

# Appendix 3: Biogas Regulatory Review

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## Table of Contents

<b>Introduction</b>	<b>3</b>
Relevant regulations and Australian Standards industrial biogas production and use	4
Aspects of industrial biogas regulation	4
<b>Biogas Safety Regulations</b>	<b>5</b>
State by State Biogas Safety Regulations	5
State by State Biogas Safety Contact Details	11
<b>Biogas Environmental Regulations</b>	
<b>122</b>	
State by State Environmental Regulations	
122	
<b>Abbreviations</b>	<b>17</b>
<b>References</b>	<b>17</b>

## Introduction

Biogas is the product of anaerobic biological breakdown of organic substances. Anaerobic ponds or lagoons (the terms are interchangeable) are a common treatment step of wastewater produced from the meat industry. The technology is simple and inexpensive to operate while significantly reducing the wastewater organic loading. The by-product, biogas, is both a valuable fuel and a greenhouse gas (contributing towards carbon emissions). Captured biogas can be used to fuel a boiler or for co-generation. The burning of the biogas also significantly reduces carbon emissions. Hence, the covering of the anaerobic ponds has recently become popular.

The collection and handling of biogas in covered anaerobic lagoons (CAL) from the bacterial degradation of meat processing wastewater is accompanied by a number of hazards, the most significant of which include:

- The formation of hydrogen sulphide gas (H<sub>2</sub>S), which is toxic
- The flammability of biogas when mixed with air in the appropriate proportions
- Suffocation due to the exclusion of air from especially confined spaces.

In Australia, biogas falls under a regulatory framework which varies significantly from State to State. Biogas regulation tends to be viewed through State-idiosyncratic lenses including:

- Dangerous goods regulations
- Fuel gas regulations, especially in States with a history of coal mining incidents
- OH&S regulations with their emphasis on duty of care and ALARP (As low as reasonably practicable) approach to risk management.

For people new to managing biogas risks, this variance in approach and State authority governing biogas can be very confusing and make it challenging to find the appropriate advice.

This section seeks to outline the current position regarding regulation of biogas production, storage, transport and use on a State-by-State basis. The work updates the excellent review in the RIRDC publication "Assessment of Australian Biogas Flaring Standards" released in April 2008. Current State Government contacts are identified and provided for easy access to advice. These people have graciously consented to their details being included.

### Relevant regulations and Australian Standards to industrial biogas production and use

Biogas safety and environmental regulations are enforced by State Government entities. Both the relevant entity and the regulations vary from State to State, but in all cases the regulations are based on, but not limited to, the interpretation of the following Australian standards:

- AS 3814 – 2009 (AG501) Industrial and commercial gas-fired appliances
- AS 5601 – 2010 (AG 601) Gas Installations
- AS 1375 SAA Industrial Fuel Fired Appliances.

Additional standards that may apply include:

- AS 1596 - 2008 LP Gas – storage and handling
- AS 2885 – 2012 Pipelines – Gas and liquid petroleum
- AS 4645.2:2008 Steel pipe systems (supercedes AS 1697 Gas pipelines)
- AS 4645.3:2008 Plastic pipe systems (supercedes AS 3723 Installation and maintenance of plastic pipe systems for gas).

### Aspects of industrial biogas regulation

There are various aspects of regulation involved with industrial biogas facilities. These can be subdivided into three groups:

1. Regulations governing the manufacture and installation of gas equipment including flares, LPG flare pilot ignition systems, boilers and gas-fired cogeneration equipment. These are collectively termed Type B appliances. Typically the vendor of such equipment will have obtained the necessary approvals and require appropriately trained personnel to install the equipment.
2. Workplace health and safety or more specific, non OH&S regulations concerning hazards associated with biogas production, storage, transport and use at a specific site. Typically these will be the responsibility of the site and will apply during construction and normal operation.
3. Environmental regulations concerning emissions from gas fuel (e.g. biogas) burning. These will be site-specific and may involve exhaust emission quality parameters being applied to the site through the environmental licence.

### Biogas Safety Regulations

This section addresses the first two aspects of industrial biogas regulation:

1. Manufacture and installation of Type B appliances
2. Workplace health and safety, or the like, regulations.

### State by State Biogas Safety Regulations

The nature and enforcement of safety regulations in each State vary significantly due to the variable definition of biogas and the approach of the responsible enforcing body. The safety regulations typically cover:

- the installation of Type B appliances (flares, boilers and cogeneration units)
- the management of hazards associated with biogas production, storage, transport and use during operation.

Table 1 summarises the key aspects of enforceable regulations for each State. Table 2 summarises the relevant legislation and enforcing authority. A discussion of key aspects for each State is covered below.

**Table 1: Summary of regulatory requirements for each State for biogas**

STATE OR TERRITORY	TYPE B APPLIANCE REGULATION	IS BIOGAS SPECIFICALLY REGULATED?	RISK ASSESSMENT REQUIRED?	MANAGEMENT PLAN REQUIRED?	FEES?
Qld	Yes	Yes	Yes	Yes	Yes
NSW	No	No	No	No	No
Vic	Yes	Yes	No	No	No
Tas	Yes	Yes	Yes	Yes	No
SA	Yes	No	No	No	No
WA	Yes	Yes	Yes	Yes	Yes
NT	Yes	Yes	Yes	No	No

**Table 2: Relevant regulatory authority for each State**

STATE	CURRENT REGULATION	RELEVANT AUTHORITY
<b>Qld</b>	Petroleum and Gas (Production and Safety) Regulations 2004	Petroleum & Gas Inspectorate, Safety & Health Division, Department of Natural Resources and Mines
<b>NSW</b>	Gas Supply (Gas Appliances) Regulation 2012	WorkCover NSW Department of Fair Trading
<b>Vic</b>	Gas safety (gas installation) regulations 2008	Energy Safe Victoria
<b>Tas</b>	Gas Act 2000 and Gas Safety Regulations	Workplace Standards, Department of Justice, Tasmania
<b>SA</b>	Gas Act 1997	Office of the Technical Regulator, Department for Manufacturing, Innovation, Trade, Resources and Energy, South Australia
<b>WA</b>	Gas Standards (gasfitting and consumer gas installation) regulations 2000	Energy Safety, Department of Commerce,
	Dangerous Goods Safety (storage and handling of non explosive) regulations 2007	Resource Safety Division, Department of Mines and Petroleum
<b>NT</b>	Dangerous Goods Regulations	NT Worksafe Department of Justice

### Queensland

Biomethane (biogas) is defined as petroleum and fuel gas under the Petroleum and Gas (Production and Safety) Act 2004 and safety aspects are covered under the Petroleum and Gas (Production and Safety) Regulations 2004. The Department of Natural Resources and Mines have developed an information pamphlet on Biomethane gas installations - Safety legislative obligation accessed online at <http://mines.industry.qld.gov.au/assets/safety-and-health/biogas-info-sheet.pdf>.

#### Key aspects of the regulations:

1. There is no mass or volume biogas thresholds associated with the regulation. It applies to any scale of biogas production, storage, transport and use whether in CALs or not
2. The operator of the biogas system (typically the meat processing plant operator) is responsible for the obligations of the Act
3. The design, installation and operation of the Covered Anaerobic Lagoon (CAL) itself is not covered by the regulation
4. The construction material of the biogas pipeline from the CAL to the intended uses (flaring, boilers, etc) is governed by the regulation. This regulation states the preference for construction materials adhering to AS 5601 that stipulates that non-metallic fittings shall not be used above ground (Section 4.3 and Table 4.1)
5. The regulations apply to the transport and use of biogas.

Key requirements to satisfy safety legislative obligation include:

1. Development of a Safety Management Plan (SMP). The operator of the biogas system is required to make a SMP prior to commissioning the installation and implement and maintain it. The SMP must be made for each stage of the plant (commissioning, operation, maintenance/modification and decommissioning). Section 675 of the Act lays out the content of the SMP
2. Appointment of an
  - (i) executive safety officer
  - (ii) operator
  - (iii) site safety manager.
3. Conduct an independent risk assessment for use of unodourised gas (H<sub>2</sub>S is not a valid odouriser)
4. Obtain an approval and certification of biogas gas appliances
5. Ensure installers are licensed or competent under the SMP
6. Lodge annual safety report and pay associated annual fee (currently \$3,731 pa). The fee is per site, not per CAL.

Queensland regulations are currently the most rigorous and are the same as those enforced for high pressure, large scale gas installations.

### **NSW**

The Department of Fair Trading NSW enforces the Gas Supply (Gas Appliances) Regulation 2012 through WorkCover NSW. This legislation does not currently have any enforceable legislation on the production, storage, transport or use of biogas or the installation of Type B gas appliances for biogas systems.

The NSW Department of Planning requires submission of biogas flare system plans and preliminary hazard analysis for planning approval. Final consent requirements may include approval of a final hazards analysis and fire safety study by the NSW Fire Brigades.

Note that the operating site retains responsibility for the safe installation, operation, maintenance and decommissioning of biogas systems under the OH&S general duty of care.

### **Victoria**

EnergySafe Victoria (ESV) enforces the Gas Safety (Gas Installation) Regulations 2008 and Gas Safety Act 1997. The Victorian Gas Safety Act defines gas as any gaseous fuel (Section 3) and thus the same standards apply to biogas as to natural gas and LPG.

ESV regulations cover the installation of the associated Type B appliance only. ESV only allow the commissioning of the biogas system after approval of the Gas Safety (gas installation) regulation

2008 Schedule 9 submission.

Key aspects of the regulations:

1. The regulation only applies when a Type B appliance is to be installed. There is no mass or volume biogas thresholds associated with the regulation.
2. The regulations do not specify a particular person responsible for the obligations of the Act.
3. The design, installation and operation of the Covered Anaerobic Lagoon (CAL) itself is not covered by the regulation.
4. The regulations do not currently specify the material of construction of the biogas pipeline from the CAL to the intended uses (flaring, boilers, etc). However the approval process may refer to AS 5601 that stipulates that non -metallic fittings shall not be used above ground (Section 4.3 and Table 4.1).
5. The regulations do not currently apply to the production, storage, transport or use of biogas.

Key requirements to satisfy safety legislative obligation include:

1. The only requirement is the submission of particulars detailed in Schedule 9 of the regulation for biogas system approval.

ESV do not currently require a risk assessment or site management plan for the safe operation and use of the biogas facility. There are also no fees involved.

### **Tasmania**

Workplace Standards, a division of the Department of Justice, administer the gas safety legislation in Tasmania according to the Gas Act 2000 and the Gas (Safety) Regulations 2002. They currently do not differentiate biogas from LPG and natural gas. Installation of a CAL with associated equipment would be classified as a complex gas installation that would regulate from the pond outlet to the final gas appliance.

Key aspects of the regulations:

1. The regulation only applies when a Type B appliance is to be installed (flares, boilers and co-generation equipment). There is no mass or volume biogas thresholds associated with the regulation.
2. The title(s) and position(s) of the responsible person(s) for the execution of the safety and operating plan must be provided in a safety and operating plan.
3. The design, installation and operation of the CAL itself is not covered by the regulation.
4. The regulations do not currently specify the material of construction of the biogas pipeline from the CAL to the intended uses (flaring, boilers, etc). However the complex gas system approval process may refer to AS 5601 that stipulates that non -metallic fittings shall not be used above ground (Section 4.3 and Table 4.1).



5. The regulation applies to the transport and use of biogas.

Key requirements to satisfy safety legislative obligation include:

1. The manufacture and installation of all Type B appliances and associated pipework must be certified by a qualified Tasmanian gas fitter.
2. A development approval for installation, appliance and pipework must be accepted prior to commissioning.
3. A further regulation requirement is the development of a Safety Management Plan (SMP) that includes a thorough risk assessment.

There are currently no application fees or annual fees. Further information can be obtained from the Office of the Tasmanian Economic Regulator (OTTER).

### **South Australia**

The Department of Transport, Energy and Infrastructure are the South Australian governing body for the Gas Act 1997. The Gas Act only applies to natural gas and LPG. Biogas is not regulated because it is of unknown composition and does not enter the gas network. The department will advise, if requested, on safe operating procedures but this is not a requirement.

Note that the operating site retains responsibility for the safe installation, operation, maintenance and decommissioning of biogas systems under the OH&S general duty of care.

### **Western Australia**

The WA Gas Standards (gas fitting and consumer gas installation) Regulation 2000 does not legislate for biogas as it is not classified as a fuel gas.

The storage and handling of biogas is however regulated under the Dangerous Goods Safety Act 2000 using the Dangerous Goods Safety (storage and handling of non-explosive) Regulations 2007 administered by the Department of Mines and Petroleum.

Key aspects of the regulations:

1. There are various storage volume thresholds associated with this regulation including:
  - (i) Biogas storage volumes greater than 500 L have placarding regulations
  - (ii) Biogas storage volumes greater than 5,000L have further regulation requirements and associated application and annual fees
  - (iii) Biogas storage volumes greater than 50,000L have the same regulation requirements as those imposed for volume greater than 5,000L but attract greater associated fees
  - (iv) The volume potentially stored under the cover is the regulated storage volume.
2. The designated operator(s) of the biogas system is responsible for the obligations of the Act.
3. The design and operation of the CAL is covered by the regulation with respect to the potential biogas storage volume.

4. The nature of the biogas pipeline from the CAL to the intended uses (flaring, boilers, etc) is not governed by WA regulations in respect to materials of construction.
5. The regulation applies to the storage of biogas only.

Key requirements to satisfy safety legislative obligation include:

1. A risk assessment is required when potential biogas storage volume exceeds 5,000L. The risk assessment is required to identify risks, ensure adequate safety and control measures.
2. Five year licenses are required when potential biogas storage volume exceeds 5,000L. The current fees are \$192 per annum up to 50,000L and \$638 per annum greater than 50,000 L.

### **Northern Territory**

NT Worksafe enforces regulations on gas installations and use through the Dangerous Goods Act [DG Act], Dangerous Goods Regulations 2012 and the NT Work Health and Safety (National Uniform Legislation) Regulation 2012 [WHS(NUL)]. Biogas is considered a fuel gas according to the definition “a gas or mixture of gases that may be burned with air to produce light, heat or power” (from Part IV of the Dangerous Goods Regulations).

Key aspects of the regulations:

1. The dangerous goods regulations only apply when a Type B appliance is to be installed (flares, boilers and co-generation equipment) with no associated mass or volume biogas thresholds specified. However, the WHS (NUL) regulations imposes requirements regardless of the size and specifications if “reasonably foreseeable hazards that could give rise to risks to health and safety” are identified.
2. The assigned “duty holder” is responsible for the obligations of the Workplace Health and Safety Act. The WHS (NUL) Act also requires a general duty of care to ensure the health and safety of workers and others who may be at risk due to their activities.
3. The design, installation and operation of the Covered Anaerobic Lagoon (CAL) needs to be addressed in the risk assessment as required by the WHS (NUL) regulations.
4. The nature of the biogas pipeline from the CAL to the intended uses (flaring, boilers, etc) is governed by the dangerous goods regulation 177 prohibits above ground non -metallic fittings as per AS 5601.
5. Regulation applies to the production, storage, transport and use of biogas.

Key requirements to satisfy safety legislative obligation include:

1. Gas fitting work must be carried out by a licensed contractor and NT Worksafe must be notified prior to working on or installing a fuel gas system or connections.
2. A risk assessment of the entire biogas system is required that identifies and manages any risks associated with biogas ponds, biogas train and appliances. This includes the location, design, materials, construction, installation, operation and maintenance of the ponds and their associated collection and filtration systems.

- As part of the risk management process, biogas systems should undergo a hazard and operability study (HAZOP) risk assessment and meet relevant standards to demonstrate control and risk mitigation.

### State by State Biogas Safety Contact Details

Table 3 summarises the relevant direct contact details for each Australian state or territory. It is important to contact these departments directly prior to commencing work to ensure regulations information is current.

**Table 3: Contact details for biogas safety regulation information for each State**

STATE	CURRENT REGULATION	CERTIFYING AUTHORITY	CONTACT
<b>Qld</b>	Petroleum and Gas (Production and Safety) Regulations 2004	Department of Natural Resources and Mines	Dave Sharp <i>Principle inspector</i> (07) 3404 3150
<b>NSW</b>	Gas Supply (Gas Appliances) Regulation 2012	WorkCover NSW Department of Fair Trading	Angela Keane <i>Senior Information Officer</i> (02) 4321 5040
<b>Vic</b>	Gas safety (gas installation) regulations 2008	Energy Safe Victoria	Iganzio Cannizzo <i>Manager complex gas appliance safety</i> (03) 9721 5429
<b>Tas</b>	Gas Act 2000 and Gas Safety Regulations	Workplace Standards, Department of Justice, Tasmania	Andrew Ayton <i>Acting manager for gas safety</i> (03) 6434 6218 <a href="mailto:amdrew.ayton@justice.tas.gov.au">amdrew.ayton@justice.tas.gov.au</a>
<b>SA</b>	Gas Act 1997	Office of the Technical Regulator, Department for Manufacturing, Innovation, Trade, Resources and Energy, South Australia	Bill Patience <i>Manager gas installation and appliance safety</i> (08) 8226 5790 <a href="mailto:bill.patience@sa.gov.au">bill.patience@sa.gov.au</a>
<b>WA</b>	Gas Standards (gasfitting and consumer gas installation) regulations 2000  Dangerous Goods Safety (storage and handling of non-explosive) regulations 2007	Energy Safety, Department of Commerce,  Resource Safety Division, Department of Mines and Petroleum	Kim Martin (08) 9422 5288  Iain Dainty <i>Manager Dangerous Goods Officer</i> (08) 9358 8042
<b>NT</b>	Dangerous Goods Regulations	NT Worksafe Department of Justice,	Anthony Waite <i>Manager Resource Safety and Major Hazard Facilities</i> (08) 8999 5037

**Biogas Environmental Regulations**

This section addresses the third aspect of industrial biogas regulation - environmental regulations concerning emissions from fuel gas (e.g. biogas) burning.

**State by State Environmental Regulations**

Table 4 summarises the relevant environmental regulations for each state. Further detail is provided below.

**Table 4: Current environmental air quality legislation for each State**

STATE	CURRENT REGULATION	CERTIFYING AUTHORITY
<b>QLD</b>	Environment Protection Regulation 2008 Environmental Protection (Air) Policy 2008	Department of Environment and Heritage Protection
<b>NSW</b>	Protection of the Environment Operations (Clean Air) Regulation 2010	Office of Environment and Heritage
<b>ACT</b>	Environment Protection Act 1997, Environment Protection Regulations 2005	Department of Environment and Sustainable Development
<b>VIC</b>	Environment Protection (scheduled Premises and Exemptions) Regulations 2007 State Environment Protection Policy (Air Quality Management)	Department of Sustainability and Environment
<b>TAS</b>	Environmental Management and Pollution Control Act 1994 Environment Protection Policy (air quality) 2004	Environment Division of the Department of Tourism, Arts and the Environment
<b>SA</b>	Environment Protection (Air Quality) Policy 1994	EPA South Australia
<b>WA</b>	Environment Protection Regulations 1987	Department of Environment and Conservation
<b>NT</b>	Environmental Offences and Penalties Regulations (2011)	Northern Territory Environment Protection Authority

**Queensland**

The Environment Protection Regulation 2008 states that “fuel burning (the relevant activity) consists of using fuel burning equipment that is capable of burning at least 500 kg of fuel in an hour” (Section 15). This is approximately equivalent to 1,200 m3 per hour of biogas assuming 70% methane, 25oC and 1 atm absolute pressure. In our experience, biogas production from most Australian meat processing facilities would be below this value. The regulation does not specifically discuss flares.

The Environmental Protection (Air) Policy 2008 lists air quality objectives for environmentally relevant activities. Those relevant to biogas burning are highlighted in Table 5.

**Table 5: Queensland Air Quality Objectives**

INDICATOR	ENVIRONMENTAL VALUE	AVERAGE AIR QUALITY (µG/M3 @ 00C)	PERIOD	DAYS
<b>CO</b>	Health and wellbeing	11,000	8 hr	1 day/yr
<b>H<sub>2</sub>S</b>	Health and wellbeing	160	24 hr	
	Protecting aesthetic environment	7.5	30 min	
<b>NO<sub>2</sub></b>	Health and wellbeing	250	1 hr	1 day/yr
		62	1 yr	
	Health and biodiversity of ecosystems	33	1 yr	
<b>SO<sub>2</sub></b>	Health and wellbeing	570	1 hr	1 day/yr
		230	1 day	1 day/yr
		57	1 yr	
	Protecting agriculture	32	1 yr	
	Health and biodiversity of ecosystems	22	1 yr	

**NSW**

The Office of Environment and Heritage imposes the Protection of the Environment Operations (Clean Air) Regulation 2010. Flares are defined as a “Group 6 treatment plant “and must be operated (Section 49) to ensure that:

1. The flame is present at all times while air impurities are required to be treated, and
2. For landfill gas using enclosed ground level gas flare either or both of the following requirements are complied with
  - (i) Residence time of greater than 0.6 seconds (section 50) and combustion temperature greater than 760oC (section 51), and/or
  - (ii) Destruction efficiency is more than 98% for enclosed ground level landfill gas flares (Section 52).

Table 6 lists the standards of concentration for flares. Flare emissions do not differ in greater metropolitan zones.

**Table 6: NSW standards of concentration for flares**

INDICATOR	STANDARD OF CONCENTRATION (MG/M <sup>3</sup> )	ACTIVITY
<b>VOC</b>	40	Flares
<b>Smoke</b>	No visible emission other than for a total period of no more than 5 minutes in any 2 hours	Flares
<b>NO<sub>x</sub></b>	350	Any boiler operating on gas
	10	Any turbine operating on gas generating <10MW
<b>H<sub>2</sub>S</b>	5	Any activity or plant

OEH may require the Environmental Protection License to be modified to include the flare as an additional emission point (pers. comm. C Hollingworth 12 Feb 2013).

**Victoria**

The Department of Sustainability and Environment enforces the Environment Protection (scheduled Premises and Exemptions) Regulations 2007. Approval and licensing is required for fuel burning equipment that produces class 3 indicators. The State Environment Protection Policy (Air Quality Management) 2001 specifies class 3 indicators as waste which is an extremely hazardous substance that may threaten the beneficial uses of the air environment due to its carcinogenic, mutagenic, teratogenic, highly toxic or highly persistent characteristics. It is unlikely for biogas to produce any class 3 indicators and thus does not require regulation.

**Tasmania**

The Environmental Management and Pollution Control Act 1994 is the key legislation applied by the Environment Division of the Department of Tourism, Arts and the Environment. The burning of biogas would be regulated by the Environment Protection Policy (air quality) 2004.

The regulations in stack concentrations required for new stationary sources that are relevant to biogas burning are in Table 7. For fuel burning equipment, the concentrations measured should be adjusted to compensate for variability due to the excess air rates (Schedule 1, Table 1).

Further guidelines are imposed if the authority is satisfied that emissions from a stationary source are causing or likely to cause an environmental nuisance or harm.

**Table 7: Tasmania air quality guidelines for air emissions**

INDICATOR	STANDARD APPLICABLE TO	STANDARD OF CONCENTRATION (MG/M <sup>3</sup> )
SO <sub>3</sub>	Any trade, industry or process	100
NO <sub>x</sub>	Steam boilers with gaseous fuels	350
	Gas Turbines with gaseous fuels less than 10MW	90
CO	Any activity or plant (other than cement, brick manufacture or stationary industrial diesels)	
H <sub>2</sub> S	Any trade, industry or process	5mg/m <sup>3</sup>

**South Australia**

Environment Protection (Air Quality) Policy 1994 under the Environment Protection Act 1993 is the core legislation used by South Australia.

Section 4.7 states that the occupier of a premises must not cause or permit air pollution through any failure to take all reasonable and practical measures to maintain and operate fuel burning equipment efficiently.

The maximum pollution levels relevant to biogas burning are shown in Table 8. These concentrations are prior to the admixture with air.

**Table 8: South Australia air emission quality guidelines**

INDICATOR	STANDARD APPLICABLE TO	STANDARD OF CONCENTRATION (MG/M <sup>3</sup> )
SO <sub>3</sub>	Any trade, industry or process	100
NO <sub>x</sub>	Steam boilers >150,000MJ/hr gross with gaseous fuels	350
	Gas Turbines with gaseous fuels less than 10MW	90
CO	Any activity or plant	1,000
H <sub>2</sub> S	Any trade, industry or process	5

### Western Australia

The Environment Protection Regulations 1987 lists fuel burning of more than 500kg of fuel in an hour with a sulphur content of 0.25% or more” as a prescribed premises. (Section 15). This is approximately equivalent to 1,200m<sup>3</sup> per hour of biogas assuming 70% methane, 25oC and 1 atm absolute pressure. In our experience, biogas production in Australian meat processing facilities would be below this value.

The regulations do not specify prescribed release concentrations but do impose a fee for discharges of nitrogen oxides, sulphur oxides, carbon monoxide and hydrogen sulphide. The fees are higher for metropolitan areas.

The regulation does not specifically discuss flares.

### Northern Territory

There appears to be no regulations specified for flares by the Northern Territory Environment Protection Authority at this point.



## Abbreviations

CAL	covered anaerobic lagoons
H <sub>2</sub> S	hydrogen sulphide gas
ALARP	as low as reasonably practicable
SMP	Safety Management Plan
ESV	EnergySafe Victoria
OTTER	Office of the Tasmanian Economic Regulator
WHS(NUL)	Work Health and Safety (National Uniform Legislation)
HAZOP	hazard and operability study

## References

RIRDC Publication 08/024 (2008) "Assessment of Australian Biogas Flaring Standards". Prepared by GHD Pty Ltd