Government of **Western Australia**
Department of **Environment and Conservation**

# LICENCE FOR PRESCRIBED PREMISES
## *Environmental Protection Act 1986*

**LICENCE NUMBER:** L8159/2004/2 **FILE NUMBER:** NWK 3116-02

**LICENSEE**
EDL LNG (WA) Pty Ltd
Building 17
2404 Logan Road
EIGHT MILE PLAINS QLD 4113
ACN: 064 437 789

**PREMISES**
Maitland LNG Facility
Part of Lot 3002 on Plan 42721
Maitland Industrial Estate within co-ordinates:

| | | |
|---|---|---|
| E466860: N7696412 | E466588: N7696346 | E466672: N7696133 |
| E466948: N7696132 | E466923: N7696174 | E466902: N7696183 |
| E466917: N7696188 | E466929: N7696195 | E466932: N7696207 |
| E466974: N7696223 | | |

North West Coastal Highway
KARRATHA WA 6714
(as depicted in Attachment 1)

**PRESCRIBED PREMISES CATEGORY**
Schedule 1 of the Environmental Protection Regulations 1987

| CATEGORY NUMBER | CATEGORY DESCRIPTION | CATEGORY PRODUCTION OR DESIGN CAPACITY | PREMISES PRODUCTION OR DESIGN CAPACITY |
|---|---|---|---|
| **34** | Oil or gas refining | Not applicable | 73,000 tonnes per year |

**CONDITIONS OF LICENCE**
Subject to the conditions of licence set out in the attached pages.

[redacted]
Carissa Aitken
Officer delegated under Section 20
of the *Environmental Protection Act 1986*

PPMS_TI0604 v1.1

**ISSUE DATE:** Thursday 5 July 2012
**COMMENCEMENT DATE:** Friday, 13 July 2012
**EXPIRY DATE:** Wednesday, 12 July 2017

### DEFINITIONS

In these conditions of licence, unless inconsistent with the text or subject matter:

"AS 1940" means the most recent version of the Australian Standard for the storage and handling of flammable and combustible liquids;

"Director" means Director, Environmental Regulation Division of the Department of Environment and Conservation for and on behalf of the Chief Executive Officer as delegated under Section 20 of the *Environmental Protection Act 1986;*

"Director" for the purpose of correspondence means-

Regional Leader, Pilbara Region
Department of Environment and Conservation
PO Box 835 Telephone: (08) 9182 2000
KARRATHA WA 6714 Facsimile: (08) 9144 1118;

"g/m$^3$" means (in relation to a gaseous discharge) grams per cubic metre corrected to dry gas (i.e. removal of all volume occupied by water vapour and droplets) and corrected to STP;

"g/sec" means grams per second, the mass emission rate in exhaust stack gases and effluents;

"mg/L" means milligrams per litre, the concentration of an aqueous solution and is the ratio of the mass of specific solute to the volume of solution (not solvent);

"NATA" means the Australian National Association of Testing Authorities;

"NOx" means (when used in relation to waste gases discharged to atmosphere) the sum of all oxides of nitrogen but reported as equivalent nitrogen dioxide ($NO_2$);

"Ringelmann Number" means the numbers of the shades referred to in the most recent version of British Standard: 2742 – Use of the Ringelmann and miniature smoke charts.

"STP" means standard temperature and pressure which is a temperature of 0°C and an absolute pressure of 101.325 kilopascals.

### GENERAL CONDITIONS

LIQUID CHEMICAL STORAGE

1. The licensee shall store environmentally hazardous chemicals including, but not limited to, fuel, oil or other hydrocarbons (where the total volume of each substance stored on the premises exceeds 250 litres) within low permeability ($1x10^{-9}$ metres per second or less) compound(s) designed to contain not less than 110% of the volume of the largest storage vessel or inter-connected system, and at least 25% of the total volume of substances stored in the compound.

2. The compound(s) described in condition 1 shall:
   - (i) be graded or include a sump to allow recovery of liquid;
   - (ii) be chemically resistant to the substances stored;
   - (iii) include valves, pumps and meters associated with transfer operations wherever practical. Otherwise the equipment shall be adequately protected (e.g. bollards) and contained in an area designed to permit recovery of chemicals released following accidents or vandalism;
   - (iv) be designed such that jetting from any storage vessel or fitting will be captured within the bunded area [see for example AS 1940 Section 5.8.3 (h)];
   - (v) be designed such that chemicals which may react dangerously if they come into contact, are in separate bunds in the same compound or in different compounds; and
   - (vi) be controlled such that the capacity of the bund is maintained at all times (e.g. regular inspection and pumping of trapped uncontaminated rain water).

3. The licensee shall immediately remove and dispose of any liquid resulting from spills or leaks of chemicals including fuel, oil or other hydrocarbons, whether inside or outside the low permeability compound(s), to a facility that is licensed or registered to accept such waste.

### AIR EMISSIONS

REPORTING OF FLARING

4. The licensee shall conduct monitoring to determine the Ringelmann Number of all dark smoke emissions of a shade greater than Ringelmann 1 emitted for a period of 30 minutes or more in any 24 hour period and report results in the Annual Environmental Report required by condition 10 of this licence.

5. The licensee shall provide to the Director, a report of all dark smoke emissions of a shade of Ringelmann 3 or greater emitted for a continuous period of 30 minutes or more. This report is to be provided to the Director within 24 hours of becoming aware of such an emission.

### MONITORING CONDITIONS

ANNUAL STACK SAMPLING

6. The licensee shall, in each calendar year, take a representative manual stack sample from power generators, by a NATA accredited company, for the purpose of determining NOx emissions in accordance with the requirement of conditions 7 of this licence.

7. The licensee shall report all atmospheric discharge data at STP dry for units reported as mass per volume ($g/m^3$) and mass discharge rate (g/sec) discharge.

### DISCHARGE TO LAND

MANAGEMENT OF STORMWATER RUNOFF

8. The licensee shall ensure that stormwater on the premises is adequately managed so that:
   (i) it is diverted from areas of the premises where it has the potential to become contaminated; and
   (ii) stormwater that has come into contact with waste is to be diverted into a sump on the site, or otherwise retained on the site for treatment to achieve a hydrocarbon concentration less than 15 mg/L prior to discharge or reuse.

9. The licensee shall ensure stormwater drains on the premises are kept clear of waste to allow for their effective use.

### REPORTING CONDITIONS

ANNUAL ENVIRONMENTAL REPORT

10. The licensee shall provide to the Director, by **31 August** each year, an Annual Environmental Report, which shall include, but not necessarily be limited to, all data collected in accordance with conditions of this licence. The report shall contain data collected over the previous 12 month period from **1 July** to **30 June**.

ANNUAL AUDIT COMPLIANCE REPORT

11. The licensee shall by **31 August** in each year, provide to the Director an Annual Audit Compliance Report in the form in Attachment 2 to this licence, signed and certified in the manner required by Section C of the form, indicating the extent to which the licensee has complied with the conditions of this licence, and any previous licence issued under Part V of the Act for the premises, during the period beginning **1 July** the previous year and ending on **30 June** in that year.

## ATTACHMENT 1

**LICENCE NUMBER:** L8159/2004/1 **FILE NUMBER:** NWK3116-02

### PLAN OF PREMISES


LEGEND

Hydrography, linear (hierarchy)

| Point | Easting | Northing |
|---|---|---|
| 1 | E466860 | N7696412 |
| 2 | E466588: | N7696346 |
| 3 | E466672: | N7696133 |
| 4 | E466948: | N7696132 |
| 5 | E466923: | N7696174 |
| 6 | E466902: | N7696183 |
| 7 | E466917: | N7696188 |
| 8 | E466929: | N7696195 |
| 9 | E466932: | N7696207 |
| 10 | E466974: | N7696223 |

N

Scale 1:2857

(Approximate when reproduced at A4size)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

Prepared by: tenaaw

Prepared for:

Date: 17/04/2012 2:51:49 PM

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.

Department of Environment and Conservation

Our environment, our future

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PPMS_TI

**ISSUE DATE:** Thursday 5 July 2012
**COMMENCEMENT DATE:** Friday, 13 July 2012
**EXPIRY DATE:** Wednesday, 12 July 2017

## ANNUAL AUDIT COMPLIANCE REPORT

## SECTION A
### LICENCE DETAILS

| | |
|---|---|
| Licence Number: | Licence File Number: |
| Company Name:<br><br>Trading as: | ABN: |
| Reporting period:<br>_____ to _____ | |

### STATEMENT OF COMPLIANCE WITH LICENCE CONDITIONS

1. Were all conditions of 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 initialed by the person(s) who signs Section C of this annual audit compliance report.

INITIAL:_____

**LICENCE NUMBER**: L8159/2004/1 **FILE NUMBER:** NWK3116-02

**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 DEC? | |
| ☐ Yes ☐ Reported to DEC verbally Date _____<br>☐ Reported to DEC in writing Date _____ | ☐ No |
| d) Has DEC taken, or finalised any action in relation to the non compliance? | |
| | |
| e) Summary of particulars of 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 initialed by the person(s) who signs Section C of this annual audit compliance report

INITIAL:_____

PPMS_TI0604 v1.1

**LICENCE NUMBER:** L8159/2004/1 **FILE NUMBER:** NWK3116-02

## SECTION C - SIGNATURE AND CERTIFICATION

This Annual Audit Compliance Report may only be signed by a person(s) with legal authority to sign it. The ways in which the Annual Audit Compliance Report 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 Annual Audit Compliance Report 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 and Conservation 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 and Conservation. |
| 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 and Conservation. |
| 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 and Conservation. |
| 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: _____ SIGNATURE: _____

NAME: (printed) _____ NAME: (printed) _____

POSITION: _____ POSITION: _____

DATE: ____/____/____ DATE: ____/____/____

SEAL (if signing under seal)

PPMS_TI0604 v1.1

**ISSUE DATE:** Thursday 5 July 2012
**COMMENCEMENT DATE:** Friday, 13 July 2012
**EXPIRY DATE:** Wednesday, 12 July 2017

**LICENCE: L8159/2004/2**
**FILE NUMBER: NWK3116-02**
**COMMENCEMENT DATE: 13 July 2012**
**EXPIRY DATE: 12 July 2017**

## PREMISES DETAILS

**LICENCE HOLDER AND OCCUPIER**
EDL LNG (WA) Pty Ltd
Building 17
2404 Logan Road
EIGHT MILE PLAINS QLD 4113
ACN: 064 437 789

**PREMISES**
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| E466974: N7696223 | | |

North West Coastal Highway
KARRATHA WA 6714

**PRESCRIBED PREMISES CATEGORY**
**Table 1: Prescribed premises summary**

| Category number* | Category Description* | Category Production or Design Capacity* | Premises Production or Design Capacity# | Premises Fee Component** |
|---|---|---|---|---|
| 34 | Oil or gas refining | Not applicable | 73,000 tonnes per year | More than 50,000 but not more than 100,000 tonnes per year |

* From Schedule 1 of the Environmental Protection Regulations 1987
# From application
** From Schedule 4 of the Environmental Protection Regulations 1987

This Environmental Assessment Report (EAR) has been drafted for the purposes of detailing information on the management and mitigation of emissions and discharges from the prescribed premises. The objective of the EAR is to provide a risk assessment of emissions and discharges, and information on the management of other activities occurring onsite which are not related to the control of emissions and discharges from the prescribed premises activity. This does not restrict the Department of Environment and Conservation (DEC) to assessing only those emissions and discharges generated from the activities that cause the premises to become prescribed premises.

**Basis of Assessment**
The EDL LNG (WA) Pty Ltd (EDL) mini-liquefied natural gas (LNG) facility (the LNG facility) has been assessed as "prescribed premises" Category 34 under Schedule 1 of the Environmental Protection Regulations 1987.

*Category 34 – Oil or gas refining: premises on which crude oil, condensate or gas is refined or processed.*

The LNG facility processes natural gas from the Dampier to Bunbury Natural Gas Pipeline (DBNGP) to produce up to 200 tonnes per day of LNG, which is then transported to various West Kimberley communities to be used to provide power.

# 1.0 BACKGROUND

## 1.1 GENERAL COMPANY DESCRIPTION

EDL is a wholly owned subsidiary of Energy Developments Limited, a publicly listed Australian Company. Energy Developments Limited operates a variety of projects related to the provision of renewable and clean energy in remote locations, such as the West Kimberley Power Project (WKPP). These projects primarily consist of landfill gas generation and coal mine waste methane power generation, with projects located in Australia, United States of America, United Kingdom, France, Greece and Taiwan.

EDL's LNG facility is an important component of the WKPP. The LNG product will be transported by road to various West Kimberley power stations located at Broome, Derby, Fitzroy Crossing and Halls Creek. LNG replaces the diesel fuel technology previously used at these power stations.

## 1.2 LOCATION OF PREMISES

In the early 1990's, several Pilbara locations, including the Maitland area, were identified by government as options for the development of an industrial estate, based on a selection process considering factors, such as availability of large areas of flat land, proximity to power and gas supplies and the potential to develop transport and port connections. Subsequent to further studies which identified ethnographic, physical and biological characteristics of each location, the Maitland Industrial Estate (MIE) was considered as the preferred option.

The LNG facility is located on part of Lot 3002 on Plan 42721 in the MIE, approximately 20 kilometres (km) south west of Karratha. The pipeline from the DBNGP to the LNG facility is located in a forty metre wide easement along the eastern boundary of the MIE.

### 1.2.1 Existing Environment

The MIE is located on a coastal plain, typified by low relief which rises to approximately 20 metres (m) above Australian Height Datum (AHD) at the LNG facility site. The area is dissected by a series of alluvial channels, predominately flowing in a north-west direction into a series of tidal creek systems located to the north of the DBNGP. The LNG facility has been constructed above the 100 year Annual Recurrence Interval (ARI) flood levels.

The LNG facility site and adjacent land has been significantly disturbed by fire and stock grazing. The area is dominated by hummock grasslands of *Trodia pungens* and tussock grasslands of *Eragrostis xerophila*. The low lying areas are typically dominated by ephemeral herbs and grasses such as *Xerochloa barbata*. DEC considers there to be no Rare or Priority Flora within 50 km of the site, and all species are well represented in surrounding areas.

Eleven species of protected fauna have been recorded within a 50 km radius of the LNG facility. The majority of these are bird species that are likely to inhabit the mangrove areas along the coast at Maitland, and will, therefore, not be impacted by the LNG facility, located approximately 10 km

from the coastline. In addition to the bird species, one mammal species of conservation significance has also been noted, the Orange Leaf-Nosed Bat (*Rhinonicteris aurantius*). However, this species is unlikely to utilise the site area due to the degraded state of vegetation within and around the site and the distance from the site to its preferred habitat of coastal mangroves.

Aboriginal heritage surveys of the site revealed that there were no significant ethnographic sites in the project area. Several sites of low heritage value were identified and one quarry site with associated artefact scatter, which was considered to be of moderate archaeological significance, was found approximately 70 km to the east of the pipeline corridor. An Aboriginal Heritage Management Plan was implemented by EDL during construction of the LNG facility.

## 1.3 PROCESS DESCRIPTION

The LNG process overview, from feed gas to LNG export, is shown in Figure 1 and the key characteristics of the LNG facility are shown in Table 2. The main elements of the LNG process include:

Gas feed and pre treatment
The LNG facility receives natural gas from the DBNGP, which is directed to the pre treatment system in order to remove carbon dioxide, water and other impurities. An amine scrubbing column absorbs carbon dioxide and trace amounts of sulphur from the feed gas. Molecular sieve absorber beds are used to remove water from the gas, most of which will come from the amine system. When the molecular sieves become saturated with water, they are heated and regenerated by a side stream of feed gas (regeneration gas), which collects the moisture and is later used to fuel the power generation system's gas turbines.

Liquefaction process
The treated gas is cooled in two stages in the liquefaction process. Firstly the gas is cooled to minus 60 degree celsius (°C) to remove the heavier hydrocarbon fraction, which is similar to liquefied petroleum gas and includes propane, butane and ethane. Traces of methane in the heavy hydrocarbon fraction are recovered and further cooled with the remaining gas to minus 150°C at which point it is piped in liquid form to the on-site LNG storage tanks.

LNG storage
LNG is stored in the horizontal bullet vessels prior to loading into tankers for transport to the WKPP facilities to provide fuel for power generation. The storage vessels are double-skinned, vacuum insulated and have a 325 kilolitre capacity.

Power supply
Since there is no electricity supply to the MIE, a power station was built on site to provide power for the LNG process. The power station comprises of three solar centaur gas fired turbines, each with a capacity to generate 2.8 mega watts. Typically only one gas turbine is operated at partial load although there is occasional periods where one turbine is operated at full load and a second turbine at part load during peak plant requirements. Regeneration gas from the pre treatment stage and the heavy hydrocarbon fraction from the liquefaction process are used as fuel for the power station and supplemented with natural gas from the DBNGP as required.

LNG transport
LNG from the facility is delivered via road trains to a series of power stations in the West Kimberley region located at Broome, Derby, Fitzroy Crossing and Halls Creek. The LNG is used as fuel for the power stations, which replace older diesel-fired facilities, and also to fuel the prime movers which transport the LNG.

Flaring

The LNG Plant flare is installed primarily to enable the safe disposal of process gas during start, shutdown operations and during periods of process upset. Fuel gas collected in the plants fuel gas headers and excess to the plants process heating and power generation requirements is also discharged through the flare.

The flare was constructed in accordance with the American Petroleum Institute Recommended Practise No. 520 and 521 for the installation of pressure relieving systems and is smokeless in design.

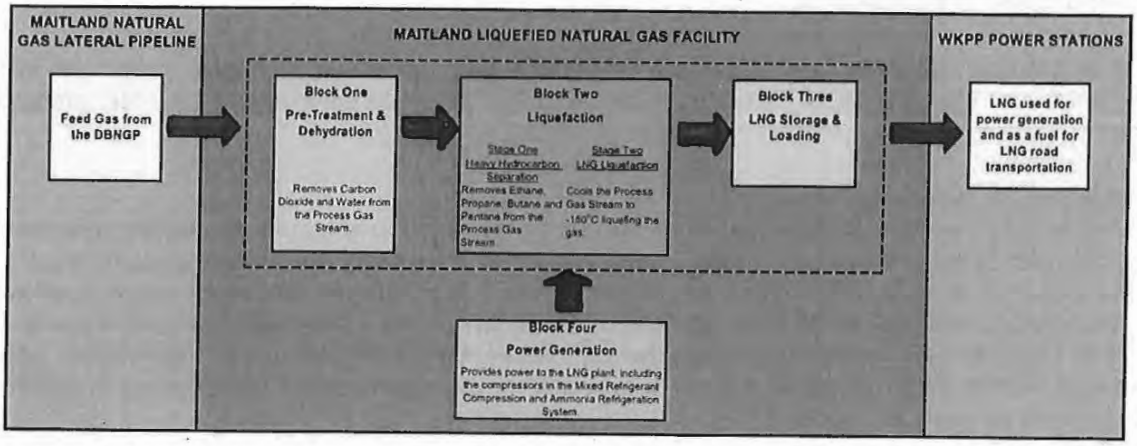


**Figure 1: LNG Process Overview**

**Table 2: Key Characteristics Table**

| Element | Description |
|---|---|
| ***General*** | |
| Proposal | Operate a high pressure gas pipeline and mini-LNG facility at the MIE. |
| Purpose | Provide LNG for four power stations in the West Kimberley region as part of the WKPP. |
| Life of the project | Approximately 20 years |
| Total site area including buffer | Approximately 9 hectares |
| Operational area | Approximately 3 hectares |
| Location | South east corner of the MIE |
| Land zoned as | Strategic Industrial as per Town Planning Scheme Number 8 |
| Closest sensitive receptor | Karratha Station 5 km south of the site. |
| ***Pipeline from DBNGP to LNG facility*** | |
| Natural gas supply point | Prior to 30 km marker on the DBNGP |
| Natural gas pipeline | 168.3 mm outside diameter; 6.4 mm nominal wall thickness, 3.2 km carbon steel underground pipeline from DBNGP to site; typical operating pressure of 8 MPa; gas temperature of 25ºC. |
| ***Mini LNG facility*** | |
| LNG production | LNG production capacity: 200 tonnes per day (tpd)<br>Natural gas imported to facility (with LNG production at 200 tonnes per day ): 224 tpd<br>Natural gas consumed on site (with LNG production at 200 tpd): 24 tpd |
| LNG storage | Vacuum insulated cryogenic above ground vessels<br>6 x 325 kL tanks |
| Power generation on site | 8.4 MW installed capacity comprised of three 2.8 MW Solar Centaur gas fired turbines.<br>Average annual operating load is approximately 40% of installed |

| Element | Description |
|---|---|
| | capacity.<br>One turbine will be a standby unit for emergency generation and during maintenance periods.<br>One diesel 0.5 MW unit for black start of facility. |
| Gaseous and other emissions (at final plant capacity) | Carbon monoxide: 117 tonnes per annum (tpa)<br>Nitrogen oxides: 385 tpa<br>Particulate matter: 18 tpa<br>Sulphur dioxide: 0.7 tpa |
| Greenhouse gas emissions from facility (at final plant capacity) | Approximately 32 000 tpa carbon dioxide equivalent. |
| Water consumption and supply | Up to 3 kL per day transported by road from Karratha. |

Additional support infrastructure at the facility includes: a workshop, administration building and laboratory. Figure 2 shows the layout of the facility identifying all the infrastructure at the facility.

In the original licence issued in 2007, EDL committed to reducing the NOx emissions, within 5 years of operation, to meet the Environmental Protection Authority Guidance Statement for Emissions of Oxides of Nitrogen from Gas Turbines No. 15 (guideline), of 90 $mg/m^3$. This guideline has since been withdrawn, however, EDL has been unable to meet their commitment due to:

- The gas turbines in use at site were relocated assets and not new at time of installation; and
- As turbines are not continually run at full load they would not benefit from retrofitting of NOx burner technology.

EDL have undertaken the following actions to reduce the concentration of NOx in emissions and any potential impact from the emissions:

- The stack height of 10 metres;
- Significant overhaul of turbine 3 completed in 2012; and
- Regular and ongoing maintenance of plant and equipment, including turbines.

NOx emissions were predicted to be 520 $mg/m^3$ at the start of the operations of the facility in 2007. These emissions have been reduced during the last five years of operations to 260$mg/m^3$ in March 2012.

EDL commissioned an Addendum Report to the Air Quality Modelling conducted by Pacific Air & Environment Pty Ltd in 2005, using the actual emissions data in the model. The results of the modelling confirm that no emission concentrations from the LNG plant are above the National Environment Protection (Ambient Air Quality) Measure (NEPM).

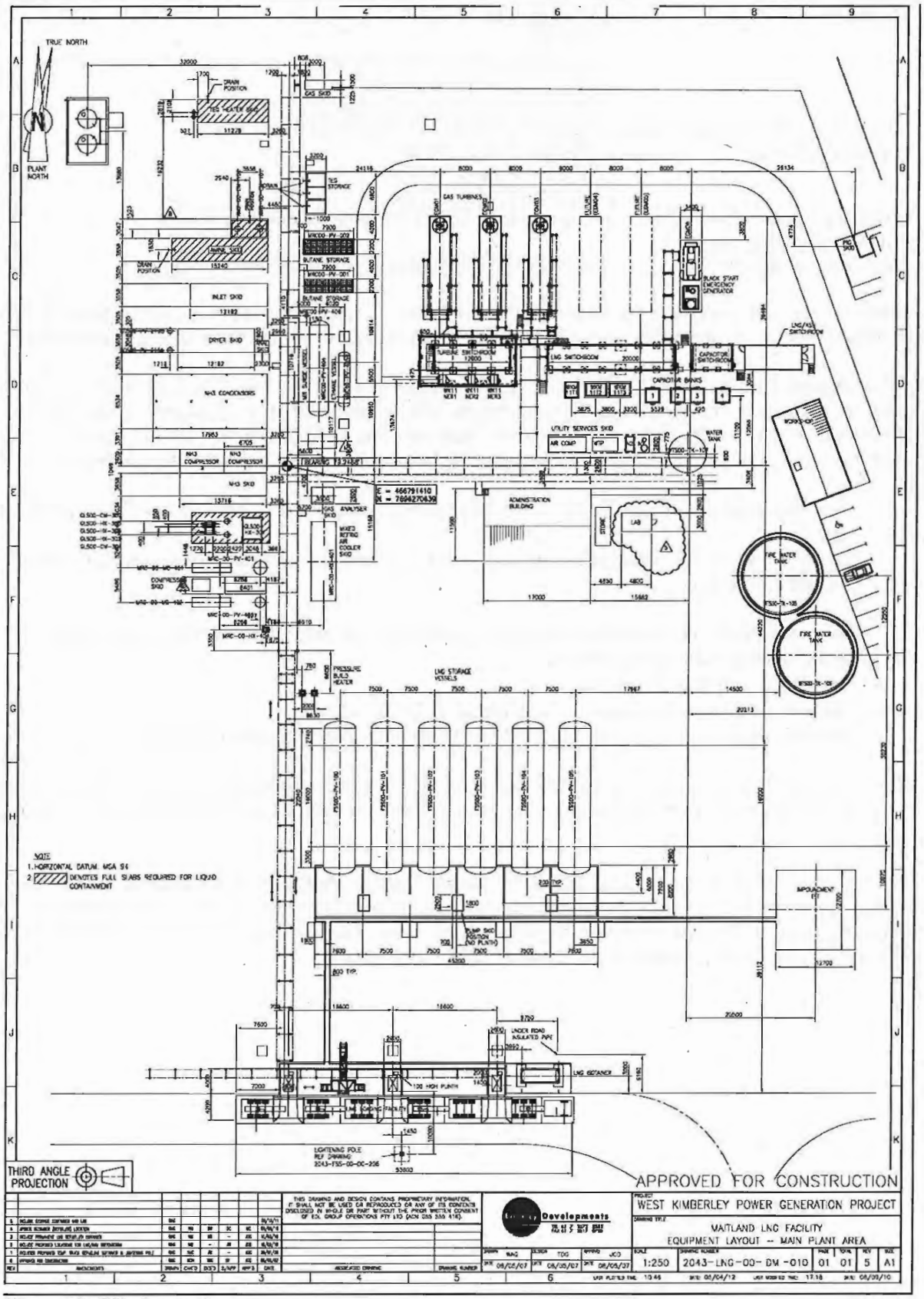


**Figure 2: Site Layout**

## 1.4 REGULATORY CONTEXT

### 1.4.1 Part IV *Environmental Protection Act 1986*, Environmental Impact Assessment

The LNG facility was referred to the Environmental Protection Authority (EPA) in 2004. The proposal was not formally assessed by the EPA under Part IV of the *Environmental Protection Act 1986* and, therefore, no Ministerial Conditions apply. The EPA concluded that the project could be appropriately regulated under a Part V works approval and licence.

### 1.4.2 Part V *Environmental Protection Act 1986*, Environmental Management

The LNG facility has been assessed as a "prescribed premises" under the Environmental Protection Regulations 1987 and requires a licence for gas refining activities (Category 34). A works approval was previously been issued to EDL for the construction of the facility, W4063/2004/1, and compliance documentation submitted to DEC.

A licence to operate the facility was granted in 12 July 2007 for a period of 5 years. The licence issued was a nil condition licence, which is due to expire on the 12 July 2012. A review of the licence was undertaken in June 2012 and relevant conditions added to the licence.

Inspection of the LNG facility conducted in June 2009 found the site to be in good condition, with only minor issues relating to the storage of hydrocarbons. It was noted that EDL had not submitted the results of the monitoring of NOx which they had committed to during the assessment of the licence. The results of the monitoring for 2009 were submitted to DEC and EDL have submitted monitoring results in subsequent years.

### 1.4.3 Other Environmental Protection Regulations

DEC will also administer additional regulations to regulate various activities associated with the LNG facility. These include;

- Environmental Protection (NEPM - NPI) Regulations 1998;
- Environmental Protection (Noise) Regulations 1997; and
- Environmental Protection (Unauthorised Discharges) 2004.

### 1.4.4 Other Decision Making Authorities' Legislation which applies

The on site storage of hydrocarbons and dangerous goods associated with the LNG facility is regulated by the following legislation:

- Explosive & Dangerous Goods (Dangerous Goods Handling & Storage) Regulations 1992;
- Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007;
- *Occupational Safety and Health Act 1984;* and
- Occupational Safety and Health Regulations 1996.

### 1.4.5 Local Government Authority

The LNG facility is located within the Shire of Roebourne.

## 2.0 STAKEHOLDER AND COMMUNITY CONSULTATION

### SUBMISSIONS RECEIVED DURING 21 DAY PUBLIC COMMENT PERIOD

The application for licence details for the LNG facility were advertised in The West Australian newspaper on 7 May 2012 as a means of advising stakeholders and to seek public comments. No submissions were received by DEC.

## 3.0 EMISSIONS AND DISCHARGES RISK ASSESSMENT

DEC considers that conditions should focus on regulating emissions and discharges of significance. Where appropriate, emissions and discharges which are not significant should be managed and regulated by other legislative tools or management mechanisms.

The following section assesses the environmental risk of potential emissions from the LNG facility. In order to determine the site's appropriate environmental regulation, an emissions and discharges risk assessment was conducted of these facilities using the environmental risk matrix outlined in Appendix A. The results of this are summarized in Table 3.

## Table 3: Risk Assessment and Regulatory Response Summary Table.

| Risk factor | Significance of emissions | Socio-Political Context of Each Regulated Emission | Risk Assessment | DEC Regulation (EP Act Part V) | EAR Reference | Other management (legislation, tools, agencies) |
|---|---|---|---|---|---|---|
| Air Emissions | **Emission significant – 3.**<br>*Point source:*<br>Operation of the facility's gas turbines are considered to be the most significant air emission from the site. The NOx emissions do not meet the current Protection of Environment Operations (Clean Air) Regulation 2010 guideline, however, this guideline is for systems with capacity of 30 MW or more. The EDL facility has 3 turbines with a combined capacity of only 7.9 MW, well below the guideline.<br><br>Results from sampling March 2012:<br>NOx 260 mg/m$^3$ (371% of guideline).<br><br>When the licence was issued in 2007, EDL committed to reducing the NOx emissions to the EPA Guidance Statement No. 15 for Emissions of Oxides of Nitrogen from Gas Turbines, (90mg/m$^3$), within 5 years of operation. While this guideline has been withdrawn, EDL have been unable to fulfil their commitment.<br><br>Following investigation it was found to be uneconomical to retrofit low NOx burners to the existing infrastructure. The turbines are maintained to ensure optimum performance and emissions. Emissions have been reduced from predicted emissions of 520 mg/m$^3$ to actual emission of 260 mg/m$^3$ during the last 5 years.<br><br>*Ambient*<br>EDL commissioned an addendum report to the air quality study conducted in 2005 as part of the original supporting documents for the facility. The report used the actual operating data to confirm compliance with the National Environment Protection (Ambient Air Quality) Measure (NEPM) standard.<br><br>The modelling assumed operation of all 3 turbines, however, only 2 turbines are operated at any time. One turbine is used as a backup for emergency periods and | **Low** socio-political concerns.<br>The nearest residence to the facility is Karratha Homestead (5km). | **D** - EIP's, other management mechanisms/ licence conditions (monitoring/ reporting)/ other regulatory tools. | LIC - Monitoring conditions relating to sampling and reporting on NOx and condition relating to reporting of flaring events. | N/A. | Environmental Protection (NEPM – NPI) Regulations 1998 for the reporting of NPI listed substances.<br><br>National Environment Protection (Ambient Air Quality) Measure.<br><br>Maitland LNG Facility Environmental Management Plan, Energy Developments, July 2011.<br><br>Protection of Environment Operations (Clean Air) Regulation 2010.<br><br>General provisions of the *Environmental Protection Act 1986.* |

| Risk factor | Significance of emissions | Socio-Political Context of Each Regulated Emission | Risk Assessment | DEC Regulation (EP Act Part V) | EAR Reference | Other management (legislation, tools, agencies) |
|---|---|---|---|---|---|---|
| | during maintenance. Estimated emissions from the flare and the TEG heater, although not significant, were also included in the updated modelling. The predicted ground level concentrations are at the site boundary.<br><br>**Emission significance – 3**<br>*NOx 1 hour average*<br>210 µg/m$^3$ (85% NEPM)<br><br>**Emission significance - 3**<br>*$NO_x$ Annual average*<br>42 µg/m$^3$ (68% NEPM)<br><br>**Emission Significance - 1**<br>*CO 8 hour average*<br>320 µg/m$^3$ (2.8% NEPM)<br><br>**Emission Significance - 3**<br>*$SO_2$ 1 hour average*<br>399 µg/m$^3$ (70% NEPM)<br><br>**Emission Significance - 1**<br>*$SO_2$ 24 hour average*<br>26 µg/m$^3$ (11% NEPM)<br><br>**Emission Significance - 1**<br>*$SO_2$ Annual average*<br>0.003 µg/m$^3$ (<1% NEPM)<br><br>Dispersion modelling based on stack sample data demonstrates that predicted ground level concentrations for CO, NOx and $SO_2$ are all within the NEPM standards. The highest relative impact is from the maximum hourly concentration of NOx which including the background concentration is at 85% of the NEPM.<br><br>EDL conduct annual stack monitoring from at least one turbine, ensuring that all three turbines are sampled and | | | | | |

| Risk factor | Significance of emissions | Socio-Political Context of Each Regulated Emission | Risk Assessment | DEC Regulation (EP Act Part V) | EAR Reference | Other management (legislation, tools, agencies) |
|---|---|---|---|---|---|---|
| | tested at least once in any five year period. The results are reported to DEC in the annual environmental report.<br><br>Air emissions are reported annually to the National Pollutant Inventory as required under the Environmental Protection (NEPM – NPI) Regulations 1998.<br><br>The flare operates with a small continuous pilot flame and is mainly used during periods of startup and shutdown. Excess fuel gas is also sent to the flare for safe disposal. The flare is smokeless in design. | | | | | |
| Dust emissions | **Emission significant – 1.**<br>There are no significant dust emissions from the operation of this facility. | **No** socio-political concerns. | **E** – No regulation, other management mechanisms. | LIC - No conditions. | N/A. | General provisions of the *Environmental Protection Act 1986.* |
| Odour emissions | **Emission significant – 1.**<br>There are no significant odour emissions from the operation of this facility. | **No** socio-political concerns. | **E** – No regulation, other management mechanisms. | LIC - No conditions. | N/A. | General provisions of the *Environmental Protection Act 1986.* |
| Noise emissions | **Emission significant – 1.**<br>Noise predictions have determined that noise emissions from the facility would be inaudible at the nearest sensitive receptor (Karratha Station Homestead), which is located over 5 km from the site.<br><br>Noise from the facility is minimised by the enclosure of the generator sets. EDL have committed to investigate any noise complaints received and conduct noise monitoring if the investigation identifies the need for monitoring and/or a noise survey.<br><br>No compliants have been received. | **No** socio-political concerns.<br>The nearest residence to the facility is Karratha Homestead (5km). | **E** – No regulation, other management mechanisms. | LIC - No conditions. | N/A. | General provisions of the *Environmental Protection Act 1986.*<br><br>Environmental Protection (Noise) Regulations 1997.<br><br>Maitland LNG Facility Environmental Management Plan, Energy Developments, July 2011. |
| Light emissions | **Emission significant – 1.**<br>There are no significant light emissions from the operation of this facility. | **No** socio-political concerns. | **E** – No regulation, other management mechanisms. | LIC - No conditions. | N/A. | General provisions of the *Environmental Protection Act 1986.* |

| Risk factor | Significance of emissions | Socio-Political Context of Each Regulated Emission | Risk Assessment | DEC Regulation (EP Act Part V) | EAR Reference | Other management (legislation, tools, agencies) |
|---|---|---|---|---|---|---|
| | The flare operates with a small continuous pilot flame and is mainly used during periods of startup and shutdown. Excess fuel gas is also sent to the flare for safe disposal. The flare is smokeless in design. | | | | | |
| Discharges to water | **Emission significant – 1.**<br>There are no discharges to water from the operation of this facility.<br><br>The facility is located approximately 7 km east of the Maitland River and groundwater level at the site is at least 2 metres below ground level. | No socio-political concerns. | E – No regulation, other management mechanisms. | Lic - No conditions. | N/A. | General provisions of the *Environmental Protection Act 1986.* |
| Discharges to land | **Emission significant – 1.**<br>Following rainfall events, water collected in bunded areas is visually inspected and if free of contaminants is pumped out and discharged into existing stormwater drainage. If bund water is contaminated it is collected by a licensed contractor. Clean water is discharged to land. | No socio-political concerns. | E – No regulation, other management mechanisms. | LIC - Standard stormwater conditions.<br><br>Condition relating to the Total Petroleum Hydrocarbon level in any stormwater discharged to the environment. | N/A. | Environmental Protection (Unauthorised Discharges) Regulations 2004.<br><br>General provisions of the *Environmental Protection Act 1986.*<br><br>Maitland LNG Facility Environmental Management Plan, Energy Developments, July 2011. |
| Solid / liquid wastes | **Emission significant – 1.**<br>Waste streams are segregated into hazardous/non-hazardous and recyclable/non-recyclable. Waste are managed and disposed of in a manner consistent with the most hazardous element of the waste stream. The options for disposal are:<br>• Non-hazardous and recyclable: removed from site and recycled;<br>• Non-hazardous and non-recyclable:removed offsite and disposed of at a licensed facility;<br>• Hazardous recyclable: removed from site by a licensed contractor for recycling at an approved facility; and | No socio-political concerns. | E – No regulation, other management mechanisms. | LIC - Standard condition relating to the storage of hydrocarbon material. | N/A. | Environmental Protection (Controlled Waste) Regulations 2004.<br><br>Environmental Protection (Unauthorised Discharges) Regulations 2004.<br><br>Maitland LNG Facility Environmental Management Plan, Energy Developments, July 2011.<br><br>General provisions of the *Environmental Protection Act 1986.* |

| Risk factor | Significance of emissions | Socio-Political Context of Each Regulated Emission | Risk Assessment | DEC Regulation (EP Act Part V) | EAR Reference | Other management (legislation, tools, agencies) |
|---|---|---|---|---|---|---|
| | • Hazardous and non-recyclable: removed off site by a licensed contractor for disposal at a licensed facility.<br><br>Prior to collection for offsite disposal, all waste is stored in a manner which minimises leaks, spills or other sources of discharge causing land contamination or discharge to stormwater drains or waterways. | | | | | |
| Hydrocarbon/ chemical storage | **Emission significant – 1.**<br>LNG, Ammonia and Amine solution are stored on site in accordance with EDL's Dangerous Goods Storage Licence (DGS021366).<br><br>Transport of chemicals and hydrocarbons are undertaken in accordance with the *Dangerous Goods (Transport) Act 1998.*<br><br>EDL routinely checks tanks, bund walls, valves etc and maintain spill and leak kits on site which are adequate for the first level of response to a spill or leak. Any leak or spill detected is contained and cleaned up as quickly as practicable with any contaminated material removed from site to an approved facility.<br><br>EDL stores hydrocarbons on site in accordance with:<br>• Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007; and<br>• AS 1940:2004 Storage and Handling of Flammable and Combustible Liquids. | No socio-political concerns. | E – No regulation, other management mechanisms. | LIC - Standard conditions relating to the storage of chemical/ hydrocarbon storage. | N/A. | Environmental Protection (Unauthorised Discharges) Regulations 2004.<br><br>Explosive & Dangerous Goods (Dangerous Goods Handling & Storage) Regulations 1992.<br><br>Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007.<br><br>AS 1940:2004 Storage and Handling of Flammable and Combustible Liquids.<br><br>*Dangerous Goods (Transport) Act 1998.*<br><br>Maitland LNG Facility Environmental Management Plan, Energy Developments, July 2011. |
| Native vegetation clearing | N/A. | N/A. | N/A. | N/A. | N/A. | General provisions of the *Environmental Protection Act 1986.*<br><br>Native Vegetation Clearing Permit (CPS 3567/1). |
| Contaminated site identification | The site has not been reported to DEC as a known or suspected contaminated site. | N/A. | N/A. | N/A. | N/A. | *Contaminated Sites Act 2003.* |

## 4.0 GENERAL SUMMARY AND COMMENTS

The EDL LNG facility is located in the MIE, approximately 20 km south-west of Karratha. The facility sources feed gas from the DBNG pipeline, which then undergoes processing prior to storage and export as LNG product. The LNG is transported to various power stations in the West Kimberley and used as a fuel source to replace older diesel fired facilities.

The licence was first issued in 2007 as a nil condition licence and is due to expire on 12 July 2012. The licence has been reviewed prior to reissue and conditions added, which includes, standard management of stormwater and hydrocarbons on site, reporting conditions and air quality monitoring conditions.

As shown in Table 3, emissions and discharges related to the operation of the facility are considered a low risk to the environment and if managed correctly should not result in significant impacts to the environment.

The facility is also subject to the general provisions of the *Environmental Protection Act 1986* relating to the causing and reporting of pollution and will be subject to inspections by DEC officers.

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# APPENDIX A: EMISSIONS AND DISCHARGES RISK ASSESSMENT MATRIX

## Table 4: 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 Percentil | >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 5: 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 DEC using the DEC "Officer's Guide to Emissions and Discharges Risk Assessment" May 2006.

## Table 6: 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