Government of **Western Australia**
Department of **Environment Regulation**

Our Ref: L8553/2011/1
File no: 2011/004312
Officer: Fiona Esszig
Phone: 9182 2036
Fax: 9144 1118
Email: fiona.esszig@der.wa.gov.au

Mr Steve Jeffcote
Environmental Supervisor
BHP Billiton Petroleum Pty Ltd
GPO Box J668
PERTH WA 6842

Dear Mr Jeffcote

***ENVIRONMENTAL PROTECTION ACT 1986* – AMENDMENT TO LICENCE**

Licence: L8553/2011/1
Premises: Macedon Gas Plant

Further to my letter dated 13 March 2014, please find enclosed your amended *Environmental Protection Act 1986* licence.

If you have any questions or objections relating to the licence, please do not hesitate to contact the enquiries officer above on 9182 2036 for clarification or discussion of any grievances you have.

If you are concerned about, or object to any aspect of the amendment, you may lodge an appeal with the Minister for the Environment within 21 days from the date on which this licence is received. The Office of the Appeals Convenor can be contacted on 6467 5190 to find out the procedure and fee.

Members of the public may also appeal the amendments. The Appeals Registrar at the Office of the Appeals Convenor can be contacted after the closing date of appeals to check whether any appeals were received.

Yours sincerely

Ed Schuller
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Wednesday, 23 April 2014

enc: Amended Licence L8553/2011/1, EAR
copy to: Local Government Authority: Shire of Ashburton

TL0571 v2.0

Government of **Western Australia**
Department of **Environment Regulation**

Licence

Environmental Protection Act 1986, Part V

Licensee: BHP Billiton Petroleum Pty Ltd

Licence: L8553/2011/1

Registered office: Level 22, 45 Clarence St
SYDNEY NSW 2000

ACN: 006 918 832

Premises Address: Macedon Gas Project
Lot 500 on Deposited Plan 69197
TALANDJI WA 6710 as depicted in Schedule 1.

Issue Date: Friday, 3 February 2012

Commencement Date: Monday, 6 February 2012

Expiry Date: Sunday, 5 February 2017

Prescribed premises category
Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved premises production or design capacity
10	Oil or gas production from wells: premises, whether on land or offshore, on which crude oil, natural gas or condensate is extracted from below the surface of the land or the seabed, as the case requires, and is treated or separated to produce stabilised crude oil, purified natural gas or liquefied hydrocarbon gases	5,000 tonnes or more per year	1,730,000 tonnes per year
34	Oil or gas refining: premises on which crude oil, condensate or gas is refined or processed	Not applicable	1,730,000 tonnes per year

Conditions
This Licence is subject to the conditions set out in the attached pages.

.....
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

Introduction

This Introduction is not part of the Licence conditions.

DER's industry licensing role
The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to protect and conserve the state's environment on behalf of the people of Western Australia.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER works with the business owners, community, consultants, industry and other representatives to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitor and audit compliance with works approvals and licence conditions, take enforcement action as appropriate and develop and implement licensing and industry regulation policy.

Licence requirements
This licence is issued under Part V of the Act. Conditions contained with the licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link:
http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.

- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.

- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.

You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

Licence fees
If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

Ministerial conditions
If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for the Environment. You are required to comply with any conditions imposed by the Minister.

Premises Description and Licence Summary
BHP Billiton Petroleum Pty Ltd (BHPPET) operates the Macedon Gas Plant, located approximately 17km south of Onslow. This is a domestic gas project using the offshore Macedon gas field. Gas is transported via a subsea pipeline to the Macedon Gas Plant, where it is treated and subsequently exported through a sales gas pipeline to an injection point on the Dampier to Bunbury Natural Gas Pipeline. Construction of the Macedon Gas Plant was approved under works approval W4865/2011/1.

Air emissions associated with the operation of the sales gas and power generation turbines are the significant emissions from the gas plant.

Initially, to support the construction of the gas plant, BHPPET developed a worker accommodation camp for 300-350 people and a wastewater treatment plant (WWTP) sized to treat a maximum of 146 cubic metres (m^3) per day of sewage. Treated effluent was disposed of via spray irrigation to an area approximately 3.6 hectares (ha) in size located south west of the camp. The WWTP was approved under works approval application W4841/2010/1. This WWTP has since been transferred to Bechtel for use as part of the Wheatstone Project.

Operating licence L8553/2011/1 was amended in February 2014 to include Category 10 and 34. A further amendment will be required when the operation of the wet gas turbines commence, in order to include the additional emission and monitoring points.

The licences and works approvals issued for the Premises since 1 January 2011 are:

Instrument Log		
Instrument	**Issued**	**Description**
W4841/2010/1	17/02/2011	New application – Category 54
L8553/2011/1	19/01/2012	New application
W4865/2011/1	21/07/2011	New application – Category 10
L8553/2011/1	20/2/2014	Amended to include Category 10 and 34
L8553/2011/1	17/4/2014	Amended to remove category 54 as the WWTP has been transferred to Bechtel for use in the Wheatstone Project

Severance
It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

END OF INTRODUCTION

Licence Conditions

1 General

1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986;*

'annual period' means the inclusive period from 1 April until 31 March in the following year;

'APHA-AWWA-WEF' means American Public Health Association – American Water Works Association – Water Environment Federation;

'AS 1940' means the Australian Standard AS 1940 *The storage and handling of flammable and combustible liquids*

'AS/NZS 5667.1' means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples;*

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters;*

'averaging period' means the time over which a limit or target is measured or a monitoring result is obtained;

'CEMS' means continuous emissions monitoring system;

'CEMS Code' means the current version of the Continuous Emission Monitoring System (CEMS) Code for Stationary Source Air Emissions, Department of Environment & Conservation, Government of Western Australia;

'code of practice for the storage and handling of dangerous goods' means the document titled "Storage and handling of dangerous goods: Code of Practice" published by the Department of Mines and Petroleum, as amended from time to time;

'dangerous goods' has the meaning defined in the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007*;

'Director' means Director, Environmental Regulation Division of the Department of Environment Regulation for and on behalf of the Chief Executive Officer as delegated under section 20 of the Act;

'Director' for the purpose of correspondence means:

Regional Leader, North West Region
Department of Environment Regulation
PO Box 835
KARRATHA WA 6714
Telephone: (08) 9182 2000
Facsimile: (08) 9144 1118
Email: industryregpilbara@der.wa.gov.au;

'environmentally hazardous material' means material (either solid or liquid raw materials, materials in the process of manufacture, manufactured products, products used in the manufacturing process, by-products and waste) which if discharged into the environment from or within the premises may cause pollution or environmental harm. Note: Environmentally hazardous materials include dangerous goods where they are stored in quantities below placard quantities. The storage of dangerous goods above placard quantities is regulated by the Department of Mines and Petroleum;

'freeboard' means the distance between the maximum water surface elevations and the top of retaining banks or structures;

'fugitive emissions' means all emissions not arising from point sources identified in Sections 2.2, 2.3, 2.4 and 2.5;

'Licence" means this licence numbered L8553/2011/1 and issued under the Act;

'Licensee' means the person or organisation named as Licensee on page 1 of the Licence;

'NATA' means the National Association of Testing Authorities, Australia;

'NATA accredited' means the submission of a sample to a laboratory which is NATA accredited for the analysis specified at the time of the analysis;

'normal operating conditions' means any operation of a particular process (including abatement equipment) excluding start-up, shut-down and upset conditions, in relation to stack sampling or monitoring;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

'quarterly' means the 4 periods from 1 April to 30 June, 1 July to 30 September, 1 October to 31 December and in the following year, 1 January to 31 March;

'Schedule 1' means Schedule 1 of this Licence unless otherwise stated;

'Schedule 2' means Schedule 2 of this Licence unless otherwise stated;

'shut-down' means the period when plant or equipment is brought from normal operating conditions to inactivity;

'spot sample' means a discrete sample representative at the time and place at which the sample is taken;

'stack test' means a discrete set of samples taken over a representative period at normal operating conditions;

'start-up' means the period when plant or equipment is brought from inactivity to normal operating conditions;

'STP dry' means standard temperature and pressure (0^{o}Celsius and 101.325 kilopascals respectively), dry;

'USEPA' means United States (of America) Environmental Protection Agency;

'USEPA Method 7E' means the promulgated Test Method 7E - Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure);
'USEPA Method 10' means the promulgated Test Method 10 – Determination of Carbon Monoxide Emissions from Stationary Sources (Instrumental Analyzer Procedure);

'USEPA Method 25A' means the promulgated Test Method 25A – Determination of Total Gaseous Organic Concentration using a Flame Ionization Analyzer;

'µS/cm' means microsiemens per centimetre; and

'usual working day' means 0800 – 1700 hours, Monday to Friday excluding public holidays in Western Australia.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.2 General conditions

1.2.1 Nothing in the Licence shall be taken to authorise any emission that is not mentioned in the licence, where the emission amounts to:
(a) pollution;
(b) unreasonable emission;
(c) discharge of waste in circumstances likely to cause pollution; or
(d) being contrary to any written law.

1.2.2 The Licensee shall maintain all pollution control and monitoring equipment to the manufacturer's specification or any relevant and effective internal management system.

1.2.3 The Licensee, except where storage is prescribed in section 1.3, shall ensure that environmentally hazardous materials are stored in accordance with the code of practice for the storage and handling of dangerous goods.

1.2.4 The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.

1.2.5 The Licensee shall:
(a) implement all practical measures to prevent stormwater run-off becoming contaminated by the activities on the Premises; and
(b) treat contaminated or potentially contaminated stormwater as necessary prior to being discharged from the Premises.[1]

Note1: The *Environmental Protection (Unauthorised Discharges) Regulations 2004* make it an offence to discharge certain materials into the environment.

1.3 Premises Operation

1.3.1 The Licensee shall ensure that process water is only discharged into evaporation ponds as per the specifications in Table 1.3.1.

Table 1.3.1: Containment infrastructure

Containment Cell and map reference	Material	Infrastructure requirements
Evaporation ponds 1 and 2 (E1)	Treated produced formation water, water of condensation and treated hydrocarbon contaminated water from the oily water separator	Evaporation ponds lined with HDPE liner to achieve a permeability of at least 10^{-9} m/s and a minimum top of embankment freeboard of 300 millimetres

2 Emissions

2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any limit or target specified in any part of section 2 of this section.

2.2 Point source emissions to air

2.1.2 The Licensee shall ensure that where waste is emitted to air from the emission points in Table 2.2.1 it is done so in accordance with the conditions of this licence.

Table 2.2.1: Emission points to air

Emission point reference	Emission point reference on Map of emission points in Schedule 1	Emission Point Source, including any abatement	Emission point height (m)
A1	110	Sales gas compressor stacks using SoLoNOx technology	15
A2	111	Sales gas compressor stacks using SoLoNOx technology	15
A3	112	Sales gas compressor stacks using SoLoNOx technology	15
A4	701	Power generator turbine stack	7
A5	702	Power generator turbine stack	7
A6	702	Power generator turbine stack	7
A7	704	Power generator turbine stack	7
A8	152 (HP)	High pressure multipoint flare (ground level flare)	2.4
A9	152 (LP)	Low pressure multipoint flare (ground level flare)	3.0

2.1.3 The Licensee shall not cause or allow point source emissions to air greater than the limits listed in Table 2.2.2.

Table 2.2.2: Point source emission limits to air

Emission point Reference	Parameter	Limit (including units)[1, 2, 3]	Averaging period
A1 – A3	Oxides of nitrogen	60 mg/m^3	Stack test (60 minute average)
A4 – A7	Oxides of nitrogen	246 mg/m^3	Stack test (60 minute average)

Note 1: All units are referenced to STP dry
Note 2: All units are referenced to 15% O_2
Note 3: Excludes start up and shut down conditions

2.3 Point source emissions to surface water

There are no specified conditions relating to point source emissions to surface water in this section.

2.4 Point source emissions to groundwater

There are no specified conditions relating to point source emissions to groundwater in this section.

2.5 Emissions to land

There are no specified conditions relating to emissions to land in this section.

2.6 Fugitive emissions

There are no specified conditions relating to fugitive emissions in this section.

2.7 Odour

2.7.1 The Licensee shall ensure that odour emitted from the Premises does not unreasonably interfere with the health, welfare, convenience, comfort or amenity of any person who is not on the Premises.

2.8 Noise

There are no specified conditions relating to emissions to noise in this section.

3 Monitoring

3.1 General monitoring

3.1.1 The licensee shall ensure that:
(a) all water samples are collected in accordance with AS/NZS 5667.1;
(b) all laboratory samples are submitted to and analysed by a laboratory with current NATA accreditation for the parameters to be measured; and
(c) all water samples are analysed in accordance with "Standard Methods for Examination of Water and Wastewater APHA-AWWA-WEF".

3.1.2 The Licensee shall ensure that:
(a) quarterly monitoring is undertaken at least 45 days apart; and
(b) annual monitoring is undertaken at least 9 months apart.

3.1.3 The Licensee shall record production or throughput data and any other process parameters relevant to any non-continuous or CEMS monitoring undertaken.

3.1.4 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.5 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the Director accompanied with a report comprising details of any modifications to the methods.

3.2 Monitoring of point source emissions to air

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

Table 3.2.1: Monitoring of point source emissions to air

Emission point reference	Parameter	Units [1, 3]	Averaging period	Frequency [2]	Method
A1 – A7	Nitrogen Oxides	g/s and mg/m^3	60 minute average	Annually	USEPA Method 7E
	Carbon monoxide	g/s and mg/m^3	60 minute average	Annually	USEPA Method 10
	Volatile organic compounds	g/s and mg/m^3	60 minute average	Annually	USEPA Method 25A
A8 – A9	Cumulative volume	cubic metres	Annual	Continuous	National Greenhouse and Energy Reporting (Measurement) Determination 2008

Note 1: All units are referenced to STP dry
Note 2: Monitoring shall be undertaken to reflect normal operating conditions and any limits or conditions on inputs or production.
Note 3: Concentration units are referenced to 15% O_2.

3.2.2 The Licensee shall ensure that sampling required under Condition 3.2.1 of the Licence is undertaken at sampling locations in compliance with the AS 4323.1 or relevant part of the CEMS Code.

3.2.3 The Licensee shall ensure that all non-continuous sampling and analysis undertaken pursuant to condition 3.2.1 is undertaken by a holder of NATA accreditation for the relevant methods of sampling and analysis.

3.3 Monitoring of point source emissions to surface water

There are no specified conditions relating to monitoring of emissions to groundwater in this section.

3.4 Monitoring of point source emissions to groundwater

There are no specified conditions relating to monitoring of emissions to groundwater in this section.

3.5 Monitoring of emissions to land

There are no specified conditions relating to monitoring of emissions to land in this section.

3.6 Monitoring of inputs and outputs

There are no specified conditions relating to monitoring of inputs and outputs in this section.

3.7 Process monitoring

There are no specified conditions relating to process monitoring in this section.

3.8 Ambient environmental quality monitoring

3.8.1 The Licensee shall undertake the monitoring in Table 3.8.1 according to the specifications in that table.

Table 3.8.1: Monitoring of ambient groundwater quality

Monitoring point reference and location as shown on map in schedule 1	Parameter	Units	Averaging period	Frequency
MB1 & MB2	Standing water level	m below ground level	Spot sample	Annual
	pH			
	Electrical conductivity	µS/cm		
	Total Petroleum Hydrocarbons	mg/L		
	Benzene	mg/L		
	Toluene	mg/L		
	Ethylbenzene	mg/L		
	Xylene	mg/L		
	Mercury	mg/L		
	Lead	mg/L		
	Arsenic	mg/L		
	Copper	mg/L		
	Nickel	mg/L		
	Cadmium	mg/L		
	Chromium	mg/L		

3.9 Meteorological monitoring

There are no specified conditions relating to meteorological monitoring.

4 Improvements

4.1 Improvement Programme

There are no specified improvement conditions in this section.

5 Information

5.1 Records

5.1.1 All information and records required by the Licence shall:
- (a) be legible;
- (b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
- (c) except for records listed in 5.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
- (d) for those following records, be retained until the expiry of the Licence or any subsequent licence:
  - (i) off-site environmental effects; or
  - (ii) matters which affect condition of the land or groundwater.

5.1.2 The Licensee shall ensure that:
- (a) any person left in charge of the Premises is aware of the conditions of the Licence and has access at all times to the Licence or copies thereof; and
- (b) any person who performs tasks on the Premises is informed of all of the conditions of the Licence that relate to the tasks which that person is performing.

5.1.3 The Licensee shall complete an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of the Licence, and any previous licence issued under Part V of the Act for the Premises for the previous annual period.

5.1.4 The Licence shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

5.2 Reporting

5.2.1 The Licensee shall submit to the Director at the Contact Address an Annual Environmental Report within 28 calendar days after of the end of the annual period. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

Table 5.2.1: Annual Environmental Report

Condition or Table (if relevant)	Parameter	Format or Form[1]
-	Summary of any failure or malfunction of any pollution control equipment or any incidents that have occurred during the annual period and any action taken	None specified
Table 2.2.2	Limit exceedances	N1
Table 3.2.1	Emissions to air	AR1
Table 3.2.1	Greenhouse gas emissions	None specified

Table 3.8.1	Groundwater monitoring	GR1
5.1.3	Compliance	AACR
5.1.4	Complaints summary	None specified

Note 1: Forms are in Schedule 2

5.2.2 The annual environmental report shall also contain:

(a) any relevant process, production or operational data recorded under Condition 3.1.3;

(b) an assessment of the information contained within the report against previous monitoring results and Licence limits and/or targets; and

(c) a list of any original monitoring reports submitted to the Licensee from third parties in the reporting period and make these reports available on request.

5.3 Notification

5.3.1 The Licensee shall ensure that the parameters listed in Table 5.3.1 are notified to the Director at the Contact Address and in accordance with the notification requirements of the table.

Table 5.3.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
	Any failure or malfunction of any pollution control equipment or any incident which has caused, is causing or may cause pollution		

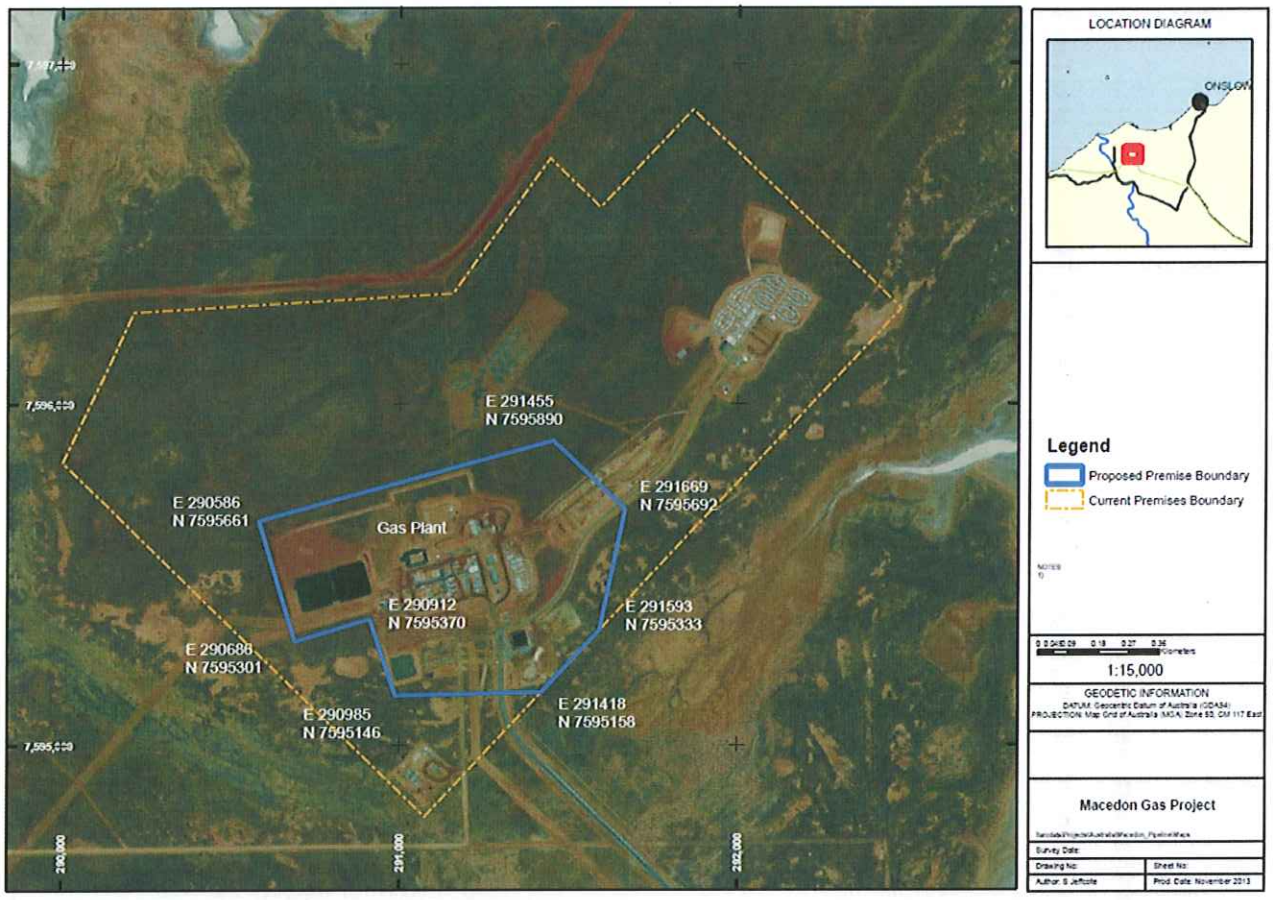
Note 1: Notification requirement in the Licence shall not negate the requirement to comply with s72 of the Act.

Note 2: Forms are in Schedule 2

Schedule 1: Maps

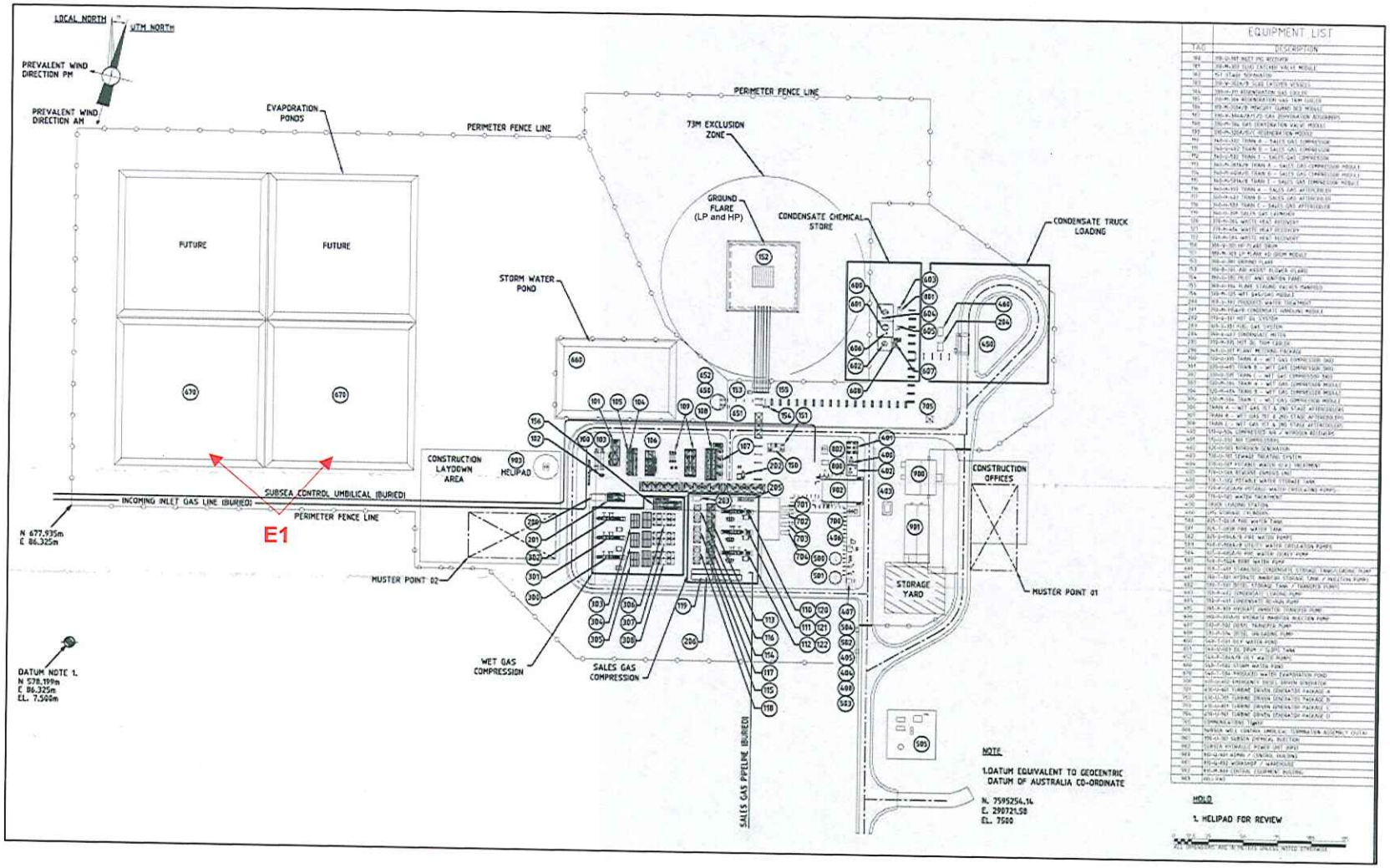
Premises Map

The Premises is shown in the map below. The blue line depicts the Premises boundary.



Maps of containment infrastructure, emissions points and monitoring locations

The locations of the containment infrastructure, emission points and monitoring locations defined in Table 1.3.1, Table 2.2.1, and Table 3.2.1 are shown below.



The location of the monitoring points defined in Table 3.8.1 are shown below.

Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

ANNUAL AUDIT COMPLIANCE REPORT PROFORMA

SECTION A

LICENCE DETAILS

Licence Number:	Licence File Number:
Company Name: Trading as:	ABN:
Reporting period: _____ to _____	

STATEMENT OF COMPLIANCE WITH LICENCE CONDITIONS

1. Were all conditions of the Licence complied with within the reporting period? (please tick the appropriate box)

Yes ☐ Please proceed to Section C

No ☐ Please proceed to Section B

Each page must be initialled by the person(s) who signs Section C of this Annual Audit Compliance Report (AACR).

Initial:

SECTION B
DETAILS OF NON-COMPLIANCE WITH LICENCE CONDITION.

Please use a separate page for each Licence condition that was not complied with.

a) Licence condition not complied with:	
b) Date(s) when the non compliance occurred, if applicable:	
c) Was this non compliance reported to DER?:	
☐ Yes ☐ Reported to DER verbally Date _____ ☐ Reported to DER in writing Date _____	☐ No
d) Has DER taken, or finalised any action in relation to the non compliance?:	
e) Summary of particulars of the non compliance, and what was the environmental impact:	
f) If relevant, the precise location where the non compliance occurred (attach map or diagram):	
g) Cause of non compliance:	
h) Action taken, or that will be taken to mitigate any adverse effects of the non compliance:	
i) Action taken or that will be taken to prevent recurrence of the non compliance:	

Each page must be initialled by the person(s) who signs Section C of this AACR

Initial:

SECTION C

SIGNATURE AND CERTIFICATION

This Annual Audit Compliance Report (AACR) may only be signed by a person(s) with legal authority to sign it. The ways in which the AACR must be signed and certified, and the people who may sign the statement, are set out below.

Please tick the box next to the category that describes how this AACR is being signed. If you are uncertain about who is entitled to sign or which category to tick, please contact the licensing officer for your premises.

If the licence holder is		The Annual Audit Compliance Report must be signed and certified:
An individual	□	by the individual licence holder, or
	□	by a person approved in writing by the Chief Executive Officer of the Department of Environment Regulation to sign on the licensee's behalf.
A firm or other unincorporated company	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A corporation	□	by affixing the common seal of the licensee in accordance with the *Corporations Act 2001*; or
	□	by two directors of the licensee; or
	□	by a director and a company secretary of the licensee, or
	□	if the licensee is a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A public authority (other than a local government)	□	by the principal executive officer of the licensee; or
	□	by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
a local government	□	by the chief executive officer of the licensee; or
	□	by affixing the seal of the local government.

It is an offence under section 112 of the *Environmental Protection Act 1986* for a person to give information on this form that to their knowledge is false or misleading in a material particular. There is a maximum penalty of $50,000 for an individual or body corporate.

I/We declare that the information in this annual audit compliance report is correct and not false or misleading in a material particular.

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SEAL (if signing under seal)

Licence: L8553/2011/1
Form: AR1
Name: Monitoring of point source emissions to air

Licensee: BHP Billiton Petroleum Pty Ltd
Period:

Form AR1: Monitoring of point source emissions to air						
Emission point	**Parameter**	**Result (mg/m^3)[1]**	**Results (g/s)**	**Averaging period**	**Method**	**Sample date & times**
A1 & A7	Nitrogen oxides					
	Carbon monoxide					
	Volatile organic compounds					

Note 1: All units are referenced to STP dry and corrected to 15% O_2

Signed on behalf of BHP Billiton Petroleum Pty Ltd: ..... Date: .....

Licence: L8553/2011/1
Form: GR1
Name: Monitoring of groundwater

Licensee: BHP Billiton Petroleum Pty Ltd
Period:

Form GR1: Monitoring of groundwater						
Emission point	**Parameter**	**Result**	**Unit**	**Averaging period**	**Method**	**Sample date & times**
	pH			Spot Sample		
	Standing water level		mAHD			
	Electrical conductivity		µS/cm			
	Total Petroleum Hydrocarbons		mg/L			
	Benzene		mg/L			
	Toluene		mg/L			
	Ethylbenzene		mg/L			
	Xylene		mg/L			
	Mercury		mg/L			
	Lead		mg/L			
	Arsenic		mg/L			
	Copper		mg/L			
	Nickel		mg/L			
	Cadmium		mg/L			
	Chromium		mg/L			

Signed on behalf of BHP Billiton Petroleum Pty Ltd: ..... Date: .....

Licence: L8553/2011/1 Licensee: BHP Billiton Petroleum Pty Ltd
Form: N1 Date of breach:

Notification of detection of the breach of a limit or any failure or malfunction of any pollution control equipment or any incident which has caused, is causing or may cause pollution.

These pages outline the information that the operator must provide.
Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence Number	
Name of operator	
Location of Premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Notification requirements for any failure or malfunction of any pollution control equipment or any incident which has caused, is causing or may cause pollution	
Date and time of event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken , or intended to be taken, to stop any emission	
Description of the failure or accident	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of BHP Billiton Petroleum Pty Ltd	
Date	

Government of **Western Australia**
Department of **Environment Regulation**

Decision Document

Environmental Protection Act 1986, Part V

Proponent: BHP Billiton Petroleum Pty Ltd

Licence: L8553/2011/1

Registered office:	Level 22, 45 Clarence St SYDNEY NSW 2000
ACN:	006 918 832
Premises address:	Macedon Gas Project Lot 500 on Deposited Plan 69197 TALANDJI WA 6710
Issue date:	Friday, 3 February 2012
Commencement date:	Monday, 6 February 2012
Expiry date:	Thursday, 5 February 2017

Decision

Based on the assessment detailed in this document, the Department of Environment Regulation (DER), has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by: Haley Wilson
Regional Environmental Officer

Decision Document authorised by: Alana Kidd
Regional Leader

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application for a works approval or licence, and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

Works approval and licence conditions
DER has three types of conditions that may be imposed on works approvals and licences. They are as follows;

Standard conditions (SC)

DER has standard conditions that are imposed on all works approvals and licences regardless of the activities undertaken on the Premises and the information provided in the application. These are included as the following conditions on works approvals and licences:

Works approval conditions: 1.1.1-1.1.4, 1.2.1, 1.2.2, 5.1.1 and 5.1.2.

Licence conditions: 1.1.1-1.1.4, 1.2.1-1.2.4, 5.1.1-5.1.4 and 5.2.1.

For such conditions, justification within the Decision Document is not provided.

Optional standard conditions (OSC)

In the interests of regulatory consistency DER has a set of optional standard conditions that can be imposed on works approvals and licences. DER will include optional standard conditions as necessary, and are likely to constitute the majority of conditions in any licence. The inclusion of any optional standard conditions are justified in Section 4 of this document.

Non standard conditions (NSC)

Where the proposed activities require conditions outside the standard conditions suite DER will impose one or more non-standard conditions. These include both premises and sector specific conditions, and are likely to occur within few licences. Where used, justification for the application of these conditions will be included in Section 4.

2 Administrative summary

Administrative Details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	10	1,730,000 tonnes per annual period
	34	1,730,000 tonnes per annual period
Application verified Application fee paid	Date: 13 May 2011 Date: 7 June 2011	
Works Approval has been complied with Compliance Certificate received	Yes ☒ No ☐ N/A ☐ Yes ☒ No ☐ N/A ☐	
Commercial-in-confidence claim	Yes ☐ No ☒	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes ☒ No ☐	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes ☒ No ☐	Referral decision No: 1838 Managed under Part V ☐ Assessed under Part IV ☒
Is the proposal subject to Ministerial Conditions?	Yes ☒ No ☐	Ministerial statement No: 844 EPA Report No: 1360
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes ☐ No ☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes ☐ No ☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes ☐ No ☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal

BHP Billiton Petroleum Pty Ltd (BHP) operates the Macedon Gas Plant, located approximately 17km south of Onslow (Figure 1). This is a domestic gas project using the offshore Macedon gas field. Gas is transported via a subsea pipeline to the Macedon Gas Plant, where it is treated and subsequently exported through a sales gas pipeline to an injection point on the Dampier to Bunbury Natural Gas Pipeline. Construction of the Macedon Gas Plant was approved under works approval W4865/2011/1.

For a domestic gas plant, the principle emissions of concern are emissions to air. Currently, the significant point source air emissions associated with the Macedon Gas Plant are from the operation of the sales gas turbines, the power generation turbines and the two flares. Flaring occurs during scheduled maintenance intervals and upset conditions. There is one high pressure multipoint flare for pressure relief and for emergency blow downs and one low pressure multipoint flare for destruction of vapours from operational flaring and storage tank breathing. It is anticipated that after approximately five years of operation, the wet gas turbines will be required when reservoir pressure declines.

Initially, to support the construction of the gas plant, BHP developed a worker accommodation camp for 300-350 people and a wastewater treatment plant (WWTP) sized to treat a maximum of 146 cubic metres (m^3) per day of sewage. Treated wastewater (TWW) was disposed of via spray irrigation to an area approximately 3.6 hectares (ha) in size located south west of the camp. The WWTP was approved under works approval application W4841/2010/1. This WWTP has since been transferred to Bechtel for use as part of the Wheatstone Project.

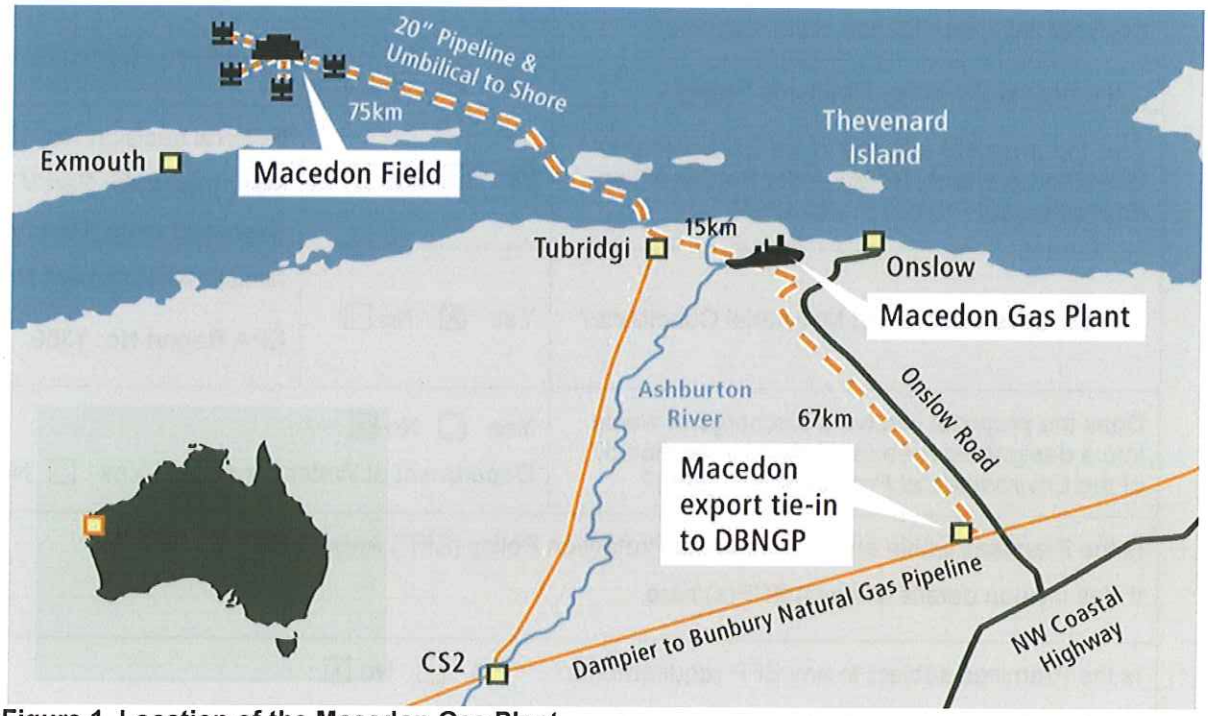


Figure 1. Location of the Macedon Gas Plant

2014 February Amendment
Operating licence L8553/2011/1 was amended in February 2014 to include Category 10 and 34. A further amendment will be required when the operation of the wet gas turbines commence, in order to include the additional emission and monitoring points.

2014 March Amendment
This Licence was amended to remove category 54 WWTP as the WWTP has been transferred to Bechtel for use in the Wheatstone Project.

4 Decision table

All applications are assessed under the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987*, DER's Policy Statement - Limits and targets for prescribed premises 2006 and the risk matrix attached to this decision document in Section 6. Where other references have been used in making the decision they are detailed in the decision table.

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	L1.2.3-1.2.5 L1.3.1-1.3.3	OSC NSC	**Operation** *Emission Significance* - 1 *Socio-political context* - No concern or interest. *Risk Assessment* - D – licence conditions The operation of the Macedon Gas Plant will require the use and storage of a range of hazardous materials, including: • diesel for emergency generators and firewater pumps; • methanol storage; • condensate storage; • LPG for flare pilot backup; • operational chemicals such as biocide, corrosion inhibitor, hypochlorite; and • lubricants, oily water and waste oil. Licence conditions 1.2.3 and 1.3.4 have been imposed on the Licence to require the storage of environmentally hazardous materials in accordance with the code of practice for the storage and handling of dangerous goods and to require the recovery and disposal of spills outside of containment systems. Uncontaminated stormwater is diverted around operational areas via stormwater drains and collected in a high density polyethylene (HDPE) lined stormwater pond. Potentially contaminated stormwater is treated through an oily water separator prior to discharge to the	Application supporting documentation Code of practice for the storage and handling of dangerous goods, Department of Mines and Petroleum, Government of Western Australia

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			evaporation pond. Condition 1.2.5 has been included on the Licence to ensure that acceptable stormwater management is implemented on an ongoing basis. Two evaporation ponds are used on site to dispose of water of condensate, produced formation water, reverse osmosis plant reject water and treated oily water. These HDPE lined ponds have been designed to accommodate a 1 in 100 year annual recurrence interval (ARI) rainfall event. NSC 1.3.4 has been included on the Licence to ensure that produced water is only discharged to these containment structures and that a freeboard of 300 millimetres is maintained to prevent discharges to the environment during high rainfall events. Details of DER's assessment and decision making are included in Appendix A.	
Emissions general	L2.1.1	OSC	Descriptive limits will be set through condition 2.6.2 of the licence and therefore OSC regarding recording and investigation of exceedances of limits or targets has been included.	N/A
Point source emissions to air including monitoring	L2.2 and L3.2	OSC	**Operation** *Emission Significance* – 3 *Socio-political context* – Medium - high *Risk Assessment* – Licence conditions, limits set Details of DER's assessment and decision making are included in Appendix B.	Application supporting documentation NEPM (Ambient Air Quality), 1997 NEPM (Air Toxics), 1996 Ambient Air Assessment Criteria, National Environmental Protection Measure (Ambient Air Quality)

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Point source emissions to surface water including monitoring	L2.3 and L3.3	N/A	**Operation** *Emission Significance* – 1 *Socio-political context* – No concern or interest *Risk Assessment* – E – No regulation, other management mechanisms There will be no point source emissions to water during operation of the Macedon Gas Plant. No specified conditions relating to point source emissions to water or the monitoring of such emissions are required to be added to the Licence.	Application supporting documentation *Environmental Protection (Unauthorised Discharges) Regulations 2004*
Emissions to land including monitoring	L2.4 and L3.4	N/A	**Operation** *Emission Significance* – 1 *Socio-political context* – Low concern or interest *Risk Assessment* – E – No regulation, other management mechanisms There will be no planned discharges to land during operation of the Macedon Gas Plant.	*Environmental Protection (Unauthorised Discharges) Regulations 2004*
Point source emissions to groundwater including monitoring	L2.5 and L3.5	N/A	**Operation** *Emission Significance* – 1 *Socio-political context* –No concern or interest *Risk Assessment* – E – No regulation, other management mechanisms There are no point source emissions to groundwater during operation of the gas plant. No specified conditions relating to point source emissions to groundwater or the monitoring of such emissions are required to be added to the Licence.	General provisions of the *Environmental Protection Act 1986*
Fugitive emissions	L2.6	N/A	**Operation** *Emission Significance* – 1	General provisions of the *Environmental Protection*

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			Socio-political context –No concern or interest *Risk Assessment* – E – No regulation, other management mechanisms An analysis of the light spill from the plant during operation has identified that an unshielded light source above 15 mAHD could have the potential to be seen by a standing person at a number of identified receptor locations. In addition, these light sources could shine directly onto beaches that are known to support turtle breeding. Light sources below 15 mAHD have are not likely to shine directly on these beaches. BHP has implemented the following measures to manage these potential impacts: • all permanently lit light sources from the gas plant are below 15 mAHD, including the low pressure and high pressure flares which have been installed at ground level; • area lighting has been equipped with glare shields; and • equipment higher than 15 mAHD which requires lighting for safe operational inspection and maintenance has manually activated lighting so it is only used when access is required. Fugitive dust emissions during operation are minimised through the implementation of the following measures: • minimisation of exposed soil; • rehabilitation of temporarily disturbed areas; and • vehicle speed restrictions. The measures described above are considered sufficient to appropriately manage the impacts associated with fugitive light and dust emissions. No specified conditions relating to fugitive emissions are required to be added to the Licence.	*Act 1986*

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Odour	L2.7.1	OSC	**Operation** *Emission Significance* – 1 *Socio-political context* – No concern or interest *Risk Assessment* – E – No regulation, other management mechanisms The Macedon Gas Plant is situated at a remote location, with the closest public use area being the Ashburton River, located approximately 4 km from the plant. There are no odour emissions associated with the operation of the plant which are likely to cause a nuisance to nearby sensitive receptors. OSC 2.7.1 has been included on the Licence to ensure that odour does not impact on sensitive receptors outside of the premises. A condition has also been imposed on the Licence, requiring BHP to maintain a complaints management system and to report all complaints received in the Annual Environmental Report.	General provisions of the *Environmental Protection Act 1986*
Noise	L2.8	N/A	**Operation** *Emission Significance* – 1 *Socio-political context* – No concern or interest *Risk Assessment* – E – No regulation, other management mechanisms Noise emissions are generated from the operation of the sales gas and power generation compressors, flares and piping. Noise emission monitoring was conducted during commissioning of the gas plant to assess compliance with the noise emission criteria previously established in the planning process.	*Environmental Protection (Noise) Regulations 1997.* General provisions of the *Environmental Protection Act 1986*

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			During the assessment is was determined that at all long-term compliance noise monitoring positions, no audible noise from the Macedon Gas Plant was present. Noise at all compliance monitoring locations was dominated by noise from other sources, including traffic on the Wheatstone LNG Project access road and flora and fauna. Notwithstanding this, the average noise levels at the noise monitoring location are typically within 1 dB of compliance with the established targets. No specified conditions relating to noise emissions are required to be added to the Licence.	
Monitoring general	L3.1.1-L1.3.5	OSC	During operation, the monitoring of point source emissions to air and land, and of ambient groundwater quality is carried out. OSCs 3.1.1-3.1.5 have been included on the Licence to specify the general requirements which need to be considered when monitoring is conducted.	Continuous Emission Monitoring System (CEMS) Code for Stationary Source Air Emissions, Department of Environment & Conservation, Government of Western Australia
Monitoring of inputs and outputs	L3.6	N/A	No specified conditions relating to the monitoring of inputs and outputs are required to be added to the Licence.	
Process monitoring	L3.7	N/A	No specified conditions relating to process monitoring are required to be added to the Licence.	
Ambient quality monitoring	L3.8	OSC	During operation of the gas plant, monitoring of groundwater quality in the vicinity of the evaporation ponds is carried out. Results of this monitoring is compared to background water quality to determine if there has been any contamination of groundwater quality from the	Australian Standard AS/NZS 5667.1 – Water Quality – Sampling – Guidance on the Design

DECISION TABLE				
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**OSC or NSC**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			operation of the evaporation ponds. Monitoring is conducted on an annual basis and the following parameters are analysed: • pH; • standing water level; • electrical conductivity; • total petroleum hydrocarbons; • benzene; • toluene; • ethylbenzene; • xylene; • mercury; • lead; • arsenic; • copper; • nickel; • cadmium; and • chromium. OSC3.8.1 has been added to the Licence to require the annual monitoring of ambient groundwater quality. BHP is required to report the results of this monitoring in the Annual Environmental Report for the Macedon Gas Plant.	of sampling programs, sampling techniques and the preservation and handling of samples Australian Standard AS/NZS 5667.11 – Water Quality – Sampling – Guidance on the sampling of groundwaters Standard Methods for Examination of Water and Wastewater, American Public Health Association – American Water Works Association – Water Environment Federation
Meteorological monitoring	L3.9	N/A	No specified conditions relating to meteorological monitoring are required to be added to the Licence.	N/A
Improvements	L4	N/A	No specified conditions relating to improvements are required to be added to the Licence.	N/A
Information	L5.1 – L5.3	N/A	Standard conditions relating to the maintenance of records and reporting have been imposed on the Licence.	N/A

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
20/6/2011	Application advertised in The West Australian (or other relevant newspaper)	No comment received.	N/A.
13/7/2011	Proponent sent a copy of draft instrument	Minor comments/amendments.	Comments incorporated into licence.
23/1/2014	Proponent sent a copy of draft amended instrument.	Minor comments/amendments.	Comments incorporated into licence.

6 Emissions and discharges risk assessment matrix

Note: These matrix are taken from the current DER Officer's Guide to Emissions and Discharges Risk Assessment May 2006.

Table 1: Measures of Significance of Emissions

Emissions as a percentage of the relevant emission or ambient standard		Worst Case Operating Conditions (95th Percentile)			
		>100%	50 – 100%	20 – 50%	<20%*
Normal Operating Conditions (50th Percentile)	>100%	5	N/A	N/A	N/A
	50 – 100%	4	3	N/A	N/A
	20 – 50%	4	3	2	N/A
	<20%*	3	3	2	1

*For reliable technology, this figure could increase to 30%

Table 2: Socio-Political Context of Each Regulated Emission

		Relative proximity of the interested party with regards to the emission				
		Immediately Adjacent	Adjacent	Nearby	Distant	Isolated
Level of Community Interest or Concern*	5	High	High	Medium High	Medium	Low
	4	High	High	Medium High	Medium	Low
	3	Medium High	Medium High	Medium	Low	No
	2	Low	Low	Low	Low	No
	1	No	No	No	No	No

Note: These examples are not exclusive and professional judgement is needed to evaluate each specific case

*This is determined by DER using the DER "Officer's Guide to Emissions and Discharges Risk Assessment" May 2006.

Table 3: Emissions Risk Reduction Matrix

		Significance of Emissions				
		5	4	3	2	1
Socio-Political Context	High	A	A	B	C	D
	Medium High	A	A	B	C	D
	Medium	A	B	B	D	E
	Low	A	B	C	D	E
	No	B	C	D	E	E

PRIORITY MATRIX ACTION DESCRIPTORS
A = Do not allow (fix)
B = licence condition (setting limits + EMPs - short timeframes)(setting targets optional)
C = licence condition (setting targets + EMPs - longer timeframes)
D= EIPs, other management mechanisms/licence conditions (monitoring/reporting)/other regulatory tools
E = No regulation, other management mechanisms

Appendix A

General emissions

Gas Plant
During operation, there is a risk of spills of potentially hazardous material from the evaporation pond, storage tanks or pipelines.

Liquid wastes
During operation of the gas plant, the following liquid wastes are generated, which are disposed of to the on-site evaporation ponds:

- water of condensate (non-saline water that condenses as a result of the expansion and cooling of the natural gas as it moves from the reservoir to the gas plant);
- up to 160 m^3 per day of produced formation water which is typically saline water which underlies the oil and gas deposits. This will typically be produced towards the end of the well life; and
- brine from the RO plant.

There are two evaporation ponds, dual lined with 5 mm HDPE, each with a capacity of 13,000 m^3 and a leak detection system to prevent leakage through to the surrounding environment. The evaporation ponds have been sized to ensure they are capable of evaporating the expected water of condensate, produced formation water volumes and brine from the reverse osmosis plant, with additional capacity to allow for rainfall from storm events to be captured without overflow. The ponds have been designed to accommodate a 1 in 100 ARI rainfall event. Visual inspections of the evaporation ponds are conducted quarterly and full perimeter fencing has been installed to restrict fauna and unauthorised access.

The leak detection consists of a perforated PVC pipe located in a thin bed of sand between the two HDPE liners that drains to the north of the evaporation ponds to a leachate monitoring well, which provides visual evidence of any leakage taking place from the upper HDPE liner.

Monitoring of the groundwater in the vicinity of the evaporation ponds will be conducted and compared to background water quality to determine if there has been any contamination of groundwater quality from the evaporation ponds. This monitoring is discussed further in the ambient monitoring section of this document.

Hazardous materials
Licence conditions relating to the storage of environmentally hazardous materials and stormwater management have been included on the Licence under general conditions. BHP has also implemented the following management measures with respect to the storage of hazardous materials:

- environmentally hazardous substances are stored in containment areas designed to prevent and contain releases of environmentally hazardous substances, and in accordance with separation and compatibility requirements;
- procedures for bringing chemicals to site are followed including assessment and hierarchy of control applied and ensuring a Materials Safety Data Sheet (MSDS) is available;
- effective spill clean-up equipment is readily available at each work site and where hydrocarbons and chemicals are stored and used;
- hydrocarbon and chemical handling activities are conducted in designated areas;
- contaminated soil or hazardous waste is removed by a controlled waste carrier to an offsite, licensed facility;
- automatic shut-down systems to prevent tank overflows;
- low pressure flare for the breathing of tanks; and

- potentially contaminated water is treated through an oily water separator which has been installed downstream of bunded and kerbed areas to separate hydrocarbons.

OSCs relating to stormwater management have been included on the Licence and BHP has also implemented the following stormwater management measures:

- location of the plant above the 1 in 100 ARI rainfall event flood levels;
- a HDPE lined stormwater pond captures the first flush of stormwater runoff from un-bunded plant process areas; and
- bunding has been installed under all vessels that contain hazardous liquids which diverts to an oily water separator.

Appendix B

Point source emissions to air including monitoring

For a domestic gas plant, the principle emissions of concern are emissions to air. Currently, the significant point source air emissions associated with the Macedon Gas Plant are from the operation of the sales gas turbines, the power generation turbines and the two flares. It is anticipated that after approximately five years of operation, the wet gas turbines will be required when reservoir pressure declines.

Sales gas turbine
Three, two-shaft, Taurus 70 gas turbines deliver gas to the Dampier to Bunbury Natural Gas Pipeline (DBNGP). Two of the turbines operate at 100 % load, each maintaining 50 % of the gas plant compression capacity, while the third turbine is on cold standby for maintenance purposes or very high ambient temperature conditions or service situations.

The SoLoNOx dry emissions control technology has been selected for the reduction of NOx emissions from the sales gas turbines. The SoLoNOx dry emissions control technology was selected over wet low NOx technology as it does not require a dedicated demineralised waste source, provides better efficiency in NOx removal and is better suited to high turndown cases and variable loads. The SoLoNOx reduces pollution by limiting the formation of NOx, CO and unburned hydrocarbons. The system uses lean pre-mix combustion to lower the maximum flame temperature and reduce pollution formation.

The heat input rating for the Taurus 70 SoLoNOx turbine is 22 MW with a 5.4 MW rate power output at the designed ambient conditions (42 °C) of the Gas Plant.

Power generation gas turbines
Four Saturn 20-1601 gas turbines provide power to the site. These turbines will generate 1.9 MW for the first five years (until wet compression is required) and 2.2 MW for the remaining 15 years. Diesel power generators provide contingency for these units. The Saturn 20 is a small gas turbine of 1.2 MW ISO rating at 15 °C, de-rated to approximately 0.95 MW at 42 °C ambient temperature. Unlike the Taurus 70 gas turbines, the SoLoNOx option was not installed on the Saturn 20 gas turbines as it was not an available option.

The Saturn 20 gas turbines have been sized to provide adequate spinning reverse to increase plant uptime during the loss of a single generating unit, while at the same time is under sufficient load to operate at an acceptable point on the efficiency curve. Continuity of power supply for the plant and the ability to increase power demand instantaneously is a critical design requirement.

Flares
One high pressure multipoint flare for pressure relief and for emergency blow downs and one low pressure multipoint flare for destruction of vapours from operational flaring and storage tank breathing is used, instead of venting hydrocarbons direct to the atmosphere. Flaring occurs during plant commissioning, scheduled maintenance intervals and upset conditions. As the process starts up on recycle, flaring is not required during normal start-up. Methanol emissions from the hydrate inhibitor tank and vapours from the hot oil storage tank are directed to the low pressure flare for venting.

Other air emission sources
In addition to the above, minor point source air emissions are expected from the 1.6 MW diesel power backup generator, condensate offloading facility and fugitive emissions from leaks of seals, gaskets and valves.

DER has reviewed the proponents impact assessment for emissions to air from the premises and is satisfied that the assessment provided by the proponent has been undertaken in an appropriate manner. DER has scrutinised the proponents proposal to ensure they are adopting best practice to prevent and minimise emissions to air and is satisfied that appropriate controls have been adopted at the premises. Under Ministerial Statement 844, the proponent was required to submit a report to the Environmental Protection Authority (EPA) showing the basis on which best practice was determined. The proponent received advice from the EPA on the 11 July 2011 advising that the requirements of the relevant ministerial conditions have been satisfied.

The proponent modelled the potential effects on air quality from emissions to air using Ausplume which is accepted by DER as a suitable model. The way in which the proponent has used the dispersion model, its selection of input data and the assumptions made have been reviewed by DER's Air Quality Management Branch. DER is satisfied that the modelling presents reliable conclusions on the predicted concentrations of all pollutants.

Using the National Pollution Inventory (Australia) and AP-42 (United States) emission estimation manual for the oil and gas industry, the proponent determined that volatile organic compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide (CO) and sulphur dioxides (SO_x) are the most significant pollutants generally emitted from processes likely to occur during the operational phase of the Macedon Gas Plant. The proponent has screened out SO_x as being insignificant as the gas plant is run off fuel gas, as opposed to diesel which is associated with increased concentrations of SO_x emissions. DER agrees that it is acceptable to screen out emissions of SO_x. Emissions of volatile organic compounds (VOCs), nitrogen oxides (NOx) and carbon monoxide (CO) were not screened out as being insignificant.

The results of the modelling are presented in Table 4 below and represent the maximum ground level concentrations predicted by the dispersion modelling, compared against the National Environmental Protection (Ambient Air Quality) Measure (NEPM).

Table 4: Modelled ambient air quality

Parameter	Averaging Period	Maximum modelled	Assessment Criteria (NEPM)	Percentage of NEPM Criteria
NO_2	Annual Mean	3.1 µg/m3	61 µg/m3	0.05 %
	Hourly	100 µg/m3	246 µg/m3	40.6 %
CO	8 Hourly	40 µg/m3	1000 µg/m3	4 %
	1 Hourly	130 µg/m3	3000 µg/m3	4.3 %
VOC	Yearly	0.28 µg/m3	50 µg/m3 Formaldehyde	0.56 %
	Yearly	0.72 µg/m3	9 µg/m3 Benzene	8 %

The predicted levels for all emissions are within the NEPM guidelines and are not expected to have the potential to give rise to significant pollution. To ensure this is the case, emission limits have been included in the licence.

Point source emissions of NOx have been compared against the Environmental Protection Authority's (EPA) Guidance on the Assessment of Environmental Factors, No.15, which provides a guideline value of 44 part per million (ppm). This assessment is presented in Table 5.

Table 5: Point source emissions of NO_x

Source	Point source emission rate	Assessment Criteria (EPA)	Percentage of Criteria
Compressor gas turbines (Sales & Wet Gas turbines)	30 ppm	44 ppm	56 %
Power Generator turbines	100 ppm		227 %

Table 5 demonstrates that the point source NOx emissions from the power generator turbines exceed the EPA's assessment criteria. This exceedance is due to the fact that the power generators run at a loading of between 50-75 %, which is not sufficient to support low NOx burners, and as such these have not been installed on the power generator turbines.

Given that the ambient air quality assessment criteria have been met, DER considers that this exceedance in the NOx point source emissions are of a low risk to the environment and sensitive receptors. Furthermore, results of emissions testing conducted during commissioning (Table 6) indicates that NOx emissions are meeting expected design criteria.

Table 6: Results of emissions testing conducted in December 2013 during commissioning.

Stack	NOx (ppm)
GTG – A	40
GTG – B	50
GTG – C	15
GTG – D	28
SGC – A (47% load)	<2
SGC – A (71% load)	5
SGC – B (71% load)	3.8
SGC – C (71% load)	<2

** All results have been adjusted to 15% oxygen.

At the time of the emissions testing the GTGs were operating at a loading of 16%. A higher load is was not achievable as there was no Wet Gas Compressor installed on the plant to provide an additional loading. Monitoring conducted during operation of the plant, in accordance with the conditions of the licence, will verify emissions from GTG's when operating at a higher load.

Limits/Targets

Based on the findings of the air quality assessment, DER has imposed emission limits on the point source emissions to air through OSCs 2.2.1 and 2.2.2. The limits and targets reflect the emission levels that have been considered within the air quality assessment and demonstrated through this assessment, to not pose a significant risk to the environment. Actual emissions are expected to be below these emission limits and targets. Once the facility is operational and actual emissions have been identified, DER will consider applying additional conditions to the licence to target emissions to lower levels. OSCs 2.2.3 and 2.3.4 have been added to the Licence to provide an exemption from meeting the determined limits during start up, shut down or upset conditions, provided all practical measures have been implemented to minimise emissions.

Emissions Monitoring

Monitoring requirements for point source air emissions have been imposed through OSC 3.2.1. Condition 3.2.2 has been imposed on the Licence to ensure that monitoring is conducted appropriately, in accordance with Australian Standards and/or the relevant part of the CEMS Code. Condition 3.2.3 has been included on the Licence to ensure all sampling and analysis is undertaken by a holder of NATA accreditation for the relevant methods of sampling and analysis.