	Water quality complaints (per 1000 properties)
NWI C 10	Water service complaints (per 1000 properties)

NWI C 11	Sewerage service complaints (per 1000 properties)
NWI C 12	Billing and account complaints – water and sewerage (per 1000 properties)
NWI C 13	Total water and sewerage complaints (per 1000 properties)
NWI C 14	Percentage of calls answered by an operator within 30 seconds (%)

Service Interruption

NWI C15	Average duration of unplanned interruption – water (minutes)
NWI C16	Average sewerage interruption (minutes)
NWI C17	Average frequency of unplanned interruption – water
NWI C 18	Number of restrictions applied for non-payment of water bill (per 1000 properties)
NWI C 19	Number of legal actions applied for non-payment of water bill (per 1000 properties)

NWI Pricing Indicators

NWI P 1	Water Tariff Structure (description)
NWI P 1.1	Free Water Allowance (kL/property)
NWI P 1.2	Fixed Water Charge (\$/property)
NWI P 1.3	Usage Water Charge 1 st step (\$/kL)
NWI P 1.4	Usage Water Charge 2 nd step (\$/kL)
NWI P 1.5	Usage Water Charge 3 rd step (\$/kL)
NWI P 1.6	Usage Water Charge 4 th step (\$/kL)
NWI P 1.7	Usage Water Charge 5 th step (\$/kL)
NWI P 1.8	Usage Water Charge 6 th step (\$/kL)
NWI P 1.9	Usage Water Charge 7 th step (\$/kL)
NWI P 1.10	Usage Water Charge 8 th step (\$/kL)
NWI P 1.11	Usage Water Charge 9 th step (\$/kL)
NWI P 1.12	Special Water Levies (\$)
NWI P 1.13	Income from Special Water Levies Retained by Utility? (Yes/No)
NWI P 2	Annual water bill based on 200kL/a
NWI P 2.1	Average Annual Residential Water Supplied

NWI P 3	Typical Residential Water Bill
NWI P 3.1	Number of Water Meter Readings per annum
NWI P 3.2	Number of Water Bills per annum
NWI P 4	Sewerage Tariff Structure
NWI P 4.1	Sewerage Fixed Charge
NWI P 4.2	Sewerage Usage Charge
NWI P 4.3	Special Sewerage Levies (\$)
NWI P 4.4	Income from Special Sewerage Levies Retained by Utility? (Yes/No)
NWI P 5	Annual sewerage bill based on 200kL/a
NWI P 6	Typical Residential Sewerage Bill
NWI P 6.1	Number of Sewerage Bills per annum
NWI P 7	Annual water and sewerage bill based on 200kL/a
NWI P 8	Typical Residential water and sewerage bill

NWI Finance Indicators

NWI F 1	Total Revenue – water (\$000)
NWI F 2	Total Revenue – sewerage (\$000)
NWI F 3	Total Income for utility (\$000)
NWI F 4	Residential revenue from usage charges – water (%)
NWI F 5	Revenue per property for water supply services (\$/property)
NWI F 6	Revenue per property for sewerage services (\$/property)
NWI F 7	Income per property for utility (\$/property)
NWI F 8	Revenue from Community Service Obligations (%)
NWI F 9	Written down replacement cost of fixed water supply assets (\$000s)
NWI F 10	Written down replacement cost of fixed sewerage assets (\$000s)
NWI F 11	Operating cost – water (\$/property)
NWI F 12	Operating cost – sewerage (\$/property)
NWI F 13	Combined operating cost water and sewerage (\$/property)

NWI F 14	Total water supply capital expenditure (\$000s)
NWI F 15	Total sewerage capital expenditure (\$000s)
NWI F 16	Total capital expenditure for water and sewerage (\$000s)
NWI F 17	Economic real rate of return - water
NWI F 18	Economic real rate of return – sewerage
NWI F 19	Economic real rate of return – water and sewerage
NWI F 20	Dividend (\$000s)
NWI F 21	Dividend payout ratio (%)
NWI F 22	Net Debt to equity %
NWI F 23	Interest coverage ratio
NWI F 24	Net profit after tax (NPAT) (\$000's)
NWI F 25	Community Service Obligations (\$000s)
NWI F 26	Capital works grants – water (\$000s)
NWI F 27	Capital works grants – sewerage (\$000s)
NWI F 28	Water supply capital expenditure (\$/property)
NWI F 29	Sewerage capital expenditure (\$/property)
NWI F 30	NPAT Ratio (%)

NWI Water Resources and Asset Indicators

Sources of Water – Volume of water sourced:

NWI W1	- Surface Water (ML)
NWI W2	- Groundwater (ML)
NWI W3	- Desalination (ML)
NWI W4	- Recycling (ML)
NWI W5	- Bulk Supplier (ML)
NWI W6	- Volume of bulk recycled water purchased (ML)
NWI W7	Total volume of water sourced (ML)

Volume of water supplied (uses of supplied water)

NWI W8	– Residential (ML)
NWI W9	– Commercial, municipal and industrial (ML)
NWI W10	– Other (ML)
NWI W11	Total urban water supplied (ML)
NWI W12	Average annual residential water supplied (kL/property)
NWI W13	– Environmental flows (ML)
NWI W14	– Bulk water exports (ML)
NWI W15	– Bulk recycled water exports (ML)

Sewage collected

NWI W16	Volume of sewage collected – residential sewage, non-residential sewage and trade waste (ML)
NWI W17	Volume of sewage collected – Trade waste (ML)
NWI W18	Total sewage collected (ML)
NWI W 19	Sewage collected per property (kL per property)

Uses of recycled water

NWI W 20	– Residential (ML)
NWI W 21	– Commercial, municipal and industrial (ML)
NWI W 22	– Agricultural (ML)
NWI W23	– Environmental (ML)
NWI W24	– On-site (ML)
NWI W25	– Other (ML)
NWI W26	Total of recycled water supplied (ML)
NWI W27	Recycled water (per cent of effluent recycled)
NWI W28	Total volume of urban stormwater discharges from a stormwater discharge point
NWI W29	Total volume of treated and untreated sewage discharges from a sewage discharge point

G Drinking Water health and aesthetic water characteristics and raw water operational monitoring characteristics

Important note:

The following table outlines the characteristics to be monitored as required by NSW Health under ADWG 2011. The characteristics and/or the guideline values will only be changed between versions of the Reporting Manual with the written approval of NSW Health.

The assessment of long term performance for both health and aesthetic characteristics is detailed below:

Evaluating long term microbial performance – in agreement with NSW Health at least 98% of scheduled samples collected over the preceding 12 months contain no *E. coli* (or thermotolerant coliforms).

Evaluating long term health related chemicals – the 95th percentile statistic calculated for the previous 12 months must be less than the guideline value.

Evaluating long term aesthetic characteristics – the mean value (or average) of results over preceding 12 months must be less than the guideline value.

Table G.1 Drinking water health and aesthetic water characteristics and raw water operational monitoring characteristics

Drinking Water Quality –					
Characteristics	ADWG 2011 recommendation		Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
	Location	Frequency			
micro-organisms					
<i>E. coli</i> (or thermotolerant coliforms)	supply to consumer/distribution system	at least weekly (number of samples based on population)	H	not detected/100 mL' (reported as <1orgs/100 mL)	Key parameter – monitored as per ADWG 2011. An indicator of faecal contamination from warm blooded animals.
physical characteristics					
dissolved oxygen	supply to consumer/distribution system	monthly	A	>85% sat.	Some treatment processes may reduce DO content.
hardness (as CaCO ₃)	supply to consumer/distribution system	monthly if water treated for hardness, otherwise quarterly	A	200	Hardness is caused by calcium and magnesium salts. All water supplied by Sydney Water is relatively soft.
pH	supply to consumer/distribution system	fortnightly	A	6.5-8.5	Key risks are buffering problems at WFPs and cement lined mains leaching lime and causing higher pH.
taste	supply to consumer/distribution system	annually -complaints	A	acceptable (3)	May indicate undesirable contaminants. Source of problem often difficult to identify. Can occur from problems such as algae, biofilm, chlorine, dissolved solids and metals such as iron, copper manganese and zinc.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
odour	supply to consumer/ distribution system	annually -complaints	A	acceptable (3)	May indicate undesirable contaminants. Source of problem often difficult to identify. Can occur from problems such as algae, biofilm, chlorine, dissolved solids and metals such as iron, copper manganese and zinc.
temperature	supply to consumer/ distribution system	weekly (normally measured when a microbiological sample is taken)	A	no value	Carried out as standard procedure with Coliform analysis. Rapid changes may bring complaints.
total dissolved solids	supply to consumer/ distribution system	quarterly	A	600	This characteristic is unlikely to vary significantly throughout the system. A high TDS can be caused by high levels of salts which can have adverse effects on some industrial processes.
true colour	supply to consumer/ distribution system	monthly	A	15	Sources of colour in water can include iron, manganese, humic and fulvic acids and dissolved plant components. Colour removal occurs in the treatment process.
turbidity	supply to consumer/ distribution system	monthly	A	5 NTU	NSW Health requires inclusion for compliance purposes. Higher turbidity may shield some micro-organisms from disinfection and create a chlorine demand. Caused by presence of suspended matter. Can be of health concern in that particulates may comprise toxic

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
material or absorb them. Turbidity is removed through water treatment processes.					
Inorganic chemicals					
Disinfection Agents and Inorganic By-products of Disinfection					
bromate	supply to consumer/distribution system	weekly if ozonation used, otherwise not required	H	0.02	Ozonation not used as a primary disinfectant. Monitoring not required.
chloramine – see monochloramine	supply to consumer/distribution system	weekly if used as a disinfectant			See monochloramine
chlorine (free)	supply to consumer/distribution system	weekly if used as a disinfectant	H A	5 0.6	Key parameter. Used as a primary and secondary disinfectant. Unlikely to exceed health guideline value except in exceptional circumstances. Aesthetic guideline value is routinely exceeded to minimise microbiological risks.
monochloramine	supply to consumer/distribution system	weekly if used as a disinfectant	H	3	Used as disinfectant in chloraminated systems. Odour threshold for monochloramine is 0.5 mg/L.
other inorganic chemicals					
aluminium (acid-soluble)	supply to consumer/distribution system	weekly if aluminium salts used in clarification	A	0.2	Usually associated in drinking water with use of Aluminium salts in flocculation, or from clay soils. Alum salts are no longer used by Sydney Water.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
ammonia (as NH ₃)	supply to consumer/ distribution system	monthly	A	0.5	Key characteristic – monitored in all delivery systems as of 2003/04. Ammonia is added at WFPs for disinfection purposes. Apart from addition for disinfection purposes, may indicate presence of sewage contamination and/or microbiological activity.
antimony	supply to consumer/ distribution system	quarterly	H	0.003	May result from use of antimony-tin solder – not used by Sydney Water on water mains or treatment processes.
arsenic	raw water	quarterly	H	0.01	Possibly from natural sources. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
asbestos	supply to consumer/ distribution system	annually if at all		none	Asbestos pipe accounts for less than 1% of pipe in Sydney Water's area. The LGAs with most existing asbestos pipe are the Blue Mountains, Hawkesbury and Fairfield. Not for routine compliance monitoring as there is no guideline value. Refer to Section V (Fact Sheets) in ADWG 2011.

Drinking Water Quality –

Characteristics	ADWG 2011 recommendation		Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
	Location	Frequency			
barium	raw water	quarterly	H	2	Barium can occur naturally from exposure to barium containing rocks. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
beryllium	raw water	annually if at all	H	0.06	Can occur from the weathering of rocks and burning of fossil fuels. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
boron	raw water	Quarterly	H	4	From natural leaching of minerals and contamination, possibly from seawater intrusion. Monitor for North Richmond only. Raw water monitoring is the responsibility of SCA for other systems.
cadmium	supply to consumer/ distribution system	quarterly/specific investigation	H	0.002	Can occur from industrial or agricultural contamination or from galvanised pipe or fitting corrosion. There are still significant quantities of galvanised pipe in use for main to meter water services, although no longer installed.
chloride	supply to consumer/ distribution system	quarterly	A	250	Not considered to be a problem for Sydney's water supply, from natural mineral salts or effluent contamination.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
chromium (as Cr(VI))	supply to consumer/ distribution system	quarterly	H	0.05	From industrial/agricultural contamination of raw water or corrosion of plumbing materials. Classified as human carcinogen.
copper	supply to consumer/ distribution system	monthly / specific investigation	H A	2 1	Potential for copper levels to occur due to corrosion of copper fittings by soft water. Sydney has soft water. A key WQ characteristic monitored each year.
cyanide	supply to consumer/ distribution system	annually if at all	H	0.08	From industrial wastes and some plants and bacteria.
fluoride	supply to consumer/ distribution system	weekly if fluoridated, otherwise quarterly	H	0.9 - 1.5	Fluoride is added to the water at all WFPs. Can also occur naturally in some waters from fluoride-containing rocks. The ADWG 2011 health guideline for fluoride is 1.5 mg/. Sydney Water measures fluoride against the Fluoridation of Public Water Supplies Act 1957 which requires fluoride to be between 0.9 and 1.5 mg/L. This characteristic is unlikely to vary significantly throughout each WFP system.
hydrogen sulfide	supply to consumer/ distribution system	monthly	A	0.05	Formed in water by sulfate-reducing micro-organisms or hydrolysis of soluble sulfide under anoxic conditions. Aesthetic guideline value only.

Drinking Water Quality –

Characteristics	ADWG 2011 recommendation		Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
	Location	Frequency			
iodide	raw water	annually if at all	H	0.5	From mineral and salt deposits. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
iron	supply to consumer/ distribution system	fortnightly, or weekly if used as coagulant	A	0.3	Key parameter. Iron (ferric chloride) is added as a coagulant aid at WFPs. Occurs naturally in water. Can result from corrosion of iron pipes. Can stain laundry Iron bacteria can block pipework, cause taste/odour and corrosion.
lead	supply to consumer/ distribution system	monthly/specific investigation	H	0.01	Occurs in water from dissolution from natural sources or from pipes and fittings containing lead. There still exist old lead jointed mains in the Sydney area.
manganese	supply to consumer/ distribution system	fortnightly	H A	0.5 0.1	Key parameter. Occurs naturally in water, higher in oxygen depleted water. Can cause staining and taste. Less than 0.05 mg/L is desirable. Problems with manganese have been experienced in the past in several systems.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
mercury	raw water	quarterly	H	0.001	Very low concentrations occur naturally. From industrial emissions/spills or possibly contaminant in chemicals. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
molybdenum	raw water	quarterly	H	0.05	From mining, agriculture or fly-ash deposits from coal fuelled power stations. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
nickel	supply to consumer/ distribution system	quarterly / specific investigation	H	0.02	From nickel plated fittings.
nitrate	supply to consumer/ distribution system	monthly	H	50 as NO ₃	Key characteristic in chloraminated systems. Occurs naturally. From intensive farming and sewage effluent. Presence is more likely in chloraminated systems where ammonia is used in conjunction with chlorine, for disinfection purposes.
nitrite	supply to consumer/ distribution system	monthly	H	3 as NO ₂	Key characteristic in chloraminated systems. Presence is more likely in chloraminated systems where ammonia is used in conjunction with chlorine, for disinfection purposes.

Drinking Water Quality –

Characteristics	ADWG 2011 recommendation		Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
	Location	Frequency			
selenium	raw water	quarterly	H	0.01	Generally low levels in natural water. Can occur from selenium concentrations in some soil. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
silver	raw water	annually if at all	H	0.1	May occur in very low concentrations in natural waters from natural sources and industrial wastes. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
sodium	supply to consumer/ distribution system	quarterly	A	180	Natural component of water. Drinking water is generally a minor contributor to the total dietary intake of sodium.
sulfate	treated water	quarterly	H A	500 250	Natural component of water, and may be added via treatment chemicals. Aluminium sulfate is not used as a coagulant at WFPs. Copper sulfate is not used to control algae in storage dams. Not considered to warrant further monitoring at this time. Possible inclusion within next 3 years for background data.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
tin	raw water	annually if at all		none	Concentration in water is very low. One of least toxic metals. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond. Not for routine compliance monitoring as there is no guideline value.
zinc	supply to consumer/ distribution system	monthly / specific investigation	A	3	Key characteristic. Usually occurs from corrosion of galvanised pipes, fittings and brasses. Adverse health effects from zinc are believed to relate more from too low intake rather than too high.
organic compounds					
acrylamide	treated water	quarterly	H	0.0002	Acrylamide occurs as a minor impurity in polyacrylamide. It may be contained in some polymers used as filter aids at water filtration plants or as a coagulant before thickening on recycle systems.
benzene	raw water	annually if at all	H	0.001	From atmospheric deposition and chemical plant effluent. Human carcinogen. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.

Drinking Water Quality –

Characteristics	ADWG 2011 recommendation		Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
	Location	Frequency			
carbon tetrachloride	treated water	quarterly	H	0.003	Sometimes occurs as impurity in chlorine used for disinfection. Also used in manufacture of chlorofluoromethane, in fire extinguishers, solvents and cleaning agents.
chlorobenzene	raw water	annually if at all	H A	0.3 0.01	From spills and discharges. Monitor in event of spill only. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond. No routine monitoring.
dichlorobenzenes	raw water	annually if at all			Could occur from spills, discharges or leaching from contaminated soils. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
1,2-dichlorobenzene (1,2-DCB)			H A	1.5 0.001	
1,3-dichlorobenzene (1,3-DCB)			A	0.02	
1,4-dichlorobenzene (1,4-DCB)			H A	0.04 0.0003	
dichloroethanes	raw water	annually if at all			Possibly from industrial effluents, spills, discharges or atmospheric deposition. Monitor for 1,2-dichloroethane at North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
1,1-dichloroethane				none	
1,2-dichloroethane			H	0.003	

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
dichloroethenes 1,1-dichloroethene (1,1-DCE) 1,2-dichloroethene (1,2-DCE)	raw water	annually if at all	H	0.03	Rarely found in drinking water. Found occasionally in ground water from wells heavily contaminated by solvents. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
			H	0.06	
dichloromethane (methylene chloride)	raw water	annually if at all	H	0.004	Used in manufacture of paint removers, insecticides, solvents and cleaners. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
epichlorohydrin	treated water	annually if at all	H	0.0005	Used in manufacture of some resins used in water treatment and as raw material in the manufacture of flocculants. According to ADWG 2011 the health guideline value is below the limit of detection with current analytical procedures however previous testing in Australia has detected at levels as low as 0.0002 mg/L.
ethylbenzene	raw water	annually if at all	H A	0.3 0.003	Component of petrol and petroleum products. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.

Drinking Water Quality –**ADWG 2011 recommendation**

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
ethylenediamine tetraacetic acid (EDTA)	raw water	annually if at all	H	0.25	Metal complexing agent widely used in industry and agriculture. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems. Lab with NATA accredited method not identified.
hexachlorobutadiene	raw water	annually if at all	H	0.0007	Industrial solvent. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.
nitrilotriacetic acid (NTA)	raw water	annually if at all	H	0.2	Chelating agent in laundry detergents. May enter water through sewage contamination. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems. Lab with NATA accredited method not identified.
dialkyltins tributyltin oxide	raw water	annually if at all	H	None 0.001	Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems. NATA accredited or equivalent method not identified.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
plasticisers di(2-ethylhexyl) phthalate (DEHP) di(2-ethylhexyl) adipate (DEIqA)	supply to consumer/ distribution system	annually if at all	H	0.01 None	Used in all flexible PVC products and may leach from these over a long time. Could also occur from spills. PVC pipe accounts for less than 5 % of water mains and has only been used in limited amounts in the last 20 years. Usage is increasing. Monitor for di(2-ethylhexyl) phthalate (DEHP) only.
polycyclic aromatic hydrocarbons (PAHs) Benzo-(a)-pyrene	supply to consumer/ distribution system	annually if at all	H	0.00001	Contamination can occur through atmospheric deposition, or leaching from bituminous linings. Bituminous lining is not generally used in water mains but was used on steel reservoirs prior to 1990. Monitor for background data, for compliance purposes at customer's tap.
styrene (vinylbenzene)	raw water	annually if at all	H A	0.03 0.004	Possibly from industrial contamination. Can be used in manufacture of plastics, synthetic rubbers, resins and insulators. Monitor for North Richmond only. Raw water monitoring is responsibility of SCA for other systems.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
tetrachloroethene	raw water	annually if at all	H	0.05	Dry cleaning solvent and metal degreaser. Could occur in drinking water from spills Routine monitoring not required. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond.
toluene	supply to consumer/ distribution system	annually if at all	H A	0.8 0.025	Occurs naturally in petrol and natural gas, forest fire emissions. Could occur in drinking water from atmospheric deposition, industrial contamination, leaching from protective coatings in storage tanks.
trichlorobenzenes (total)	raw water	annually if at all	H A	0.03 0.005	Industrial chemical used as a solvent, dielectric fluid and in polyester dyeing. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond.
1,1,1-trichloroethane	raw water	annually if at all		None	Industrial chemical. Could occur from spills. Routine monitoring not required. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond.

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
trichloroethylene (TCE)	raw water	annually if at all		None	Used as a solvent in dry cleaning, refrigerant and fumigant. Could occur from spills. Routine monitoring not required. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond.
vinyl chloride	raw water	annually if at all	H	0.0003	Used in production of PVC resins for building and construction. Used in manufacture of early PVC pipes – no longer used. Sydney Water does not have any quantities of PVC pipes made with this compound. Could occur from spills. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond.
xylene	supply to consumer/ distribution system	annually if at all	H	0.6	Could occur in drinking water as a pollutant, or from solvent used for bonding plastic fittings. Used in aviation fuels and petroleum and other chemicals. Sydney Water uses rubber ring joints for plastic pipes, not bonding agents.
			A	0.02	

disinfection by-products

Distribution system: As a minimum monitoring should be carried out for trihalomethanes. If concentrations exceed the guideline value, then other by-products should be analysed specifically. Monthly samples should be taken from each distribution system, with more samples if:

- the chlorine disinfection dose is increased substantially
- trihalomethane concentrations exceed the guideline value
- the source of supply is changed.

Drinking Water Quality –

Characteristics	ADWG 2011 recommendation		Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
	Location	Frequency			
chlorinated furanones	supply to consumer/ distribution system			none	By-product of Chlorination. Not for routine compliance monitoring as there is no guideline value.
chloroacetic acids	supply to consumer/ distribution system				By-product of Chlorination.
chloroacetic acid			H	0.15	
dichloroacetic acid			H	0.10	
trichloroacetic acid			H	0.10	
chloroketones	supply to consumer/ distribution system				By-product of Chlorination. Not for routine compliance monitoring as there is no guideline value.
1,1-dichloropropanone				none	
1,3- dichloropropanone				none	
1,1,1- trichloropropanone				none	
1,1,3- trichloropropanone				none	
chlorophenols	supply to consumer/ distribution system				By-product of Chlorination of water containing phenols.
2-chlorophenol			H	0.3	
			A	0.0001	
2,4-dichlorophenol			H	0.2	
			A	0.0003	
2,4,6-trichlorophenol			H	0.02	
			A	0.002	
chloropicrin	supply to consumer/ distribution system			None	By-product of Chlorination. Not for routine compliance monitoring as there is no guideline value.

Drinking Water Quality –

Characteristics	ADWG 2011 recommendation		Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
	Location	Frequency			
cyanogen chloride	supply to consumer/ distribution system		H	0.08	By-product of Chloramination
formaldehyde	supply to consumer/ distribution system		H	0.5	By-product of Ozonation
haloacetonitriles dichloroacetonitrile dichloroacetonitrile dichloroacetonitrile dichloroacetonitrile	supply to consumer/ distribution system			None None None None	By-product of Chlorination. Not for routine compliance monitoring as there is no guideline value.
trichloroacetaldehyde (chloral Hydrate)	supply to consumer/ distribution system		H	0.02	By-product of Chlorination Lab with NATA accredited method not identified.
trihalomethanes	distribution system & outlet of WFPs		H	0.25	By-product of Chlorination and Chloramination.
n-nitrosodimethylamine (NDMA)	distribution system & outlet of WFPs		H	0.0001	By-product of Chlorination and Chloramination.
pesticides	raw water	one sample per month from storage reservoir inlet or intake to distribution should be analysed for those pesticides previously detected in the source water, or where their likely use would indicate that they might be detected	H	various	The main risks for pesticides are agricultural and domestic use in catchment areas and spills. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond.

Drinking Water Quality –
ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
		sampling for some pesticides is required 5-yearly, 3-yearly, or annually, based on agreement with NSW Health.			
radiological characteristics					
gross alpha	raw water	radiological quality should be assessed when a new supply is brought into service, and then every two years for ground water supplies, and every 5 years for surface water supplies.	H	0.5 Bq/L	Primary risk is from natural sources in catchments. Raw water monitoring is responsibility of SCA for other systems, except for North Richmond.
gross beta			H	0.5 Bq/L	No specific guideline values are set for beta- or gamma-emitting radionuclides. Specific beta- or gamma-emitting radionuclides should be identified and determined only if gross beta radioactivity (after subtracting the contribution of potassium-40) exceeds 0.5 Bq/L (27.6 Bq of beta activity per gram of stable potassium). It should never be regarded as a guideline value, or even as an indicative water quality target.
micro-organisms - Protozoa					
<i>Cryptosporidium</i>	N/A	N/A		N/A	
<i>Giardia</i>	N/A	N/A		N/A	

Drinking Water Quality –

ADWG 2011 recommendation

Characteristics	Location	Frequency	Health/aesthetic characteristic	Guideline value (mg/L unless otherwise noted)	Key Risk Area / Comments
micro-organisms – cyanobacteria and their toxins					
Microcystins	NA	NA	H	1.3 µg/L	There are also alert/notification levels based on cell count and biovolume of a specific group of potentially toxic cyanobacteria.
Cylindrospermopsin	NA	NA	Alert level	1 µg/L	
Nodularin	NA	NA	Alert level	1.3 µg/L	
Saxitoxins	NA	NA	Alert level	3 µg/L	

Glossary

ADWG	Australian Drinking Water Guidelines
AGWR	Australian Guidelines for Water Recycling
Licence	Sydney Water Corporation Operating Licence 2010-2015