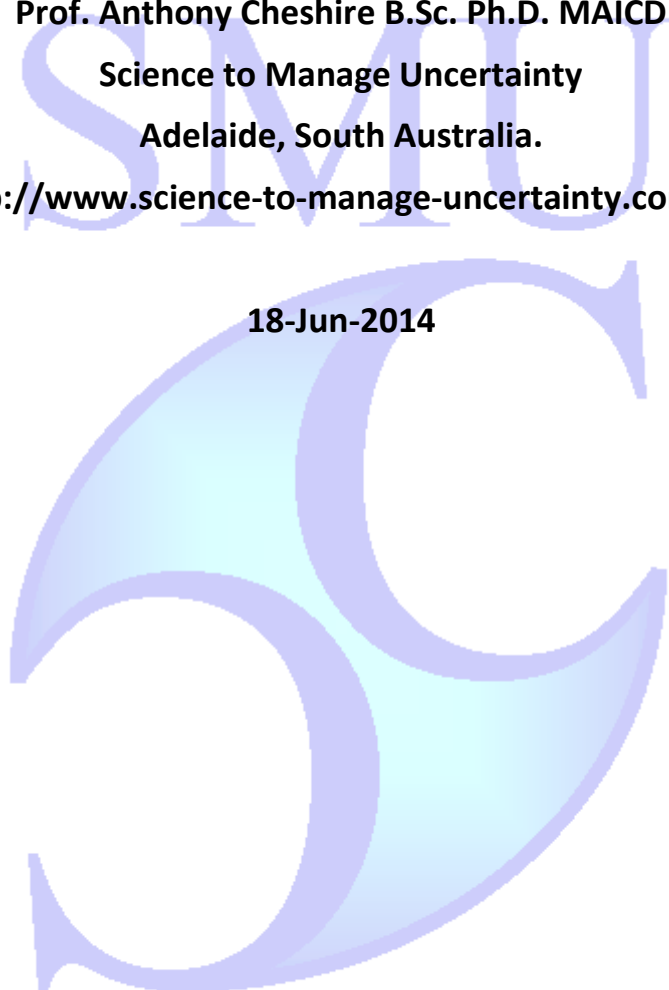


**Review of marine noise monitoring licence conditions for the  
Adelaide Desalination Plant:  
June 2014**

**Prepared for  
AdelaideAqua Pty Ltd  
Report number 19 in the series**

**By  
Prof. Anthony Cheshire B.Sc. Ph.D. MAICD  
Science to Manage Uncertainty  
Adelaide, South Australia.  
<http://www.science-to-manage-uncertainty.com.au>**

**18-Jun-2014**



## Document control

Title	Review of marine noise monitoring licence conditions for the Adelaide Desalination Plant
Revision	5
Author	Anthony Cheshire
Client	AdelaideAqua Pty Ltd
Date finalised	18-Jun-2014
Distribution	Vanesa Ayala
Version	Final version for publication

For citation purposes this document should be referred to as:

CHESHIRE, A.C. (2014). REVIEW OF MARINE NOISE MONITORING LICENCE CONDITIONS FOR THE ADELAIDE DESALINATION PLANT, JUNE 2014. REPORT 19 IN A SERIES PREPARED FOR ADELAIDEAQUA PTY LTD BY SCIENCE TO MANAGE UNCERTAINTY PP: 8.

## Table of contents

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
PURPOSE.....	1
BACKGROUND .....	1
APPROACH .....	2
<i>Specific requirements</i> .....	2
<i>General requirements</i> .....	2
CONCLUSION .....	2
<b>LICENCE CONDITION: MARINE NOISE MONITORING.....</b>	<b>3</b>
SPECIFIC REQUIREMENT (SEE ATTACHMENT A – MARINE MONITORING SCHEDULE):.....	3
OVERALL SUMMARY IN RELATION TO MARINE NOISE MONITORING .....	3
<b>APPENDIX A      KEY DATES IN PLANT CONSTRUCTION AND OPERATION .....</b>	<b>5</b>

## EXECUTIVE SUMMARY

### Purpose

This document represents a report on the extent to which monitoring of marine noise 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 marine noise monitoring encompassed a study of all documentation provided by AdelaideAqua Pty Ltd which comprised a series of 2 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 (1-Dec-2010 through 31-Dec-2012): Noise surveys from the operating plant to confirm that noise from intake pumps or other equipment is not detectable.

EPA Licence 39143: No requirement for monitoring in relation to marine noise.

### *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 objective of the monitoring was to make an assessment of underwater noise during a 5 day period when the plant was operating and to compare this to a period when the plant was not operating. A series of measurements of the underwater noise levels were obtained and plotted over time along with data on the intake and outfall flow rates (a measure of plant operation level). An assessment criterion for the monitoring was set at a Sound Pressure Level (SPL) of 120 dB re 1  $\mu$ Pa and all exceedances were identified and discussed. None of the exceedances could be linked to the operation of the plant.

## LICENCE CONDITION: MARINE NOISE MONITORING

In the following the specific requirements pertaining to the licence condition (marine noise) are summarised along with information about the documents that have been reviewed.

Documents reviewed for this licence condition:

Document Name	Reference
13 Underwater Noise & Vibration Assessment.pdf	Connell Wagner, (2008). Adelaide Desalination Project Technical Studies & Investigations: Technical Report - Underwater Noise & Vibration. Connell Wagner Pty Ltd.
AAPL Underwater Noise Report 2012-12-18 TEv.pdf	Evans, T., (2012). Adelaide Desalination Plant Operational Underwater Noise Monitoring. Resonate Acoustics.

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

EPA Licence 26902 (1-Dec-2010 through 31-Dec-2012): Noise surveys from the operating plant to confirm that noise from intake pumps or other equipment is not detectable.

EPA Licence 39143: No requirement for monitoring in relation to marine noise.

### Overall summary in relation to marine noise monitoring

The EPA licence indicates that there is a need for “Noise surveys of the operating plant to confirm that noise from intake pumps or other equipment is not detectable”. No advice is given about the timing of this monitoring, the timeframes over which it should occur or the spatial scale of sampling; there is therefore, no explicit basis for quantifying what is meant by “not detectable”.

The AAPL marine monitoring guidelines for the ADP state that the aim was to undertake a study over a 5 day period including some time while the plant was not operating.

The objective of the monitoring was to make an assessment of underwater noise during a period when the plant was operating and to compare this to a period when the plant was not operating. To achieve this an underwater noise logger was located between the outfall diffusers and the intake structure for a continuous period of five days, this was undertaken over a period when the plant was initially operating at close to full capacity (around 240-270 MLD) and extended into a period when the plant was not operating; this provided the basis for a comparison of underwater noise levels when the plant was operating with ambient underwater noise levels.

The noise level monitor was set to record for a 15 second period every 15 minutes. The plant was running over the first 3 days of the deployment, it operated intermittently on the first half of day 4 and was not operating for the remainder of the period. This allowed a measurement of the underwater noise both while the plant was operating and when it was not.

The data obtained were plotted over time along with data on the intake and outfall flow rates (a measure of plant operation level). An assessment criterion for the monitoring was set at a Sound Pressure Level (SPL) of 120 dB re 1  $\mu$ Pa (based on the work done by Connell Wagner (2008)) and all exceedances were identified and discussed. None of the exceedances could be linked to the operation of the plant.

## 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.

<b>Date</b>	<b>Activity</b>
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