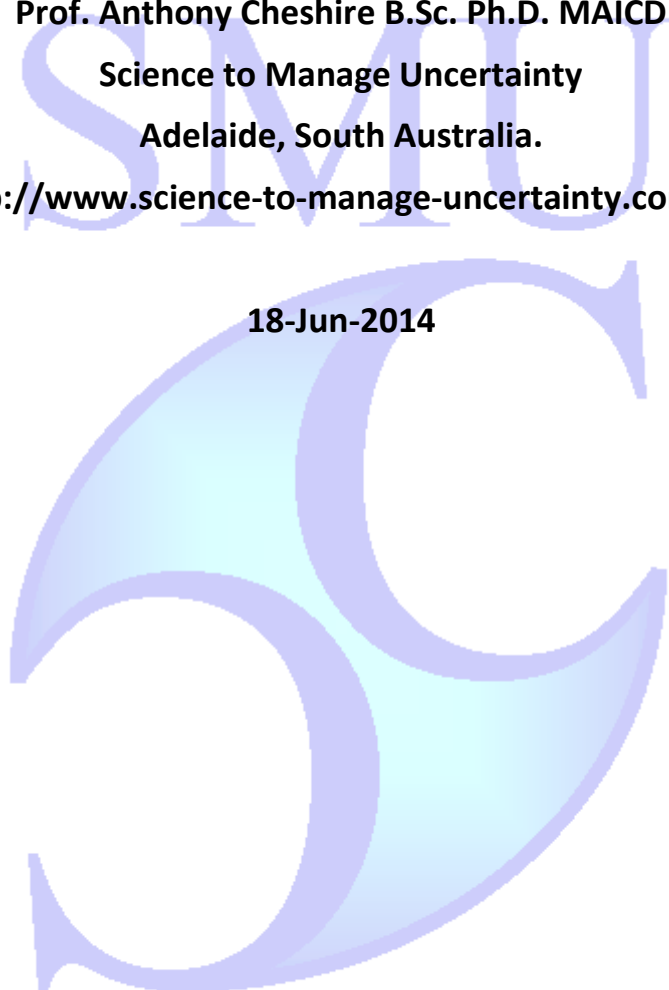


**Review of seawater character - intake volume monitoring licence
conditions for the Adelaide Desalination Plant:
June 2014**

**Prepared for
AdelaideAqua Pty Ltd
Report number 10 in the series**

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EXECUTIVE SUMMARY

Purpose

This document represents a report on the extent to which monitoring of intake volumes from selected sites in the vicinity of Port Stanvac meets with the EPA Licence Conditions for the construction and operation of the Adelaide Desalination Plant (ADP) over the period February 2009 to 12-Dec-2013. The monitoring reports were associated with the construction (including commissioning) of the desalination plant (by AdelaideAqua D&C Consortium – AAD&C) from February 2009 to 12-Dec-2012 and to the operation of the desalination plant (AdelaideAqua Pty Ltd) from 12-Dec-2012 to 12-Dec-2013.

Background

AdelaideAqua Pty Ltd is the operator of the Adelaide Desalination Plant at Port Stanvac South Australia. Operation of the ADP requires the discharge of reject water to the marine environment; this activity was originally conducted under a licence issued to AAD&C by the Environment Protection Authority of South Australia (EPA Licence Number 26902) and subsequently under another licence issued to AAPL (EPA Licence Number 39143). These licences authorised AAD&C and AAPL to undertake a series of activities of environmental significance under Schedule 1 Part A of the Environment Protection Act 1993 (the Act). The licences had specific requirements in relation to “Discharges to Marine Waters” that are the subject of this report.

Section 14 (305-626) of the licence requires that the licensee must ensure that:

1. An independent review of all marine monitoring is conducted by independent specialist(s) as approved in writing by the EPA prior to the review commencing;
2. All marine monitoring from the period commencing with the issue of the licence and ending 12 months after project handover of the 100 GL desalination plant is included in the review; and
3. The full results of the review are provided to the EPA not more than 18 months after project handover of the 100 GL desalination plant.

The EPA has also advised that prior to appointment, the independent reviewer must be able to demonstrate to the EPA that:

1. They will use their own professional judgment;
2. They will take appropriate specialised advice when the issue is outside their expertise;
3. Their opinions will be reached independently;
4. In forming opinions, they will not be unduly influenced by the views or actions of others who may have an interest in the outcome of the review; and
5. They must declare any real or apparent conflict of interest.

With the approval of the EPA, Anthony Cheshire (the author of this report) was selected by AdelaideAqua Pty Ltd (AAPL) to undertake this review.

Approach

This review of seawater character - intake volume monitoring encompassed a study of all documentation provided by AdelaideAqua Pty Ltd which comprised a series of 30 monitoring reports each of which was produced by staff at AAD&C, AAPL or by experts contracted by the parties for that purpose.

Each report has been critically reviewed and key issues that pertain to compliance with the licence conditions have been aggregated into a summary that has been presented in this report.

Specific requirements

To consider the work done against the Scheduled Marine Monitoring Requirements detailed in Attachment A to Licences 26902 and 39143. These being:

EPA Licence 26902: Daily volume of seawater intake in ML.

EPA Licence 39143: Daily volume of seawater intake in ML.

General requirements

In addition the EPA require that the Independent Reviewer is to undertake a technical review of all marine monitoring results from the commencement date of the Licence 26902 (D&C) until 12 December 2013 (12 months after plant handover) in order to assess the environmental impact of the desalination plant. This matter will be addressed in a subsequent report.

Conclusion

The specific requirement for this condition was to make daily measurements of intake volumes.

Overall data coverage (i.e. the number of daily records as a percentage of those expected based number of days per month) was complete (100%) across all months over the thirty month period 01-Jul-2011 to 31-Dec-2013.

LICENCE CONDITION: SEAWATER CHARACTER - INTAKE VOLUME MONITORING

In the following the specific requirements pertaining to the licence condition (seawater character - intake volume) are summarised along with information about the documents that have been reviewed.

Documents reviewed for this licence condition:

Document Name	Reference
EPA_July_MM_Condition 10 verified.xlsx	AdelaideAqua, (2011). Daily volume of seawater intake for July 2011. AdelaideAqua Pty Ltd.
EPA_August_MM_Condition 10 verified.xlsx	AdelaideAqua, (2011). Daily volume of seawater intake for August 2011. AdelaideAqua Pty Ltd.
EPA_September_MM_Condition 10 verified.xlsx	AdelaideAqua, (2011). Daily volume of seawater intake for September 2011. AdelaideAqua Pty Ltd.
EPA_OCTOBER_MM_Condition 10 verified.xlsx	AdelaideAqua, (2011). Daily volume of seawater intake for October 2011. AdelaideAqua Pty Ltd.
EPA_November_MM_Condition 10 verified.xlsx	AdelaideAqua, (2011). Daily volume of seawater intake for November 2011. AdelaideAqua Pty Ltd.
EPA_December_MM_condition 10.xlsm	AdelaideAqua, (2011). Daily volume of seawater intake for December 2011. AdelaideAqua Pty Ltd.
2012_1 EPA_January_intake_flow_10.xlsx	AdelaideAqua, (2012). Daily volume of seawater intake for January 2012. AdelaideAqua Pty Ltd.
2012_2 EPA_February_intake_flow_10.xlsx	AdelaideAqua, (2012). Daily volume of seawater intake for February 2012. AdelaideAqua Pty Ltd.
2012_3 EPA_March_intake_flow_10.xlsx	AdelaideAqua, (2012). Daily volume of seawater intake for March 2012. AdelaideAqua Pty Ltd.
2012_4 APRIL EPA_INTAKE_FLOW_10.XLSX	AdelaideAqua, (2012). Daily volume of seawater intake for April 2012. AdelaideAqua Pty Ltd.
2012_5 MAY EPA_INTAKE_FLOW_10.XLSX	AdelaideAqua, (2012). Daily volume of seawater intake for May 2012. AdelaideAqua Pty Ltd.
2012_6 JUNE EPA_INTAKE_FLOW_10.XLSX	AdelaideAqua, (2012). Daily volume of seawater intake for June 2012. AdelaideAqua Pty Ltd.
2012_7 EPA_JULY_MM_CONDITON 10 inatke vol.XLSX	AdelaideAqua, (2012). Daily volume of seawater intake for July 2012. AdelaideAqua Pty Ltd.
2012_8 EPA_AUGUST_MM_CONDITON 10 VERIFIED inatke vol.XLSX	AdelaideAqua, (2012). Daily volume of seawater intake for August 2012. AdelaideAqua Pty Ltd.
2012_9 EPA_SEPTEMBER_CONDITON 10 intake vol.XLSX	AdelaideAqua, (2012). Daily volume of seawater intake for September 2012. AdelaideAqua Pty Ltd.
2012_10 EPA_October_c_10.xlsx	AdelaideAqua, (2012). Daily volume of seawater intake for October 2012. AdelaideAqua Pty Ltd.
2012_11 EPA_November_c_10.xlsx	AdelaideAqua, (2012). Daily volume of seawater intake for November 2012. AdelaideAqua Pty Ltd.
2012_12 EPA_December_c_10.xlsx	AdelaideAqua, (2012). Daily volume of seawater intake for December 2012. AdelaideAqua Pty Ltd.
2013_01 EPA_January_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for January 2013. AdelaideAqua Pty Ltd.
2013_02 EPA_February_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for February 2013. AdelaideAqua Pty Ltd.
2013_03 EPA_March_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for March 2013. AdelaideAqua Pty Ltd.
2013_04 EPA_April_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for April 2013. AdelaideAqua Pty Ltd.

Document Name	Reference
2013_05_EPA_May_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for May 2013. AdelaideAqua Pty Ltd.
2013_06_EPA_June_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for June 2013. AdelaideAqua Pty Ltd.
2013_07_EPA_July_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for July 2013. AdelaideAqua Pty Ltd.
2013_08_EPA_August_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for August 2013. AdelaideAqua Pty Ltd.
2013_09_EPA_September_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for September 2013. AdelaideAqua Pty Ltd.
2013_10_EPA_October_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for October 2013. AdelaideAqua Pty Ltd.
2013_11_EPA_November_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for November 2013. AdelaideAqua Pty Ltd.
2013_12_EPA_December_c_10.xlsx	AdelaideAqua, (2013). Daily volume of seawater intake for December 2013. AdelaideAqua Pty Ltd.

Specific requirement (see Attachment A – Marine Monitoring Schedule):

EPA Licence 26902: Daily volume of seawater intake in ML.

EPA Licence 39143: Daily volume of seawater intake in ML.

Overall summary in relation to seawater character - intake volume

Intake volumes were recorded using the in-line flow meters. During the initial period July 2011 to July 2012 the data source was not specified; subsequent metering was via flow meters 301-FIT-1501 (for SP1) and 301-FIT-2502 (for SP2).

For the purposes of this Licence condition the data have been validated against a series of reasonableness criteria and values that do not meet those criteria have been excluded. Percentage coverage has been determined based on the number of valid data records obtained as a percentage of the number of records expected based on the assumption that one data record would be required for intake volume on each day of operation (zero values are expected on days when either SP1 and/or SP2 were not operating).

Data has been recorded since July 2011 which includes the period of early phase testing (including first water runs; Appendix A) and through the major operational testing (SP1 and SP2 full production; Appendix A) leading to full production and commissioning.

No attempt has been made to interpret the data other than to report the coverage of the data records (noting that data were provided for review in a series of EXCEL files as detailed above).

Data provided represent daily measurements of the intake water volume over the period 1-Jul-2011 to 31-Dec-2013. Data coverage for this period is complete with data values provided for every day over the 30 month period (Table 1).

Table 1 – Condition 9 metals, nitrogen, phosphorus and suspended solids within intake water.

Year and Month	File	Days	Overall %	Unspecified stream or meter		SP1		SP2	
						301-FIT-1501		301-FIT-2502	
				Min (ML)	Max (ML)	Min (ML)	Max (ML)	Min (ML)	Max (ML)
2011-07	EPA_July_MM_Condition 10 verified.xlsx	31	100%	0.0	26.7				
2011-08	EPA_August_MM_Condition 10 verified.xlsx	31	100%	0.0	24.2				
2011-09	EPA_September_MM_Condition 10 verified.xlsx	31	100%	0.0	24.1				
2011-10	EPA_OCTOBER_MM_Condition 10 verified.xlsx	31	100%	0.0	65.9				
2011-11	EPA_November_MM_Condition 10 verified.xlsx	31	100%	0.0	66.8				
2011-12	EPA_December_MM_condition 10.xlsm	31	100%	0.0	0.0				
2012-01	2012_1 EPA_January_intake_flow_10	31	100%	0.0	64.0				
2012-02	2012_2 EPA_February_intake_flow_10	29	100%	0.0	101.7				
2012-03	2012_3 EPA_March_intake_flow_10	31	100%	0.0	290.2				
2012-04	2012_4_APRIL_EPA_INTAKE_FLOW_10	30	100%	0.0	27.4				
2012-05	2012_5_MAY_EPA_INTAKE_FLOW_10	31	100%	0.0	216.1				
2012-06	2012_6_JUNE_EPA_INTAKE_FLOW_10	30	100%	39.8	134.2				
2012-07	2012_7 EPA_JULY_MM_CONDITON 10 intake vol	31	100%	50.6	195.4				
2012-08	2012_8 EPA_AUGUST_MM_CONDITON 10 VERIFIED intake vol	31	100%			0.0	236.5	0.0	65.5
2012-09	2012_9_EPA_SEPTEMBER_CONDITON 10 intake vol	30	100%			-3.3	94.4	0.0	300.5
2012-10	2012_10_EPA_October_c_10	31	100%			0.0	268.4	0.0	334.1
2012-11	2012_11_EPA_November_c_10	30	100%			0.0	335.5	0.0	332.8
2012-12	2012_12_EPA_December_c_10	31	100%			0.0	198.6	0.0	165.7
2013-01	2013_01_EPA_January_c_10	31	100%			119.3	261.3	0.0	297.6
2013-02	2013_02_EPA_February_c_10	28	100%			129.3	216.1	24.6	322.4
2013-03	2013_03_EPA_March_c_10	31	100%			0.0	216.0	0.0	269.9
2013-04	2013_04_EPA_April_c_10	30	100%			0.0	192.9	0.0	201.0
2013-05	2013_05_EPA_May_c_10	31	100%			0.0	251.0	0.0	270.4
2013-06	2013_06_EPA_June_c_10	30	100%			0.0	324.7	0.0	332.4
2013-07	2013_07_EPA_July_c_10	31	100%			0.0	131.4	0.0	137.0
2013-08	2013_08_EPA_August_c_10	31	100%			0.0	193.5	0.0	163.6
2013-09	2013_09_EPA_September_c_10	30	100%			0.0	230.3	0.0	199.3
2013-10	2013_10_EPA_October_c_10	31	100%			5.5	328.2	11.2	332.3
2013-11	2013_11_EPA_November_c_10	30	100%			136.0	332.3	0.0	335.0
2013-12	2013_12_EPA_December_c_10	31	100%			0.0	328.5	85.8	297.5
Compliance performance (totals and other statistics)		917	100%						

Appendix A KEY DATES IN PLANT CONSTRUCTION AND OPERATION

The following provides a list of key dates in the construction and operation of the plant. This material provides background to the review and in particular places the analysis and interpretation of each of the monitoring reports into context with the activities that were occurring on-site in the period leading up to the monitoring event.

Date	Activity
01-Feb-2009	Construction activities commenced
16-Nov-2009	Maritime platform arrived on site
08-Jul-2010	Maritime platform completed operations
01-Jun-2011	First discharge and first intake of seawater
14-Oct-2011	First Water – plant production was (30 MLD)
21-Mar-2012	SP1 – Full production from first half the plant (150 MLD)
31-May-2012	SP2 – Full production from second half of the plant (150 MLD)
24-Oct-2012	Performance test – plant running at full production for 7 days (150 MLD)
07-Nov-2012	Performance test – plant running at full production for 7 days (150 MLD)
21-Nov-2012	Reliability test – continuous running at various production rates
12-Dec-2012	Plant handover from commissioning