



Queensland Government

**Assessment Report under the
*Environmental Protection Act 1994***

on the

Environmental Impact Statement

for the

**Gladstone LNG Project – Fisherman’s
Landing**

proposed by

Gladstone Liquefied Natural Gas Pty Ltd

14 April 2009

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1 Introduction

This report provides an evaluation of the Environmental Impact Statement (EIS) process pursuant to Chapter 3 of the *Environmental Protection Act 1994* (EP Act) for the Gladstone LNG Project – Fisherman's Landing Project proposed by Gladstone LNG Pty Ltd (GLNG). The Department of Environment and Resource Management (DERM), formerly the Environmental Protection Agency (EPA), as the administering authority of the EP Act, coordinated the EIS process. This assessment report has been prepared pursuant to Sections 58 and 59 of the EP Act.

The objective of this assessment report is to:

- (a) address the adequacy of the EIS in addressing the final terms of reference (TOR), and the adequacy of the draft environmental management plan (EM plan);
- (b) summarise key issues associated with the potential adverse and beneficial environmental, economic and social impacts of the Gladstone LNG Project – Fisherman's Landing, and the management, monitoring, planning and other measures proposed to minimise any adverse environmental impacts of the project; and
- (c) make recommendations on the suitability of the project to proceed and where so, to make recommendations on necessary conditions for any approval required for the project.

Section 58 of the EP Act lists the criteria that the EPA must consider when preparing an EIS assessment report, while section 59 of the Act states what the content must be.

In summary, this assessment report addresses the adequacy of the EIS in addressing the final terms of reference (TOR), and the suitability of the draft environmental management plan (EM plan). It also discusses in some detail those issues of particular concern that were either not resolved or require specific conditions for the project to proceed.

The giving of this EIS assessment report to the proponent completes the EIS process under the EP Act.

1.1 Project details

Gladstone LNG Pty Ltd (GLNG), which is a subsidiary of the publicly listed Australian company Liquefied Natural Gas Ltd, proposes to develop a mid-scale liquefied natural gas (LNG) plant at Fisherman's Landing Wharf (FLW) near Gladstone. Coal seam gas (CSG) would be sourced from gas fields in the Bowen and Surat basins. The proposal has an expected life of 25 years and the first stage would produce up to 1.6 million tonnes of LNG per year. A proposed second stage would double the capacity within three years of Stage 1. The EIS addressed both proposed stages.

Carbon dioxide would be removed from the incoming CSG by an amine gas treating process, called the "amine package". The amine package is a proven technology used extensively in the gas and petroleum industries. Amine used in the process would be regenerated on site for reuse. Water in the gas would initially be reduced by chilling to cause condensation, and then further reduced by molecular sieves. Water condensate would be treated in the Advanced Water Treatment Package and reused on-site in the amine package and power generation processes. The processed gas would be cooled to -160 °C and stored at low pressure in a

200,000m³ cryogenic LNG storage tank. A membrane tank is the proponent's preferred option for storing the LNG.

Wharf loading facilities at FLW No. 5 would be upgraded to accommodate LNG carrier shipping. A cryogenic loading line would connect the LNG storage tanks to a set of loading arms mounted on the Wharf No. 5 extension.

This EIS assessment report covers only Stages 1 and 2 of the Gladstone LNG project on Fisherman's Landing. The sourcing of the coal seam gas, the delivery pipeline, and modification of the wharf loading facilities have or will be addressed by other assessment and approval processes.

1.2 Approvals

Table 1 The following approvals are required for the Gladstone LNG Project – Fisherman's Landing:

Approvals	Legislation
Environmental authority (petroleum activities)	<i>Environmental Protection Act 1994</i> – ERA 10 (Department of Environment and Resource Management)
Petroleum facility licence	<i>Petroleum and Gas (Production and Safety) Act 2004</i> (Mines and Energy, Department of Employment, Economic Development and Innovation)
Development approvals (DAs):	<i>Integrated Planning Act 1997</i> (Gladstone Ports Corporation is assessment manager for development on strategic port land and within strategic port land tidal area)
<ul style="list-style-type: none"> - Major hazard facility 	<i>Dangerous Goods Safety Management Act 2001</i> (concurrence agency: Hazardous Industries and Chemicals Branch – Department of Justice and Attorney-General)
<ul style="list-style-type: none"> - Development approval for tidal works/development approval for works in a coastal management district. 	<i>Coastal Protection and Management Act 1995</i> (concurrence agency: DERM)
<ul style="list-style-type: none"> - Development approval for the removal and destruction of marine plants. 	<i>Fisheries Act 1994</i> (concurrence agency: Primary Industries and Fisheries, Department of Employment, Economic Development and Innovation)

1.3 Impact assessment process

1.3.1 The EIS process

The EIS for the Gladstone LNG Project – Fisherman's Landing was conducted under Chapter 3 of the EP Act. The EIS process was initiated by GLNG on 10 January 2008 by application to the former EPA to prepare a voluntary EIS under section 70 of the EP Act. The EPA approved the application to undertake a Voluntary EIS on 11 January 2008.

The EPA issued a notice of publication of the draft TOR to GLNG on 6 February 2008. The EPA placed a public notice on its website on 8 February 2008 and advertised in the Courier-Mail and the Gladstone Observer on 9 February 2008. The draft TOR was available for public comment from 11 February 2008 to 25 March 2008. GLNG issued copies of the public notice to affected and interested persons.

Sixteen submissions were received by the EPA on the draft TOR within the public comment period. These comments, together with one from the EPA, were forwarded to GLNG on 8 April 2008 to which GLNG responded on 28 April 2008. The EPA considered all comments received on the draft TOR and GLNG response prior to issuing the final TOR on 28 May 2008.

GLNG submitted the draft EIS on 6 August 2008 to the EPA for review prior to public notification. The EPA compared the draft EIS to the final TOR. On 18 September 2008 the EPA issued to GLNG a notice of decision to proceed with the draft EIS. The public notification and submission period was set at 30 business days.

A public notice was placed on the EPA's website on 26 September 2008 and advertised in The Courier Mail and the Gladstone Observer on 27 September 2008. The draft EIS was available for public comment from 29 September 2008 to 7 November 2008. GLNG also issued copies of the public notice to affected and interested persons.

Sixteen submissions were received by the EPA on the draft EIS within the submission period. Submissions were received from fifteen State government departments and agencies, and one from a non-government organisations. These submissions, together with a submission from the EPA were forwarded to GLNG for consideration and response on 19 December 2008. At the proponent's request the period for the proponent to submit a response to the comments on the EIS was extended on 18 December 2008 to the 16 January 2009. However, before the due date the proponent provided a response to submissions (on 24 December 2008). Copies of the response to submissions were distributed for review to those members of the advisory body who had made a submission on the draft EIS.

Twelve responses were received on the proponent's response to submissions. Two respondents requested further information or clarification of issues. As a result a request for further information was issued on 2 February 2009 together with a notice under s555 of the EP Act extending the decision under s56A of the EP Act until 27 February 2009 in order to allow the proponent sufficient time to provide the required information as part of the EIS.

On 13 February 2009, GLNG provided response to supplementary questions put by Queensland Health regarding the Air Quality Impact Assessment. Then on 16 February 2009 GLNG provided further supplementary information.

On 25 February 2009, GLNG provided an updated statement of commitments for managing environmental impacts, which they further updated on 19 March 2009.

The EPA decided under s56A of the EP Act on 27 February 2009 that the submitted EIS should proceed under Division 5 (EIS assessment report) and Division 6 (Completion of process). A notice of the decision to allow the submitted EIS to proceed was issued on 27 February 2009.

The former EPA, now the Department of Environment and Resource Management (DERM), in the preparation of this EIS assessment report, considered submissions and comments from members of the advisory body and other interested parties made at all stages of the EIS process. This EIS assessment report will be available on the DERM website (www.derm.qld.gov.au).

1.3. Consultation program

Public consultation

In addition to the statutory requirements for public notification of the TOR and draft EIS and identification of interested and affected parties, the proponent undertook community consultation with affected landowners and government agencies during the public submission period of the draft EIS. The proponent also circulated information on the Gladstone LNG Project – Fisherman's Landing and the EIS process to the community.

Advisory Body

The former EPA invited the following organisations, as they were at the time, to assist in the assessment of the TOR and EIS by participating as members of the advisory body for the Gladstone LNG Project – Fisherman's Landing:

- Department of Mines and Energy (DME);
- Department of Communities (DoC);
- Department of Emergency Services (DES);
- Hazardous Industries and Chemicals Branch (HICB), Department of Employment and Industrial Relations;
- Department of Housing (DoH);
- Department of Main Roads (DMR);
- Department of Natural Resources and Water (DNRW);
- Department of Primary Industries and Fisheries (DPIF);

- Queensland Treasury (QT);
- Queensland Police Service (QPS);
- Gurang Land Council (GLC);
- Gladstone Regional Council* (GRC);
- Queensland Health (QH);
- Queensland Transport (QT);
- Department of Infrastructure and Planning (DIP);
- Gladstone Ports Corporation (GPC);
- Department of Education, Training and the Arts (DETA);
- Maritime Safety Queensland (MSQ);
- Gladstone Regional Council Airport Services (GRCAS)
- Capricorn Conservation Council (CCC);
- Fitzroy Basin Association (FBA);

Advisory body briefings were held in Rockhampton, Gladstone and Brisbane of the project site during the EIS public submission period.

* Gladstone Regional Council was formerly Gladstone City Council and the Calliope Shire Council.

Public notification

In accordance with the statutory requirements, advertisements were placed in The Courier-Mail and the Gladstone Observer to notify the availability of the draft TOR and draft EIS for review and public comment as stated in Section 1.3.1 above. In addition, notices advising the availability of the draft TOR and the draft EIS for public comment were displayed on the EPA website.

The draft TOR and draft EIS were placed on public display at the following locations during their respective public notification/submission periods:

- EPA Website (draft TOR and IAS only);
- EPA Customer Services Centre, 160 Ann Street, Brisbane;
- EPA Central Coast Region Office, 136 Goonoon Street, Gladstone;
- Gladstone Library; and
- WorleyParsons, Brisbane (copies of the draft EIS could also be purchased).

1.3.3 Environment Protection and Biodiversity Conservation Act 1999

On 9 January 2008, the proposal to construct and operate the Gladstone LNG Project – Fisherman's Landing was referred (EPBC referral 2008/3954) under section 68 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to the then Commonwealth Department of the Environment and Heritage (now the Commonwealth Department of the Environment, Water, Heritage and the Arts). On 1 February 2008, it was declared to be not a controlled action under section 75 of the EPBC Act and consequently the project does not require assessment or approval by the Commonwealth under the EPBC Act.

2 Matters considered in the EIS assessment report

Section 58 of the EP Act requires, when preparing this EIS assessment report, the consideration of the following matters:

- (a) the final TOR for the EIS;
- (b) the submitted EIS;
- (c) all properly made submissions and any other submissions accepted by the chief executive;
- (d) the standard criteria;
- (e) another matter prescribed under a regulation.

These matters are addressed in the following subsections.

2.1 The final TOR

The final TOR document, issued on 28 May 2008, was considered when preparing this EIS assessment report. While the TOR were written to include all the major issues associated with the project that were required to be addressed in the EIS, they were not exhaustive, nor were they to be interpreted as excluding all other matters from consideration.

Where matters outside of those listed in the final TOR were addressed in the EIS, those matters have been considered when preparing this EIS assessment report.

2.2 The submitted EIS

The "submitted EIS" was considered when preparing this EIS assessment report. The "submitted EIS" comprised the:

- (i) draft EIS that was publicly released on 29 September 2008;
- (ii) the response to submissions received by the EPA on 24 December 2008 that was provided to relevant advisory body members;
- (iii) response to supplementary questions from Queensland Health regarding the Air Quality Impact Assessment received 13 February 2009;
- (iv) the supplementary information received by the EPA on 16 February 2009; and
- (v) updated statements of commitments received on 25 February 2009 and 19 March 2009.

2.3 Properly made submissions

The former EPA received a total of sixteen submissions on the submitted draft EIS, all of which were properly made. There has been other correspondence from stakeholders regarding the response to submissions, supplementary information and updated statements of commitments. All submissions and other comments made by stakeholders on the EIS documents were considered when preparing this EIS assessment report.

2.4 The standard criteria

Section 58 of the EP Act requires that, among other matters, the standard criteria listed in Schedule 3 of the EP Act must be considered when preparing the EIS assessment report. The standard criteria are:

- (a) *the principles of ecologically sustainable development as set out in the National Strategy for Ecologically Sustainable Development;*
- (b) *any applicable environmental protection policy;*
- (c) *any applicable Commonwealth, State or local government plans, standards, agreements or requirements;*
- (d) *any applicable environmental impact study, assessment or report;*
- (e) *the character, resilience and values of the receiving environment;*
- (f) *all submissions made by the applicant and submitters;*
- (g) *the best practice environmental management for activities under any relevant instrument, or proposed instrument, as follows—*
 - (i) *an environmental authority;*
 - (ii) *an environmental management program;*
 - (iii) *an environmental protection order;*
 - (iv) *a disposal permit;*
- (h) *the financial implications of the requirements under an instrument, or proposed instrument, mentioned in paragraph (g) as they would relate to the type of activity or industry carried out, or proposed to be carried out, under the instrument;*
- (i) *the public interest;*
- (j) *any applicable site management plan;*
- (k) *any relevant integrated environmental management system or proposed integrated environmental management system;*

(i) *any other matter prescribed under a regulation.*

The EPA has considered the standard criteria when assessing the project.

2.5 Prescribed matters

For this project, there are no other matters prescribed under a regulation that required consideration.

3 Adequacy of the EIS in addressing the TOR

The submitted EIS adequately addressed the TOR. This section of the EIS assessment report discusses the main issues and associated commitments by the proponent, and makes recommendations about conditions to be included in approvals for the project. Draft conditions are provided in section 4 of this report.

3.1 Air quality

The proponent adequately addressed issues raised during the EIS process, including greenhouse gas abatement, health issues from volatile organic compounds (VOCs) and details about potential air pollutants from the gas turbines and flare. The proponent provided a requested health risk assessment on volatile organic compounds (VOCs) in accordance with enHealth guidelines, showing a very low risk. Queensland Health was satisfied with the evidence provided by the proponent.

Some gas will be burned on-site in turbines to power other project processes. Gas flaring is proposed to occur only during infrequent start-up, shut-down, upset and emergency operations. The duration of flaring is expected to be only a few hours a year.

Measures will be implemented in the design of the plant to reduce fugitive and greenhouse gas (GHG) emissions including aero-derivative gas turbines with low NO_x burners; waste heat recovery system on gas turbines exhausts, for process heat duties and power generation (steam); vapour recovery for the LNG storage and vapour return line for the LNG loading arms.

There are no potentially significant impacts due to emissions of sulfur oxides because sulfur is expected to be undetectable in the incoming gas. The turbine exhaust and flares of the project will emit relatively low amounts of nitrogen oxides, PM₁₀ and other contaminants that could affect human health or impact on the environment. All ground level concentrations for potentially harmful contaminants that could result from the project are predicted to be below National Environment Protection Measures limits. The project is expected to have a relatively small incremental impact on the Gladstone air shed.

Subsequent to the public review of the EIS, the proponent provided, at the request of Queensland Health, a health risk assessment on volatile organic compounds (VOCs) in accordance with enHealth guidelines. The assessment showed a very low risk of impacts on health, and Queensland Health was satisfied with the evidence provided by the proponent.

The most significant emission to air will be carbon dioxide from the exhaust of gas burning in the turbines and that removed from the incoming coal seam gas. Carbon dioxide (CO₂) would not be directly harmful to health or the environment, but is a greenhouse gas whose emissions should be minimised. The proponent has chosen to use an Optimised Single Mixed Refrigerant (OSMR) process, which is able to use recycled heat from the gas turbines to improve the efficiency of the liquefaction process, and as a consequence reduces greenhouse emissions.

To mitigate the residual potential impacts of carbon dioxide, the proponent has made commitments in the EIS including:

- developing a greenhouse management plan (GHMP);
- investigating the potential for CO₂ beneficial reuse during detailed design and annually during operation;
- and annually reviewing the GHMP to provide a process of continual improvement in reducing greenhouse gas emissions.

It is recommended that the air conditions B1 to B15 in section 4 be included in the draft environmental authority. These conditions cover the prevention of nuisance from air emissions, emissions emitted to the atmosphere, monitoring, flare related conditions and greenhouse gas emissions.

3.2 Water resources

3.2.1 Stormwater

The proponent proposes to divert stormwater on site through Stormwater Quality Improvement Devices (SQIDs) such as oil and grit interceptors, and detention basins that will act as sediment traps during construction. Water passing through the SQIDs would be discharged into Port Curtis. The proponent also proposes to use some of the captured stormwater on site for such purposes as dust suppression and process water. A stormwater quality monitoring program is to be developed and implemented prior to construction.

The Gladstone LNG – Fisherman's Landing site is outside the Calliope Water Resource Plan area and there are no restrictions on the taking of overland flow within the site.

The stormwater discharge points will require a development approval for tidal works within the coastal management district under the *Coastal Protection & Management Act 1995*.

It is recommended that the water management conditions C1 to C10 in section 4 be included in the draft environmental authority. These conditions cover the release of stormwater to Port Curtis, monitoring of water, ensuring released waters are free from contaminants, cleaning up any spillages and maintaining the stormwater management devices.

3.2.2 Ground water

The EIS was not able to provide the level of detailed information on groundwater requested by the TOR. At the time of the groundwater investigation, the proponent was unable to undertake a full ground water monitoring due to the site being reclaimed and unstable for ground water monitoring bores. No significant groundwater impacts were identified from the limited groundwater analysis that was undertaken.

However, as the site is reclaimed and surrounded on three sides by Port Curtis, and as there are no affected users, groundwater is not a major issue and only relevant to any groundwater formed on site and connected to the marine environment. Groundwater monitoring is adequately addressed in the draft EM plan included in the EIS, and the proponent has committed to developing and implementing a groundwater monitoring program.

3.3 Noise Issues

A noise modelling assessment was conducted assuming that the plant would be operating at 100% capacity and 24 hours a day and which considered the cumulative impacts of noise from existing noise sources. Noise from the plant included noise from the flares and low frequency noise from the turbines. The noise component from the plant was found to be below limits derived in accordance with the ecoaccess guideline '*Planning for noise control*', which would satisfy the requirements of the Environmental Protection (Noise) Policy 2008.

It is recommended that the noise conditions D1 to D8 in section 4 should be included in the draft environmental authority. These conditions would require that the proponent:

- meet noise limits on the plant at noise sensitive places and commercial places including low frequency noise;
- take appropriate measures to reduce noise impacts;
- follow up on any noise complaints; and
- when required, undertake noise monitoring from the plant.

Ambient noise due to industrial sources in the neighbourhood is relatively high and hence it will be unlikely that an accurate measurement of the noise emitted from the plant can be made at the nominated noise sensitive places. The proponent will need to undertake alternative procedures, such as noise measurements at closer locations followed by noise predictions, to demonstrate compliance with the noise limits in the conditions recommended in section 4.

3.4 Waste

The Gladstone LNG – Fisherman's Landing plant would produce the waste streams, and use the disposal methods, listed in Table 2.

Apart from the reverse osmosis concentrate (ROC), most wastes will be released to the atmosphere or recycled. As noted above in section 3.1 (Air quality), the proponent has made commitments to using technology that will reduce gaseous emissions or re-use waste heat. Where further gains may be achieved, the proponent has made commitments in the EIS to mitigating the potential impacts of waste disposal, which include:

- Development of a waste management plan based on the waste hierarchy.
- Undertaking a ROC disposal study for the Advanced Water Treatment Plant (AWTP). This study will review the influent sources and quality into the AWTP, estimate the quantity and quality of the ROC, identify monitoring requirements and determine the appropriate ROC disposal procedures.

Table 2 Gladstone LNG – Fisherman's Landing waste streams and disposal methods

Waste stream	Source	Disposal method
Reverse osmosis concentrate (ROC)	Advanced Water Treatment Plant	To be taken off site by a regulated waste transporter. Proponent to undertake ROC disposal study to examine potential reuse options.
Exhaust gases	Gas turbines	Released to atmosphere.
Flaring gases	Flare relief systems.	Released to atmosphere. Flaring will only occur infrequently.
Fugitive emissions including GHG emissions	Processing facilities of the Plant.	Released to atmosphere.
Heat	Gas turbines	Waste heat recovery for process use and power generation (steam generators).
Water separated from the incoming gas	Inlet Filter Separators F-201 and F-203.	Separated water will be directed to the advance water treatment plant for feedback into the amine package.
Carbon dioxide separated from the incoming gas	Amine package of the plant.	Released to atmosphere. Proponent to investigate capture and reused options.
Sewage	On-site toilet facilities.	Septic system. Residual waste to be taken off site by a regulated waste transporter.

It is recommended that the draft environmental authority contain the waste conditions E1 to E6 in section 4. These conditions cover the proper handling and disposal of all waste, the record keeping for regulated waste and ensuring all regulated waste is removed off site for proper disposal by a licensed waste contractor.

3.5 Acid sulfate soils

The EIS was not able to provide the level of detailed information on acid sulfate soils (ASS) requested by the TOR. However, analysis from the limited ASS investigation indicated that there is a low potential for ASS to be present in the material used to reclaim the site.

While the risk of impact from disturbance of ASS appears to be low, the proponent needs to meet their commitment made in the EIS to complete an acid sulfate soils investigation and develop a subsequent management plan in accordance with the *Guideline for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland (1998)* and discuss the outcomes with DERM. This ASS investigation is planned to be undertaken during the detailed design phase.

It is recommended that the draft environmental authority include the ASS conditions F4 and F5 in section 4. These conditions include conducting an ASS investigation and managing any ASS to prevent contaminants entering Port Curtis.

3.6 Maritime safety

Maritime safety issues were raised and these were primarily related to: the exclusion and buffer zones; related infrastructure requirements; the proximity of the Fisherman's Landing site to other port users; the impact on LNG vessels in transit to the berth on other port users; and their associated opportunity costs.

The proponent is committed to completing port simulation modelling and addressing the issues identified as part of the simulation work. In particular, the proponent must meet their commitments in the EIS including:

- undertaking further port simulation exercises in consultation with other industry participants, including Maritime Safety Queensland (MSQ) and Gladstone Ports Corporation (GPC);
- working with MSQ to facilitate the preparation of an appropriate vessel transit plan with information developed within the various proposed ship simulation exercises that are to be run in conjunction with the LNG industry, Regional Harbour Master, MSQ and GPC;
- negotiating with MSQ payment of a fair and equitable share of the cost of upgraded systems (including electronic aids to navigation, such as pilot positioning units (PPUs)) in order to ensure safety of LNG shipping in the port;
- consulting with AQIS regarding the development of quarantine requirements for the project as part of the project development; and
- conducting a risk analysis covering safety, possible marine incidents and emergencies, threat scenarios and ship sourced pollution.

It has been agreed with MSQ that the scope of the risk analysis will include:

- transit of empty LNG carriers from the Pilot boarding ground at port limits to the Fisherman's Landing berth;
- transit of loaded LNG carriers from Fisherman's Landing berth to the Pilot boarding ground at port limits;
- all activities of the LNG carrier during the period within the port including bunkering, stores loading, berthing, loading, un-berthing and transit through the port;
- the physical environment associated with the activities within the port (channels, tides, weather, etc);
- other users of the port (other ships, recreational vessels, etc); and
- security issues associated with the loading and transit.

3.7 Operational health and safety

The Gladstone LNG – Fisherman's Landing plant will be a major hazard facility regulated under the *Dangerous Goods Safety Management Act 2001*. The site will require a development permit for a material change of use for a major hazard facility under the *Integrated Planning Act 1997* (IPA). As this EIS process under the EP Act cannot be used for making a decision under IPA, it will be necessary for the proponent to obtain the necessary development permit through the Integrated Development Assessment System (IDAS). However, the EIS reports could be used as supporting information for the IDAS application.

The proponent's currently preferred option for the LNG storage tank is to use a membrane tank design. Further evidence is needed to demonstrate that membrane tanks are acceptable to the Hazardous Industries and Chemicals Branch (HICB), and that the risks are contained on-site and would not affect adjoining uses.

The proponent has made commitments in the EIS which include: conducting a detailed risk assessment on the membrane tank for storage of LNG; and comparing the risks of a full containment tank (nickel steel with concrete outer) with those of a membrane tank. The comparative study would need to confirm that a membrane tank poses an acceptable and equivalent level of overall risk to a full containment tank. Detailed consultation on the outcomes of this comparative study will be conducted with the Department of Employment, Economic Development and Innovation (DEEDI), the Hazardous Industries Chemicals Branch (HICB) of the Department of Justice and Attorney General, and Gladstone Ports Corporation (GPC). Should the comparative study and consultation demonstrate that the risks associated with a membrane tank are significantly greater than those of a full containment tank, to the satisfaction of DEEDI, HICB and GPC, then the proponent agrees to:

- amend the membrane tank design for LNG storage and have the consultant reassess the risks compared to a full containment tank and submit a revised comparative study for review by DEEDI, HICB and GPC; and
- should the revised comparative study still fail to demonstrate that a membrane tank poses an acceptable and equivalent level of overall risk compared to a full containment tank then, GLNG will (i) consider using an alternative tank design, which shall be subject to the same comparative study and consultation process as membrane tanks (as above) or (ii) proceed with a full containment tank.

Furthermore, the proponent needs to meet their commitment of completing a detailed quantified risk assessment (QRA) in support of their major hazard facility application. Additional reports and management plans are to be developed in parallel with the quantifiable QRA that include: safety operating plans, safety management plans and emergency response plans. The additional management plans should be completed as soon as possible and be developed in consultation with the relevant agencies including Queensland Fire and Rescue Service, Queensland Police Services, DEEDI, GPC, MSQ and HICB, to support development approval applications for the proposal.

3.8 Social impacts

The EIS stated that the workforce will be up to 32 permanent staff during operation and there will be 120 staff on average during construction. In comparison, the Gladstone region has a labour force of 23,105 persons. Issues raised and addressed by the proponent in the EIS included:

- increased housing rental prices, alcohol & drug misuse, police resources and the influx of migrant workers; and
- how economic benefits can be better distributed to: Aboriginal & Torres Strait Islander peoples, people with disabilities & other disadvantaged groups including youth unemployed, single parents and women.

Due to the relative scale of the project, it is not likely to have significant social impacts from direct employment effects.

Nevertheless, the proponent has made commitments in the EIS to mitigating social impacts including:

- consulting with GRC, Department of Communities and Department of Housing to identify the most appropriate funding projects and/or programs to assist in meeting community needs that may relate to, or be impacted by, the project;
- initially contributing a minimum of \$120,000 into social infrastructure projects upon commencement of construction of the project; and
- contributing of a minimum of \$25,000 a year for social infrastructure projects/programs for the duration of the operation of the project.

3.9 Roads impacts

The proponent provided information on expected volumes and composition of materials to be brought to the site and their potential contribution to traffic on the road network. The overall impact of the proposal on the surrounding road network is not expected to be large as the main resource inputs to the development will be brought by sea to the existing marine offloading facility, resulting in minimal heavy vehicle road traffic. Nevertheless, further work needs to be undertaken to determine the project's impacts on the operational safety and efficiency at key intersections.

The proponent has made commitments in the EIS to mitigate impacts on traffic. The commitments include completion of an intersection traffic analysis on the Gladstone-Mt Larcom/Landing Road intersections and the access roundabout to the Rio Tinto Facility. The analysis will determine the project's likely road impacts and recommend appropriate mitigation strategies. To ensure professional standards are maintained, the analysis must be undertaken by a traffic engineer/consultant (registered with the Board of Consulting Engineers Queensland) in consultation with Department of Transport and Main Road (T&MR) district officers. Furthermore the proponent commits to mitigating project impacts identified in the intersection traffic analysis prior to the commencement of construction and maintaining the safety and efficiency of the State-controlled road network.

3.10 Aviation issues

Projects such as the Gladstone LNG – Fisherman's Landing proposal have the potential to impact on aviation safety due to plumes of gas emitted from stacks or flares. To ensure adequate safety the plumes must disperse to fall below certain velocities at certain altitudes.

Gladstone Regional Council Airport Services (GRCAS) has requested that the average vertical plume velocities from the Gladstone LNG – Fisherman's Landing plant should be less than 4.3m/s at and above an altitude of 610m. The proponent has committed to designing the plant to meet the requested average vertical plume velocities during normal operations. The proponent also advised that the average vertical velocities of the plume from the flare during emergency event flaring are unlikely to be exceed the required safety threshold. However, further modelling of the flare plume discharge is needed to confirm it will be below the threshold. Should the vertical plume velocities exceed the threshold, approval from Civil Aviation Safety Authority (CASA) would be required to extend the danger zone for affected airspace.

The proponent has made commitments to mitigating impacts on aviation safety, including:

- undertaking modelling of flare plume discharge to the satisfaction CASA; and
- if required, obtain an approval from CASA to extend the danger zone (D722) for affected airspace prior to operation of the facility.

4 Recommendations for conditions for any approval

It is recommended that the following conditions, at least, be included in the environmental authority for the project together with others the administering authority may decide are necessary or desirable in accordance with s309Z of the EP Act.

SCHEDULE A GENERAL CONDITIONS

PREVENT AND/OR MINIMISE LIKELIHOOD OF ENVIRONMENTAL HARM

- (A1) This authority does not authorise environmental harm unless a condition contained within this authority explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.
- (A2) In carrying out petroleum activities the holder of this authority must prevent and / or minimise the likelihood of environmental harm being caused.

MAINTENANCE OF MEASURES, PLANT AND EQUIPMENT

- (A3) The holder of this authority must:
- a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this authority; and
 - b) maintain such measures, plant and equipment in a proper and efficient condition; and
 - c) operate such measures, plant and equipment in a proper and efficient manner.
- (A4) All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this authority must be calibrated, appropriately operated and maintained.

- (A5) The holder of this authority must ensure that daily operation and maintenance of all plant and equipment relating to the authorised petroleum activities are carried out by suitability qualified, competent and experienced person(s).
- (A6) No change, replacement or alteration of any plant or equipment is permitted if the change, replacement or alteration increases the risk of environmental harm from the petroleum activities.
- (A7) All analyses and tests required to be conducted under this authority must be carried out by a laboratory that has NATA certification for such analyses and tests, except as otherwise authorised by the administering authority.

ENVIRONMENTAL MANAGEMENT PLAN

- (A8) From commencement of this authority, an environmental management plan (EM Plan) must be implemented. The EM Plan must identify all sources of actual or potential environmental harm, including but not limited to the actual and potential release of all contaminants, the potential impact of these sources, and the actions that must be taken to prevent the likelihood of environmental harm being caused. The EM Plan must also provide for its regular review, and 'continuous improvement' in the environmental performance of the activities that are carried out on the site.

The EM Plan must address the following matters:

- a) identification of environmental issues and potential impacts;
 - b) environmental commitments - a commitment by the holder of this approval to achieve specified and relevant environmental goals;
 - c) control measures for routine operations to prevent or minimise environmental harm;
 - d) contingency plans and emergency procedures for non-routine situations to prevent or minimise environmental harm;
 - e) organisational structure showing how responsibility for environmental management is accounted for in the organisation;
 - f) an effective communication system for environmental management goals, control measures and contingency plans;
 - g) the regular and emergency monitoring of contaminant releases;
 - h) the conduct of environmental impact assessments;
 - i) staff training in environmental management policies and practices;
 - j) record keeping; and
 - k) periodic review of environmental performance, and continual improvement.
- (A10) The holder of this authority must develop, within 3 (three) months from the date of this authority, and implement a greenhouse gas reduction strategy for the petroleum project. The strategy must address, but not necessarily be limited to:
- a) the company's policy on greenhouse gas emissions;
 - b) an energy efficiency program;
 - c) a continuous improvement program;
 - d) better control systems; and
 - e) a CO₂ recovery plan.
- (A11) A Stormwater Management Plan must be prepared and implemented for the site prior to construction and operation. The Stormwater Management Plan must address at least the following:
- prevention of incident storm water and storm water run-off from contacting wastes or contaminants;
 - diversion of upstream run-off away from areas where it may be contaminated by bulk products being loaded or unloaded, wastes, contaminants or other materials; and
 - collection, treatment and disposal of all contaminated storm water run-off.

- (A12) A Waste Management Program (WMP) in accordance with Part 5 of the Environmental Protection (Waste Management) Policy 2000 must be developed, implemented within 3 (three) months from the date of this authority, and maintained for the authorised petroleum activities.
- (A13) The EM Plan must not be implemented or amended in a way that contravenes or is inconsistent with any condition of this approval.
- (A14) Contingency plans and emergency procedures must be developed and implemented for non-routine situations to deal with foreseeable risks and hazards including corrective responses to prevent and mitigate environmental harm (including a contingency plan when plant shuts down for maintenance or other reasons).

THIRD PARTY AUDITING

- (A15) Compliance with the conditions of this authority must be audited by an appropriately qualified third party auditor, nominated by the holder of this authority and accepted by the administering authority, within one year of the commencement of this authority, and annually thereafter.
- (A16) Upon receipt of the final third party audit report, the holder of this authority must submit a copy to the administering authority.
- (A17) The third party auditor must certify the findings of the audit in the report.
- (A18) The financial cost of the third party audit is borne by the holder of this authority.
- (A19) The holder of this authority must immediately act upon any recommendations arising from the audit report and:
 - a) investigate any non-compliance issues identified; and
 - b) as soon as practicable, implement measures or take necessary action to ensure compliance with this authority.
- (A20) Subject to condition (A15), and not more than three (3) months following the submission of the audit report, the holder of this authority must provide written advice to the administering authority addressing the:
 - a) actions taken by the holder to ensure compliance with this authority; and
 - b) actions taken to prevent a recurrence of any non-compliance issues identified.

FINANCIAL ASSURANCE

- (A21) The holder of this authority must provide a financial assurance in the amount and form required by the administering authority for the authorised petroleum activities.
- (A22) The financial assurance is to remain in force until the administering authority is satisfied that no claim is likely to be made on the assurance.

DEFINITIONS

- (A23) Words and phrases used in this authority are defined in Appendix 1 – Definitions. Where a definition for a term used in this authority is not defined within this authority, the definitions in the *Environmental Protection Act 1994*, its Regulation and Environmental Protection Policies must be used.

[Note: for the sake of brevity, the appendix of definitions has not been provided in this EIS assessment report but will be provided in the environmental authority.]

SCHEDULE B AIR EMISSIONS**NUISANCE**

- (B1) The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activities must not cause an environmental nuisance (as defined in the *Environmental Protection Act 1994*) at a sensitive place or commercial place.
- (B2) The release of dust and/or particulate matter resulting from the activities must not cause an environmental nuisance (as defined in the *Environmental Protection Act 1994*) at a sensitive place or commercial place.

RELEASE OF CONTAMINANTS TO THE ATMOSPHERE

- (B3) The release of contaminants to the atmosphere from a point source must only occur from those release points identified in *Schedule B, Table 1 - Contaminant Release Points* and must be directed vertically upwards without any impedance or hindrance.
- (B4) Contaminants must be released to the atmosphere from a release point at a height and a flow rate not less than the corresponding height and velocity stated for that release point in *Schedule B, Table 1 - Contaminant Release Points* and in conditions (B9) and (B10) for flare contaminants.
- (B5) Contaminants must not be released to the atmosphere from a release point at a mass emission rate/concentration, as measured at a monitoring point, in excess of that stated in *Schedule B, Table 2 - Contaminant Release Limits to Air*.
- (B6) Contaminants must be monitored not less frequently than specified in *Schedule B, Table 2 - Contaminant Release Limits to Air*.
- (B7) Monitoring of any releases to the atmosphere required by a condition of this authority must be carried out in accordance with the following requirements:
- a) monitoring provisions for the release points listed in *Schedule B, Table 2 - Contaminant Release Limits to Air* must comply with the Australian Standard AS 4323.1 - 1995 'Stationary source emissions, Method 1: Selection of sampling positions' (or more recent editions);
 - b) the following tests must be performed for each determination specified in *Schedule B, Table 1 - Contaminant Release Limits to Air*:
 - i. gas velocity and volume flow rate;
 - ii. temperature; and
 - iii. water vapour concentration (moisture content);
 - c) where practicable, samples must be taken when emissions are expected to be at maximum rates; and
 - d) during the sampling period the following additional information must be gathered:
 - i. production rate at the time of sampling;
 - ii. raw materials used;
 - iii. number of turbines operating; and
 - iv. reference to the actual test methods and accuracy of the methods.
- (B8) All release points referred to in *Schedule B, Table 1 - Contaminant Release Points* must be conspicuously marked with the corresponding release point number.
Note - Prior to operation, a site map showing the exact location of the discharge points from the gas turbines and flare is to be provided to the Department of Environment and Resource Management (DERM).

Schedule B, Table 1 – Contaminant Release Points

<i>Release Point Number</i>	<i>Source Description</i>	<i>Stack Height (m)</i>	<i>Release Velocity* (m/s)</i>
RP1	Gas turbine Stage 1 unit 1	25	34
RP2	Gas turbine Stage 1 unit 2	25	34
RP3	Gas turbine Stage 2 unit 1	25	34
RP4	Gas turbine Stage 2 unit 2	25	34

*This limit applies during normal operating conditions.

Schedule B, Table 2 – Contaminant Release Limits to Air

Monitoring Location	Contaminant	Emission Limits *	Frequency of Monitoring
RP1	Oxides of Nitrogen (NOX)	25 ppmv dry at 15% O ₂ and 2.9 g/s (per stack)	All stacks must be monitored during commissioning of the facility and annually thereafter **.
RP2			
RP3			
RP4			
RP1	Volatile Organic Compounds (VOC)	5.9 ppmv (Total VOCs as CH ₄) and 0.2 g/s (per stack)	
RP2			
RP3			
RP4			

* These limits are applicable during normal operating conditions.

** Within 3 months of commissioning the facility, the holder of this authority must conduct air emission monitoring to demonstrate compliance with air emission limits listed in Table 2 and provide documentation of the monitoring to DERM.

FLARE RELATED CONDITIONS

- (B9) Contaminants released to the atmosphere from the flare at a height not less than the 30 m above ground.
- (B10) Contaminants released to the atmosphere from the flare must have a velocity greater than 20 m/s.
- (B11) The flare* must be equipped with a flare tip design to provide good mixing with air, flame stability and achieve a minimum Volatile Organic Compound (VOC) removal efficiency of 98% under varied gas flow rate and meteorological conditions and meet the best practice design standards of NSW EPA: Protection of the Environmental Operations (Clean Air) Amendment (Industrial and Commercial Activities) Regulation 2005, US EPA Code of Federal Regulations: 40 CFR 60.18 and 40 CFR 63.11. (* The flare plume must satisfy the Civil Aviation Safety Authority (CASA) requirements prior to operation.)
- (B12) The flare must be equipped with a continuously burning pilot or other automatic ignition system that assures gas ignition and provides immediate notification to appropriate personnel when the ignition system ceases to function.
- (B13) The flare must be designed to handle large fluctuations in both the volume and the chemical content of gases.
- (B14) Visible smoke and particulate emissions must not be permitted for more than five minutes in any two hour period.

(B15) The sulphur content of fuel burned in the power generators must not exceed 0.5 percent by weight.

SCHEDULE C WATER MANAGEMENT

RELEASE TO WATERS

(C1) Only stormwater runoff from the site may be discharged off the site to Port Curtis subject to condition C2, C3 and C4.

(C2) Stormwater runoff from the site discharged to waters must be in compliance with the discharge limits and be monitored at the frequencies, listed in Schedule C Table 1 - Contaminant Release Limits to Water

Note - Prior to operation, a site map showing the exact location of discharge points to and from the detention basin(s) is to be provided to the DERM.

Schedule C - Table 1 Contaminant release limits to water

Water Quality Characteristics	Discharge Limit	Limit Type	Frequency
Dissolved Oxygen (mg/L)	4.0	Minimum	Daily, prior to discharge, else monthly*
Suspended Solids (mg/L)	40	Maximum	Daily, prior to discharge, else monthly*
pH	6.5 – 8.5	Range	Daily prior to discharge, else monthly*
Hydrocarbons (mg/L)	10	Maximum	Daily, prior to discharge, else monthly*
Temperature (°C)	Background +2°C	Maximum	Daily, prior to discharge, else monthly*
Turbidity (NTU)	20	Maximum	Daily, prior to discharge, else monthly*
Total Nitrogen (ug/L)	300	Maximum	Daily prior to discharge, else monthly*
Total Phosphorus (ug/L)	20	Maximum	Daily, prior to discharge, else monthly*
Electrical Conductivity (mS/cm)	57	Maximum	Daily, prior to discharge, else monthly*
Total Dissolved Ions	Background +10%	Maximum	Daily, prior to discharge, else monthly*
5-Day Biochemical Oxygen Demand	20 mg/L	Maximum	Daily, prior to discharge, else monthly*

Note: * Means monitoring release points daily during any controlled discharges. In the period when the site is not discharging, monthly monitoring must be undertaken of water in the final pond of sediment dam adjacent to the spillway.

- (C3) The release of contaminants to waters must not:
- produce any slick, discoloration of ambient waters or visible evidence of oil or grease, nor contain visible floating oil, grease, scum, litter or other objectionable matter; nor
 - have any other properties nor contain any other contaminants in concentrations that are likely to cause environmental harm.
- (C4) Prior to any release, any stormwater captured within the containment system must be free from contaminants or wastes that may cause environmental harm.
- (C5) The detention basin(s) must be maintained to ensure they can hold stormwater from a 1 in a 10 year flood event.

SPILLAGE CONTROL

- (C6) The spillage of bulk products being loaded or unloaded, wastes, contaminants or other materials must be cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, sweeping or otherwise releasing such wastes, contaminants or material to any external storm water drainage system, roadside gutter or waters.

MAINTENANCE OF STORMWATER MANAGEMENT DEVICES

- (C7) Suitable banks and/or diversion drains must be installed and maintained to exclude stormwater runoff from entering the LNG facility footprint.
- (C8) All stormwater management devices must be installed and maintained to ensure they are working properly at all times, including the following:
- oil and grit separator devices;
 - detention basin(s);
 - grass swales; and
 - trash racks and protected risers.

MONITORING OF WATERS

- (C9) The holder of this authority must develop an ambient water monitoring program in consultation with the administering authority and then implement the program. The ambient water monitoring program must address, as a minimum, water chemistry and biology for all of the waters impacted by authorised activities, and report on the data and analysed results of the monitoring program annually.

CONTAMINANT RELEASES TO GROUNDWATER

- (C10) There must be no release of contaminants to groundwater.

SCHEDULE D NOISE MANAGEMENT

- (D1) Noise from the LNG plant activities must not cause environmental nuisance at any sensitive place or commercial place.
- (D2) When requested by the administering authority, noise monitoring must be undertaken within a reasonable and practicable timeframe nominated by the administering authority to investigate any complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer) of environmental nuisance at any sensitive place or commercial place, and the results must be notified within 14 days to the administering authority following completion of monitoring.
- (D3) If the authority holder can provide evidence through monitoring that the limits defined in Schedule D – Table 1 are not being exceeded then the holder is not in breach of Condition (D1). Monitoring and subsequent analysis must provide:
- (a) determination of $L_{Aeq,15 mins}$ for the LNG plant noise at the noise sensitive place or commercial place;
 - (b) narrow band analysis and the noise 'signature' of the LNG plant to determine the contribution from the LNG plant to the total noise level at the noise sensitive place or commercial place;
 - (c) the level and frequency of occurrence of impulsive or tonal noise;
 - (d) taking measurements of the low frequency noise below 200 Hz;
 - (e) atmospheric conditions including temperature, wind speed and direction; and
 - (f) location, date and time of recording.
- (D4) If monitoring indicates exceedence of the limits in Schedule D – Table 1 due to the contribution from the LNG plant activities, then the holder of this authority must:

- (a) resolve the complaint with the use of appropriate dispute resolution techniques to the satisfaction of the administering authority; or
- (b) consider Best Practice Environmental Management in instigating noise abatement measures to comply with noise emission limits in Schedule D – Table 1.

Schedule D - Table 1 – Noise component limits for the LNG Plant

Noise component at the following locations (outdoors):				
	No 2 Fisherman’s Rd	Smith Road locality	Larcombe Street locality	Curtis Island
LAeq, 15 mins	37 dB(A)	24 dB(A)	24 dB(A)	28 dB(A)
LA1adj, 15 mins	42 dB(A)	29 dB(A)	29 dB(A)	33 dB(A)

Notes: A map showing the exact location of residential noise receptors in the vicinity of Fisherman’s Landing will be provided in the environmental authority.

The noise levels in Table 1 apply for the day, evening and night periods since the LNG plant operates continuously on a 24-hour basis.

- (D5) The method of measurement and reporting of noise levels must comply with the latest edition of the Environmental Protection Agency’s Noise Measurement Manual.

NOISE CONTROL MEASURES

- (D6) The authorised activities must be carried out by such reasonable and practicable means necessary to minimise the noise generated. The measures adopted must be incorporated into the relevant procedure(s) implemented under the Environmental Management Plan required by condition (A10) and must include, but not necessarily be limited to, the following noise abatement measures:
 - i) ensure that any equipment to be used on the site is assessed for potential noise nuisance impacts and appropriately attenuated;
 - ii) low frequency components at the plant including the gas turbine are to be attenuated according to Australian standards and Best Practice Environmental Management;
 - iii) ensure that engine cowlings and high efficiency silencers are fitted to all the engines of all plant and equipment identified as impacting on noise sensitive receivers; and
 - iv) where operation of reversing beepers is likely to cause environmental nuisance, taking measures to ensure mitigation of the environmental nuisance, for example by de-tuning the reversing beepers, replacing the reversing beepers with other warning devices and/or replacing reversing beepers with alternative reversing beepers which adjust their noise level output in accordance with the prevailing background noise level.

LOW FREQUENCY NOISE

- (D7) Notwithstanding condition (D1) and the limits specified in Table 1 in condition D4, emission of any noise below 200 Hz must not cause an environmental nuisance.
- (D8) Low frequency noise from the LNG plant is NOT considered to be a nuisance under condition (D7) if monitoring shows that noise emissions do not exceed the following limits:
 - a) 50 dB(Z) measured inside the noise sensitive place or commercial place; and
 - b) the difference between the internal A-weighted and Z-weighted noise levels is no greater than 15 dB.

SCHEDULE E WASTE MANAGEMENT

- (E1) Waste generated in the carrying out the activities must be stored, handled and transferred in a proper and efficient manner. Waste must not be released to the environment, stored, transferred or disposed contrary to any condition of this authority.



- (E2) The holder of this authority must ensure that activities authorised under this environmental authority do not result in the release or likely release of a hazardous contaminant to land or waters.
- (E3) The holder of this authority must ensure that all general waste produced from the conducting of the activities under this environmental authority is removed and disposed of at a facility that is permitted to accept such waste.
- (E4) All regulated waste removed from the site must be removed by a person who holds a current authority to transport such waste under the provisions of the *Environmental Protection Act 1994* and sent to a facility that is permitted to accept such waste.
- (E5) When regulated waste is removed from within the boundary of the authorised facility and transported by the holder of this authority, a record must be kept of the following:
 - a) date of waste transport;
 - b) quantity of waste removed and transported;
 - c) type of waste removed and transported;
 - d) quantity of waste delivered; and
 - e) any incidents (e.g. spillage) that may have occurred en route.
- (E6) Regulated waste is not permitted to be disposed on site, including septic waste and concentrate water from the reverse osmosis plant.

SCHEDULE F LAND MANAGEMENT

PREVENTING CONTAMINANT RELEASE TO LAND

- (F1) All chemicals, fuels and other liquid contaminants must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and in accordance with appropriate standards including: AS4326 Storage and Handling of Oxidising Substances, AS1940 - Storage and Handling of Flammable and Combustible Liquids and AS3780 – The Storage and Handling of Corrosive Substances.

CONTAMINATED LAND

- (F2) Prior to construction, investigations to be carried out in accordance with the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (EPA, 1998), the *Environmental Protection Act 1994*, and the National Environment Protection (Site Assessment) Measure 1999 (NEPM) for contaminated land.
- (F3) As soon as practicable and within 3 (three) months of cessation of authorised activities that cause any significant disturbance to land, the holder of this authority must investigate contaminated land status in accordance with *Environmental Protection Act 1994* requirements and the NEPM where land has been subject to contamination caused by activities authorised under this authority;

ACID SULFATE SOILS

- (F4) The holder of this authority must conduct an acid sulfate soils (ASS) investigation prior to construction and in accordance with the requirements of the State Planning Policy 2/02 Development involving Acid Sulfate Soils and relevant guidelines such as the Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998.
- (F5) Acid sulfate soils must be managed such that contaminants are not directly or indirectly released, as a result of the activity, to any waters or the bed and banks of any waters.

PEST AND WEED SPECIES

- (F6) Pest and weed species must be managed to prevent their growth and proliferation.

MANAGEMENT OF FAUNA

- (F7) The holder of this authority must develop and implement, within three (3) months from the date of this approval, a Fauna Management Plan that details how the holder will ensure that authorised activities are undertaken to minimise the potential risk of causing harm to fauna.
- (F8) The holder of this authority must minimise lighting disturbance to marine turtles by:
- physically shielding lights and directing the lights onto work areas;
 - keeping light heights as low as practicable;
 - using long wave length lights instead of short wavelength lights where practicable;
 - minimising reflective surfaces; and
 - fitting motion detectors and light timers where practicable.

SEDIMENT CONTROL

- (F9) Erosion protection measures and sediment control measures must be implemented and maintained to prevent erosion and release of sediment.

SCHEDULE G STORAGE AND HANDLING OF CHEMICALS, FLAMMABLE AND COMBUSTIBLE SUBSTANCES

- (G1) All explosives, hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids (including petroleum products and associated piping and infrastructure) must be stored and handled in accordance with the relevant Australian Standard where such is available.
- (G2) Notwithstanding the requirements of any Australian Standard and any other relevant Australian or State legislation, any liquids stored on site that have the potential to cause environmental harm must be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land. Where no relevant Australian Standard is available, the following must be applied:
- storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas; and
 - drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25% of the maximum design storage volume within the bund.
- (G3) All containment systems must be roofed and designed to minimise rainfall collection within the system.

SCHEDULE H PETROLEUM INFRASTRUCTURE

GENERAL CONDITIONS

- (H1) Infrastructure authorised under this authority must be located within the area defined by the relevant authority [NB: a map showing the exact location of petroleum infrastructure will be provided in the environmental authority]. Prior to operation, a detailed plan showing the exact layout of the LNG plant is to be provided to DERM.

- (H2) All infrastructure (including buildings, structures, petroleum equipment and plant erected and/or used for the authorised activities) authorised under this authority must be removed from the relevant environmental authority prior to surrender of this authority, except where agreed in writing by the administering authority and the current landowner.
- (H3) Prior to the commencement of decommissioning or abandonment activities, the scope of work for decommissioning or abandonment of project infrastructure shall be developed and agreed to with the administering authority.

SCHEDULE I MONITORING PROGRAMS

- (I1) The holder of this authority must:
 - a) develop and implement a monitoring program, within three (3) months from the date of this approval, that will demonstrate compliance with the conditions in this authority; and
 - b) document the monitoring and inspections carried out under the program and any actions taken.
- (I2) The holder of this authority must ensure that a suitably qualified, experienced and competent person(s) conducts all monitoring required by this authority.
- (I3) The holder of this authority must record, compile and keep for a minimum of five (5) years all monitoring results required by this authority and make available for inspection all or any of these records upon request by the administering authority. Monitoring results relating to rehabilitation should be kept until the relevant petroleum tenure is surrendered.
- (I4) Any management or monitoring plans, systems or programs required to be developed and implemented by a condition of this authority must be reviewed for performance and amended if required on an annual basis.
- (I5) An annual monitoring report must be prepared each year and presented to the administering authority when requested. This report shall include but not be limited to:
 - a) a summary of the previous twelve (12) months monitoring results obtained under any monitoring programs required under this authority and, a comparison of the previous twelve (12) months monitoring results to both this authority limits and to relevant prior results; and
 - b) an evaluation/explanation of the data from any monitoring programs; and
 - c) a summary of any record of quantities of releases required to be kept under this authority; and
 - d) a summary of the record of equipment failures or events recorded for any site under this approval; and
 - e) an outline of actions taken or proposed to minimise the environmental risk from any deficiency identified by the monitoring or recording programs.

SCHEDULE J COMMUNITY ISSUES

- (J1) When the administering authority advises the holder of a complaint alleging environmental nuisance, the holder must investigate the complaint and advise the administering authority in writing of the action proposed or undertaken in relation to the complaint.
- (J2) When requested by the administering authority, the holder of this authority must undertake monitoring specified by the administering authority, within a reasonable and practicable timeframe nominated by the administering authority, to investigate any complaint of environmental harm at any sensitive or commercial place.
- (J3) The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures implemented must be provided to the administering authority within fourteen (14) days of completion of the investigation, or receipt of monitoring results, whichever is the latter.

- (J4) If monitoring in accordance with Condition (J2), indicates that emissions exceed the limits set by this authority or are causing environmental nuisance, then the holder of this authority must:
- address the complaint including the use of appropriate dispute resolution if required; and/or
 - as soon as practicable implement abatement or attenuation measures so that noise, dust, particulate or odour emissions from the authorised activities do not result in further environmental nuisance.
- (J5) Maintain a record of complaints and incidents causing environmental harm, and actions taken in response to the complaint or incident; and
- (J6) The holder of this authority must record the following details for all complaints received and provide this information to the administering authority on request:
- name, address and contact number for complainant;
 - time and date of complaint;
 - reasons for the complaint;
 - investigations undertaken;
 - conclusions formed;
 - actions taken to resolve complaint;
 - any abatement measures implemented; and
 - person responsible for resolving the complaint.
- (J7) The holder of this authority must retain the record of complaints required by this condition for five (5) years.

SCHEDULE K NOTIFICATION PROCEDURES

- (K1) The holder of this authority must telephone the Department of Environment and Resource Management's Pollution Hotline (1300 130 372) or local office as soon as practicable after becoming aware of any release of contaminants not in accordance with the conditions of this authority or any event where environmental harm has been caused or may be threatened.
- (K2) Subject to Condition (K1), the holder of this authority is required to report in the case of uncontained spills (including hydrocarbon, contaminated water or mixtures of both) of the following volumes or kind:
- releases of any volume to water;
 - releases of water contaminated with hydrocarbons of volume greater than 200L to land; and
 - releases of any volumes where potential serious or material environmental harm is considered to exist.
- (K3) The notification of emergencies or incidents as required by Conditions number (K1 and K2) must include but not be limited to the following:
- the authority number and name of holder;
 - the name and telephone number of the designated contact person;
 - the location of the emergency or incident;
 - the date and time of the release;
 - the time the holder of the authority became aware of the emergency or incident;
 - the estimated quantity and type of any substances involved in the incident;
 - the actual or potential suspected cause of the release;
 - a description of the effects of the incident including the environmental harm caused, threatened, or suspected to be caused by the release;
 - any sampling conducted or proposed, relevant to the emergency or incident; and
 - actions taken to prevent any further release and mitigate any environmental harm caused by the release.

- (K4) Within fourteen (14) days following the initial notification of an emergency or incident or receipt of monitoring results, whichever is the later, further written advice must be provided to the administering authority, including the following:
- a) results and interpretation of any samples taken and analysed;
 - b) outcomes of actions taken at the time to prevent or minimise environmental harm; and
 - c) proposed actions to prevent a recurrence of the emergency or incident.
- (K5) As soon as practicable, but not more than six (6) weeks following the conduct of any environmental monitoring performed in relation to the emergency or incident, which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with the conditions of this authority, written advice must be provided of the results of any such monitoring performed to the administering authority.

5 Adequacy of the EM plan for the project

A draft EM plan was included with the draft EIS that was released for public notification. The draft EM plan was subsequently amended in the Supplementary Report. However, it does not yet address all the commitments included in the recommended conditions stated above. Consequently, for the purposes of the statutory requirements the submitted EM plan cannot be considered adequate. It will be necessary for the proponent to submit an EM plan that meets the requirements of s310D of the EP Act before the application for an environmental authority can be progressed.

6 Suitability of the project

DERM has considered the final TOR, the submitted EIS, all submissions on the submitted EIS, and the standard criteria. The submitted EIS and supplementary information have not identified impacts of sufficient magnitude to prevent the project from proceeding. Therefore, the project is considered suitable to proceed to the next stage of the approval process. However, the recommendations of this EIS assessment report should be fully implemented.

Disclaimer:

While this document has been prepared with care it contains general information and does not profess to offer legal, professional or commercial advice. The Queensland Government accepts no liability for any external decisions or actions taken on the basis of this document. Persons external to the Department of Environment and Resource Management should satisfy themselves independently and by consulting their own professional advisors before embarking on any proposed course of action.

Approved by



Signature



Date

Stuart Cameron
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