



## Public Report

Q-4120-15-RP-003

# Talinga Water Treatment Facility Water Quality Discharge Annual Report

(1 July 2010 to 30 June 2011)

<b>Version:</b>	Rev 0
<b>Released:</b>	15/12/2011
<b>Document Owner:</b>	Manager – Land, Stakeholder and Environment
<b>Review Date:</b>	N/A

\*Please see Document control section for more information

Once printed, this is an uncontrolled document  
unless issued and stamped Controlled Copy.

## Contents

<b>1. Summary</b>	<b>3</b>
<b>2. Introduction</b>	<b>3</b>
<b>3. Talinga Water Treatment Facility Scheme Description</b>	<b>5</b>
3.1. Feed pond	5
3.2. Filtration	6
3.3. Reverse osmosis	6
3.4. Treated CSG water conditioning	6
<b>4. Approvals, Monitoring and Results</b>	<b>6</b>
4.1. Approvals	6
4.2. External laboratory monitoring	6
4.3. TWTF online indicator monitoring	7
<b>5. Operational Performance</b>	<b>7</b>
5.1. Review of operations	7
5.2. Audits completed	7
5.3. Data summary	8
5.4. N-Nitrosodimethylamine	9
<b>Abbreviations and Acronyms</b>	<b>10</b>
<b>Document Control</b>	<b>11</b>

## 1. Summary

Australia Pacific LNG is a joint venture between Origin, ConocoPhillips and Sinopec, to deliver a coal seam gas (CSG) to Liquefied Natural Gas (LNG) project which will deliver gas to domestic and overseas markets.

Australia Pacific LNG is the leading CSG producer in Queensland, supplying more than 40% of the State's domestic gas requirements.

The Talinga Water Treatment Facility (TWTF) has been designed using the best available technology to treat water produced as part of the gas extraction process so that it can be put to a number of beneficial uses such as construction water use and on-site use. Treated CSG water is also discharged to the Condamine River, which is a source of public drinking water.

This is the first Annual Report regarding the TWTF water quality discharge. It presents a summary of the TWTF's overall performance since commencing discharge of treated CSG water to the Condamine River on the 21 September 2010 to the 30 June 2011 (the reporting period). The performance details summarised in this report indicate that the TWTF consistently and reliably treats CSG water to a standard which is safe for discharge into a source of public drinking water.

## 2. Introduction

CSG production relies on the removal of water from the coal seams allowing gas to flow so that it can be readily extracted. The removed water is referred to as CSG water.

CSG water is brackish and alkaline in nature and therefore has very few applications for use. However, after treatment through a desalination process, CSG water can be put to effective and beneficial use.

The TWTF is one of Australia Pacific LNG's major installations where CSG water is treated. The TWTF uses the best available technologies to treat the water to a high standard.

Once treated, the CSG water is used onsite for Australia Pacific LNG's business activities including for drinking and domestic purposes, operations process water and construction activities. This reduces Australia Pacific LNG's reliance on other water resources.

The treated CSG water is also discharged to the Condamine River where it contributes to the base flows. The Condamine River is an essential resource to local communities and landowners in the region. It is the principal drinking water supply for the Condamine Township (located approximately forty seven river kilometres downstream of the TWTF discharge location) as well being used for agricultural irrigation and to support local industries. Protecting its existing quality and condition is therefore vital to ensure its long term sustainable use.



**Figure 1 - TWTF Discharge Location**

To ensure the safety and reliability of the treated CSG water entering the River, Australia Pacific LNG is engaged in a comprehensive ongoing monitoring program of water quality sampling, testing and reporting. This Annual Report presents a summary of the overall performance of the TWTF for the reporting period and is based on the quarterly reports previously published for the TWTF. These reports can be found on the Australia Pacific LNG website at: [www.aplng.com.au/newsroom/publications](http://www.aplng.com.au/newsroom/publications).

This is the first Annual Report on the TWTF's performance. Annual as well as quarterly reporting will continue throughout the TWTF's operational life while it is discharging water into a source of drinking water.

In presenting this information Australia Pacific LNG honours its commitment to providing transparency and ensuring the community, landowners and other key stakeholders have confidence that the treated CSG water can be safely discharged into a source of drinking water.

All the reporting is publically available and can be viewed and downloaded from the Australia Pacific LNG website at [www.aplng.com.au](http://www.aplng.com.au). Any enquiries relating to this report should be made to toll free number 1800 526 369.

Alternatively, general enquires can be made by email ([contact@aplng.com.au](mailto:contact@aplng.com.au)) or mail to Australia Pacific LNG Pty Limited, GPO Box 148, Brisbane, QLD, 4001.

### 3. Talinga Water Treatment Facility Scheme Description

The TWTF uses a series of water screening, filtration and desalination processes to remove impurities from the CSG water to ensure its safety and reliability for supply into a drinking water source and beneficial uses. The key treatment processes include:

- Feed pond;
- Filtration;
- Reverse osmosis; and
- Treated CSG water conditioning.

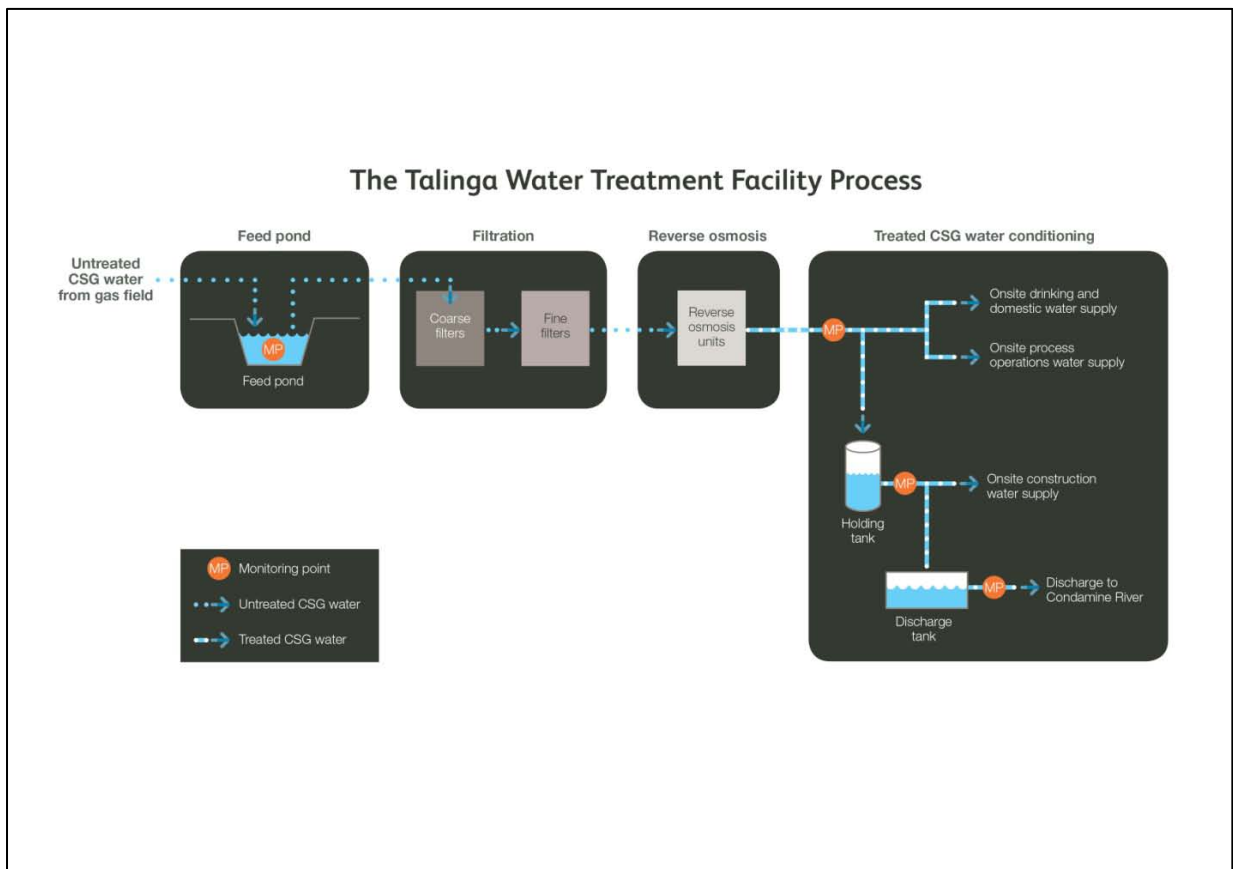


Figure 2 - TWTF Process Schematic

#### 3.1. Feed pond

Untreated CSG water gathered from the gas field is temporarily stored in a feed pond prior to its treatment by the TWTF. The feed pond holds the CSG water for approximately one to two weeks. This allows the settlement of coarse suspended sediments and provides opportunity for the CSG water to aerate and oxygenate.

### 3.2. Filtration

The CSG water is then passed through a coarse filter and then a fine filter to remove any particles or suspended sediments that have not settled within the feed pond. A disinfectant commonly used in domestic water treatment facilities is also added prior to the filtration process to protect the treatment system and membranes used in the following reverse osmosis process.

### 3.3. Reverse osmosis

Reverse osmosis involves passing the CSG water through fine membranes at high pressure. This removes most of the dissolved salts and other trace elements.

At this point the water is either transferred to a holding tank, where it is held prior to discharge or piped for use onsite.

### 3.4. Treated CSG water conditioning

Prior to entering the holding tank, the pH of the treated CSG water is adjusted to ensure its suitability for use and the disinfectant added during the filtration process is removed.

Where the treated CSG water is discharged to the Condamine River calcium and magnesium salts are added. This conditioning is undertaken to ensure a minimum level of these elements is present in the Condamine River to protect the environment. These natural salts are normally present at much higher concentrations in river waters and municipal drinking water supplies.

## 4. Approvals, Monitoring and Results

### 4.1. Approvals

In order to discharge to the Condamine River, Australia Pacific LNG gained approval from the Queensland Government's Department of Environment and Resource Management (DERM). This involved undertaking intensive and comprehensive quality and performance monitoring of the TWTF process.

The monitoring also helped define and develop a targeted ongoing monitoring program that has been implemented for the TWTF.

### 4.2. External laboratory monitoring

The CSG water and treated CSG water is regularly sampled and sent to an independent laboratory for testing. The sampling takes place at three monitoring locations:

- At the feed pond;
- On exit from the holding tank; and
- Within the discharge tank prior to the release of the treated CSG water to the Condamine River.

# Talinga Water Treatment Facility Water Quality Discharge Annual Report (1 July 2010 to 30 June 2011)



The samples are tested for a comprehensive range of parameters. The results from this monitoring have been previously published in quarterly reports available on the Australia Pacific LNG website: [www.aplng.com.au/newsroom/publications](http://www.aplng.com.au/newsroom/publications).

This water quality monitoring is undertaken using an industry-wide protocol developed by Standards Australia and DERM. Following these standards ensures the water samples are correctly obtained, stored and transported to allow accurate and representative testing in the laboratory.

The water is tested at the Queensland Health Forensic and Scientific Services laboratory. This laboratory is independent to Australia Pacific LNG's operations and is National Association of Testing Authorities (NATA) accredited.

*"NATA is the authority that provides independent assurance of technical competence through a proven network of best practice industry experts for customers who require confidence in the delivery of their products and services"* – NATA website.

## 4.3. TWTF online indicator monitoring

The TWTF has a number of online monitoring probes located throughout the treatment process. These provide real-time data about water quality and assurance that the TWTF is within acceptable operating limits. The online monitoring looks at a number of fundamental indicator parameters including pH, turbidity, conductivity, dissolved oxygen and total chlorine.

It is not practical to continually test all of the parameters that are externally monitored; however the indicators checked by the online system provide a view of the performance of the facility. Should any of these indicators vary from their expected limits, the onsite use and discharge to the Condamine River is suspended immediately until further investigation and monitoring is undertaken and any required corrections made.

## 5. Operational Performance

### 5.1. Review of operations

In addition to the monitoring discussed above, a detailed study covering 280 parameters of the untreated and treated CSG water was undertaken prior to commencing discharge to the Condamine River in September 2010. The extensive data collected pre and post discharge indicates that the TWTF reliably treats CSG water to a standard that is safe to be discharged into a source of drinking water.

As highlighted in the published quarterly reports, Australia Pacific LNG has undertaken an internal review of the parameters and frequency of sampling for the ongoing monitoring plan. This review is currently being undertaken in consultation with DERM. The outcome of this review and any changes to the ongoing monitoring plan will be communicated in the relevant quarterly report and the 2011-2012 annual report.

### 5.2. Audits completed

No external audits were required within the reporting period. An external audit of the TWTF will be undertaken following approval of the full recycled water management plan which is currently under consideration by DERM. Any external audits undertaken will be in

Talinga Water Treatment Facility  
Water Quality Discharge Annual Report  
(1 July 2010 to 30 June 2011)



accordance with the *Water Supply (Safety and Reliability) Act 2008* and in consultation with DERM.

### 5.3. Data summary

The TWTF commenced discharge of treated CSG water to the Condamine River on the 21 September 2010. Of the 41 weeks for the reporting period, 25 samples of the treated CSG water were collected at the discharge tank.

Of the 16 other samples:

- Six were not collected as no discharge to the Condamine River was occurring.
- Eight were not collected due to wet weather preventing access to the discharge tank. Samples for these weeks were collected at the holding tank.
- Two were not collected due to regional flooding preventing access to the TWTF.

A summary of the monitoring data collected for the reporting period is provided in the previously published quarterly discharge water quality reports available on the Australia Pacific LNG website [www.aplng.com.au/newsroom/publications](http://www.aplng.com.au/newsroom/publications).

There were also 7 parameters that were not tested during the reporting period which were identified in the quarterly reports. These 7 parameters included Hydrazine, Chlorine dioxide, Iodine, Bromine, 4-Chlorophenol 2, 2 Dichloropropionic Acid (DPA) and Acrylamide (2-propenamide). These parameters are not expected to form part of the ongoing monitoring program. A summary of the data for these seven parameters for the reporting period is provided in Table 1.

**Table 1- Parameters not tested**

Parameter	Frequency of monitoring	Date parameter not monitored	Reason parameter not monitored	Action taken	Date notified to DERM
Hydrazine, Chlorine dioxide	Weekly	All dates	Cannot be tested under laboratory conditions	Not expected to remain in ongoing monitoring program	20/12/10
Iodine, Bromine	Weekly	All dates	Do not exist in water in this form	Not expected to remain in ongoing monitoring program	10/08/10
4-Chlorophenol	Weekly	All dates	No appropriate test method	Not expected to remain in ongoing monitoring program	20/12/10

Parameter	Frequency of monitoring	Date parameter not monitored	Reason parameter not monitored	Action taken	Date notified to DERM
2, 2 Dichloropropionic Acid (DPA)	Weekly	All dates	Not expected in TWTF process, miscommunication with laboratory	Not expected to remain in ongoing monitoring program	20/12/10
Acrylamide (2- propanamide)	Weekly	All dates	Not expected in TWTF process, miscommunication with laboratory	Not expected to remain in ongoing monitoring program	20/12/10

#### 5.4. N-Nitrosodimethylamine

N-Nitrosodimethylamine (NDMA) levels were detected to be above the discharge water quality limit on eight sampling occasions, with two occasions occurring when no discharge to the Condamine River was occurring (see Table 2).

NDMA is a by-product of the disinfection process and the water quality limit set for the TWTF discharge is 0.01 µg/L. NDMA levels were effectively resolved by substituting use of untreated for treated CSG water in the disinfectant production process. Since making this change in December 2010, NDMA levels have not been detected above the water quality limit.

DERM was satisfied with the action Australia Pacific LNG took in relation to NDMA on its discovery, its subsequent management and reporting.

**Table 2- Summary of NDMA reporting**

Monitoring Frequency	Water quality limit (µg/L)	Sample Date	Date received from laboratory	Date DERM notified	Cause	Actions taken
Weekly	0.01	22/09/10	8/10/10	10/10/10	Byproduct of disinfection process	Used treated CSG water instead of untreated CSG water in the disinfection production process. Since making this change in December 2010 no further elevated NDMA results have been received.
		6/10/10	14/10/10	14/10/10		
		20/10/10	26/10/10	28/10/10		
		27/10/10	4/11/10	5/11/10		
		18/11/10	26/11/10	29/11/10		
		1/12/10	7/12/10	8/12/10		

## Abbreviations and Acronyms

Term/Abbreviation/Acronym	Definition
Australia Pacific LNG	Australia Pacific LNG Pty Limited
CSG	Coal seam gas
DERM	Department of Environment and Resource Management
LNG	Liquefied natural gas
NATA	National Association of Testing Authorities
ND	Not detected
QLD	Queensland
TWTF	Talinga Water Treatment Facility
the Act	Water Supply (Safety and Reliability) Act 2008

This Report has been produced in accordance with the Queensland Government's *Public Reporting Guideline for Recycled Water Schemes* (DERM, 2011) and the *Water Supply (Safety and Reliability) Act 2008* (the Act). Australia Pacific LNG currently operates under an approved interim recycled water management plan in accordance with the Act.

## Document Control

<b>Author (To whom any changes are to be recommended)</b>			
<b>Position</b>		<b>Incumbent</b>	
Senior Environmental Advisor		K.L. Presley <i>for K.M. Karina MacKintosh</i>	
<b>Stakeholders and other contributors</b>			
<b>Position</b>		<b>Incumbent</b>	
<b>Reviewed by</b>			
<b>Position</b>		<b>Incumbent</b>	<b>Review date</b>
Chief Environmental Scientist		G. Bartrim <i>GB</i>	15/12/2011
<b>Approved by</b>			
<b>Position</b>		<b>Incumbent</b>	<b>Approval date</b>
Manager Environmental Approvals and Strategy		R. Uilly <i>RU</i>	15/12/2011
<b>History</b>			
<b>Date</b>	<b>Author</b>	<b>Version</b>	<b>Nature of change</b>
15/12/2011	K.L. Presley	0	Original issue
<b>Related documents</b>			
<b>Title</b>		<b>Review Date</b>	
<b>Review Requirements</b>			
Review not required.			
<b>Controlled document location</b>			
<b>Key Document (Refer definitions in Key Documents Directive to determine)</b>			
This document is not an Australia Pacific LNG Key Document			