

**Draft terms of reference for an  
environmental impact statement:**

**Gladstone Energy and Ammonia  
project**

**November 2018**

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## Part A. About these terms of reference

### 1. Introduction

- 1.1. This document outlines the draft terms of reference for the proposed Gladstone Energy and Ammonia project proposed by Australian Future Energy Pty Ltd (AFE) being assessed under the *State Development and Public Works Organisation Act 1971* (SDPWO Act).
- 1.2. The project will be located within the Gladstone State Development Area and proposes to convert 1.5 million tonnes per annum of coal to produce liquid ammonia, synthetic natural gas and electricity.

### 2. Statutory basis

- 2.1. The Coordinator-General has declared the Gladstone Energy and Ammonia project to be a 'coordinated project for which an environmental impact statement (EIS) is required' under section 26(1)(a) of the SDPWO Act. This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the SDPWO Act, which requires a proponent to prepare an EIS for the project.
- 2.2. These terms of reference (TOR) set out the matters the proponent must address in an EIS for the project and are approved by the Coordinator-General under section 30 of the SDPWO Act.

### 3. EIS guidelines

- 3.1. This TOR should be read in conjunction with *Preparing an environmental impact statement: Guideline for proponents* (refer Appendix 1), which explains the following:
  - (a) participants in the EIS process
  - (b) consultation requirements
  - (c) EIS format and copy requirements.
- 3.2. In addition, subject-specific guidelines are referenced throughout this TOR; refer to Appendix 1 for a list of these policies and guidelines.

### 4. More information

For information about the project or the EIS process conducted under the SDPWO Act, visit <http://www.dsdmip.qld.gov.au/coordinator-general>

## Part B. Content of EIS

### 5. General approach

- 5.1. The objectives of the EIS are to provide a detailed description of the proposed project and to ensure that all relevant environmental, social and economic impacts of the project are identified and assessed, and to recommend mitigation measures to avoid or minimise adverse impacts. The EIS should demonstrate that the project is based on sound environmental principles and practices.
- 5.2. For the purposes of the EIS process, 'environment' is defined in Schedule 2 of the SDPWO Act and includes social and economic matters.

- 5.3. The detail at which the EIS deals with matters relevant to the project should be proportional to the scale of the impacts on environmental values. When determining the scale of an impact, consider its intensity, duration, cumulative effect, irreversibility, the risk of environmental harm, management strategies and offsets provisions.
- 5.4. The EIS is to be generally in accordance with relevant policies, standards and guidelines. Application of such guidelines, standards and policies will be confirmed throughout the development of the EIS in consultation between the Coordinator-General, the proponent and advisory agencies.

## 6. Mandatory requirements of an EIS

- 6.1. For all the relevant matters, the EIS must identify and describe the environmental values that must be protected. Environmental values are specified in the *Environmental Protection Act 1994* (EP Act),<sup>1</sup> the Environmental Protection Regulation 2008 (EP Regulation), environmental protection policies (EPPs) and relevant guidelines.<sup>2</sup>
- 6.2. The assessment should cover both the short and long term and state whether any relevant impacts are likely to be irreversible. The assessment should also discuss scenarios of unknown and unpredictable impacts.
- 6.3. Provide all available baseline information relevant to the environmental risks of the project. Provide details about the quality of the information provided, in particular: the source of the information; how recent the information is; how the reliability of the information was tested; and any uncertainties in the information.
- 6.4. Provide detailed strategies in regard to all critical matters for the protection, or enhancement as desirable, of all relevant environmental values in terms of outcomes and possible conditions that can be measured and audited. In general, the preferred hierarchy for managing likely impacts is: (a) to avoid; (b) to minimise/mitigate; and (c) if necessary and possible, to offset.
- 6.5. Impact minimisation measures should include ongoing monitoring and proposals for an adaptive management approach, as relevant, based on monitoring. The proposed measures should give confidence that, based on current technologies, the impacts can be effectively minimised over the long-term.
- 6.6. Each matter assessed in the EIS (as described in section 11 of this TOR) should include a concise summary of the potential impacts of the project and the measures proposed by the proponent to avoid, minimise, mitigate, manage and/or offset those impacts.
- 6.7. Present feasible alternatives of the project's configuration, including conceptual, technological and locality. Provide sufficient detail to provide understanding for preferred option/s and discuss the consequences of not proceeding with the project.
- 6.8. Assess the extent to which the construction and operation of the project meets all statutory and regulatory requirements of the State and that the intended outcomes are consistent with current state policies and guidelines. If there is conflict, provide comment on the planning merit that supports the project.

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<sup>1</sup> Part 3, Division 2, Subdivision 1, section 9

<sup>2</sup> For example, the *Queensland Water Quality Guidelines* and the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (refer to Appendix 1 for details).

## 7. Further requirements of an EIS

- 7.1. The proponent must identify in the EIS the scope of all government approvals sought through the EIS process. The assessment and supporting information should be sufficient for the administering authority to decide whether an approval should be granted. Where applicable, sufficient information should be included to enable approval conditions to be decided.
- 7.2. To the extent of the information available, the assessment should endeavour to predict the cumulative impact<sup>3</sup> of the project on environmental values over time and in combination with impacts created by the activities of other adjacent and upstream and downstream developments and landholders—as detected by baseline monitoring. This will inform the decision on the EIS and the setting of conditions. The absence of a comprehensive cumulative impacts analysis need not be fatal to the project. The EIS should also outline ways in which the cumulative impact assessment and management could subsequently be progressed further on a collective basis.
- 7.3. Include a consolidated description of all the proponent's commitments to implement management measures (including monitoring programs). Should the project proceed, these should be able to be carried over into the approval conditions as relevant.
- 7.4. Provide all geographical coordinates throughout the EIS in latitude and longitude against the Geocentric Datum of Australia 1994 (GDA94).
- 7.5. An EIS must also describe the expected benefits and opportunities associated with the project.
- 7.6. An appropriate public consultation program is essential to the impact assessment process. The proponent should consult with Local, State and Commonwealth government agencies, and potentially affected local communities.
- 7.7. The EIS must describe the consultation that has taken place and how the responses from the community and agencies have been incorporated into the design and outcomes of the project.
- 7.8. Include, as an appendix, a public consultation report detailing how the public consultation plan was implemented, and the results.

## 8. Executive summary

- 8.1. The executive summary must describe the project and convey the most important and preferred aspects and environmental management options relating to the project in a concise and readable form. It should use plain English, avoid jargon, be written as a stand-alone document and be structured to follow the EIS. It should be easy to reproduce and distribute on request to those who may not wish to read or purchase the whole EIS.

## 9. Introduction

- 9.1. Clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. Include an overview of the structure of the document.

### Project proponent

- 9.2. Describe the following:
  - (a) the proponent's full name, postal address and Australian Business Number, if relevant (including details of any joint venture partners)

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<sup>3</sup> Cumulative impact is defined as 'combined impacts from all relevant sources (developments and other activities in the area)'.

- (b) the nature and extent of business activities
- (c) proponent's experience
- (d) proponent's (including directors) environmental record in Australia, including a list of any breach of relevant environmental laws during the previous ten years
- (e) proponent's environmental, health, safety and community policies
- (f) experience and qualifications of consultants and sub-consultants engaged by the proponent to complete the EIS.

### The environmental impact assessment process

- 9.3. Provide an outline of the environmental impact assessment process, including the role of the EIS in the Coordinator-General's decision-making process. The information in this section is required to ensure readers are informed of the process to be followed and are aware of any opportunities for input and participation.
- 9.4. Inform the reader how and when properly made public submissions on the EIS will be addressed and taken into account in the decision-making process.

### Project approvals process

- 9.5. Describe the approvals required to enable the project to be constructed and operated. Explain how the environmental impact assessment process (and the EIS itself) informs the issue of the leases/licences/permits/consents required by the proponent before construction can commence.
- 9.6. The State Development Assessment Provisions (SDAP) prescribed in the *Planning Regulation 2017* set out the matters of interest to the state for development assessment where the chief executive of the *Planning Act 2016* is the assessment manager for development applications. If the proponent intends to satisfy the information requirements of future development assessment decisions under SDAP for any component of the project during this coordinated project EIS process, the material provided in accordance with sections 9-11 of this TOR should be sufficient to permit those assessments to be completed for that project component. Further information on SDAP requirements can be assessed from <https://planning.dsdmip.qld.gov.au/>.
- 9.7. The EIS must provide, where relevant, the information required under section 125 of the EP Act in support of the project's environmental authority application for Environmentally Relevant Activities (ERAs). Any ERA to be conducted as part of the project should be listed separately with appropriate ERA number, activity name and required threshold (see EP Regulation, Schedule 2 for a list of ERAs). The assessment and supporting information should be sufficient for the administering authority to decide whether an approval should be granted. Environmental values and approval requirements, are specified in the EP Act, the EP Regulation, environmental protection policies and relevant guidelines.

## 10. Project description

### Proposed development

- 10.1. The EIS must describe and illustrate at least the following specific information about the proposed project:
  - (a) project title
  - (b) project description
  - (c) project objectives
  - (d) expected capital expenditure

- (e) rationale for the project
- (f) regional and local context of the project's footprint (with maps at suitable scales)
- (g) relationship to other major projects and/or developments (of which the proponent should reasonably be aware)
- (h) workforce numbers to be employed by the project during its various phases
- (i) where personnel would be accommodated
- (j) proposed construction staging and likely schedule of works.

## Site description

- 10.2. Provide real property descriptions of the project land and adjacent properties; any easements; any tenures; and identification number of any lease for the project land that is subject to the application. Key transport, state-controlled roads, rail, air, port/sea and other infrastructure or services in the region and to the site should be described and mapped.
- 10.3. Describe and illustrate the topography of the project site and surrounding area, and highlight any significant features shown on the maps. Include and name rivers and creeks. Maps should include a scale and have contours at suitable increments relevant to the scale, location, potential impacts and type of project, shown with respect to Australian Height Datum (AHD) and drafted to GDA94.
- 10.4. Describe and illustrate specific information about the proposed project including the precise location of the proposed development in relation to designated and protected areas such as erosion prone areas, the coastal management district, marine park boundaries, fish habitat areas and World Heritage Areas.
- 10.5. Where relevant, describe and map in plan and cross-sections the geology and landforms, including catchments, of the project area. Show geological structures, such as aquifers, faults and economic resources (such as agricultural products) that could have an influence on, or be influenced by, the project's activities.
- 10.6. Where relevant, describe, map and illustrate soil types and profiles of the project area including added fill and/or exposed ground surface of all parts of the project area at a scale relevant to the proposed project. Identify soils that would require particular management due to wetness, erosivity, depth, acidity, salinity or other features.
- 10.7. Plans and drawings provided must be detailed enough to enable the Coordinator-General and advisory agencies to adequately assess the application.

## Climate

- 10.8. Describe the site's climate patterns that are relevant to the environmental assessment, with particular regard to discharges to water and air and the propagation of noise. Climate information should be presented in a statistical form including long-term averages and extreme values, as necessary.

## Proposed construction and operations

- 10.9. Describe the following information about the proposal:
  - (a) all pre-construction activities including the staging and sequencing (e.g. vegetation clearing, site access, interference with watercourses and floodplain areas, including wetlands)
  - (b) existing infrastructure and easements on the potentially affected land
  - (c) the proposed construction methods, associated equipment and techniques



- (d) location, design and capacity of water supply, telecommunications, power generation and transmission infrastructure
- (e) any infrastructure alternatives, justified in terms of ecologically sustainable development (including energy and water conservation)
- (f) hours of operation for proposed construction works, including night time works
- (g) the sequencing and staging of activities
- (h) the capacity of high-impact plant and equipment, their chemical and physical processes, and chemicals or hazardous materials to be used
- (i) the known locations of new or altered works and structures and infrastructure necessary to enable the construction and operation of the development
- (j) any activity that is a prescribed ERA or an activity under a petroleum facility licence that applies to construction and all operational phases of the development
- (k) location of quarry operations the project may source materials from
- (l) the range of land uses and site layout
- (m) built form and design specifics
- (n) operation detail (e.g. hours of operation for project components)
- (o) the commissioning process including landscaping and the rehabilitation of affected areas after construction
- (p) management structure of final development (e.g. body corporate)
- (q) infrastructure requirements (e.g. roads, electricity, telecommunications, sewerage)
- (r) location and scale of parking requirements.

## Infrastructure requirements

### Objectives

The project should provide necessary infrastructure to service the development that:

- (a) maintains or enhances services to existing users
- (b) ensures any required works are compatible with existing infrastructure.

- 10.10. This section should detail, with concept and layout plans, requirements for new infrastructure, or the upgrading and/or relocating of existing infrastructure to service the project. Infrastructure to be considered should include water supply, energy supply, telecommunications, stormwater, waste disposal and sewerage.
- 10.11. Describe the typical service corridors or clearances for sewerage and recycled water mains in relation to other services.

## 11. Assessment of project specific matters

### Air quality

#### Objective

Development is planned, designed, constructed and operated to protect the environmental values of air.

## Information requirements

- 11.1. Describe the characteristics of any contaminants or materials that may be released as a result of the construction or operations of the project, including point source and fugitive emissions (e.g. equipment and pipe leaks, storage tanks and wastewater treatment systems), treatment and discharge systems. Emissions (point source and fugitive) during construction, commissioning, operations, maintenance and a range of possible/likely upset conditions should be described.
- 11.2. Discuss the existing local and regional air shed environment, including:
  - (a) background levels and sources of particulates, gaseous and odorous compounds and any major constituent
  - (b) pollutants (including greenhouse gases)
  - (c) baseline monitoring results, sensitive receptors.
- 11.3. Predict the impacts of the releases from the relevant activity on environmental values of the receiving environment using recognised quality assured methods. The description of impacts should take into consideration the assimilative capacity of the receiving environment and the practices and procedures that would be used to avoid or minimise impacts. The impact prediction must:
  - (a) address residual impacts on the environmental values (including appropriate indicators and air quality objectives) of the air receiving environment, with reference to sensitive receptors<sup>4</sup>. This should include all relevant values potentially impacted by the activity, under the EP Act, EP Regulation and Environmental Protection (Air) Policy 2008 (EPP (Air))
  - (b) address the cumulative impact of the release with other known releases of contaminants, materials or wastes associated with existing development and possible future development (as described by approved plans and existing project approvals)
  - (c) predict the human health risk and amenity impacts associated with emissions from the project for all contaminants whether or not they are covered by the National Environmental Protection (Ambient Air Quality) Measure or the EPP (Air).
  - (d) Accurately describe the activities carried out on the site, including a process flow diagram clearly showing all unit operations to be carried out on the premises, and a detailed discussion of all unit operations
  - (e) Provide an air emission inventory of the site for all potential point, area and volume sources including fugitive emissions of dusts and a complete list of emissions to the atmosphere including SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>2</sub>, particulates (e.g. dust from roads, coal and ash), CO, VOC (total and speciated VOCs), hydrocarbons, trace metals, toxic/persistent/hazardous substances, PM<sub>10</sub> and PM<sub>2.5</sub> and any other likely contaminant. Results should be presented at standard temperature and pressure, and provide the mass emission rate, exit velocity, volume flow rate and temperature at exit; and specify the oxygen content of the gases from vent/flue or stack.
  - (f) Identify all expected emissions of hazardous air pollutants and their emissions from known and fugitive sources (e.g. equipment and pipe leaks, storage tanks and wastewater treatment systems), treatment and discharge systems
  - (g) estimate emission rates, based on actual measurements of samples taken from similar facilities—either full-scale facilities operating elsewhere, or experimental or demonstration-scale facilities. Where this is not possible, use published emission factors and/or data supplied by manufacturers of process and control equipment

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<sup>4</sup> For example, the locations of existing residences, places of work, schools, etc., agricultural or ecologically significant areas/species that could be impacted.

- (h) using relevant inputs of emissions and local meteorology as input to an air dispersion model, estimate the likely impacts on the surrounding environment. (The model inputs should be as detailed as possible, reflecting any variation of emissions with time and including at least a full year of representative hourly meteorological data)
  - (i) discuss the limitations and accuracy of the applied atmospheric dispersion models and the implications of this for the air quality modelling results
  - (j) identify commissioning, maintenance and range of upset scenarios including 'worst case' emissions that may occur during operation. If these emissions are significantly higher than those for normal operations, it will be necessary to separately evaluate the worst-case impact as a separate exercise to determine whether the planned buffer distance between the facility and neighbouring sensitive receptors will be adequate
  - (k) discuss dust and odour generation from construction activities, especially in areas where construction activities are adjacent to existing road networks or are in close proximity to sensitive receivers
- 11.4. Describe the proposed mitigation measures and how the relevant activity will be consistent with relevant best practice of similar industrial commercial operating plant pollution. Include details on:
- (a) all pollution control equipment and pollution control techniques employed on the premises and the features of the project designed to suppress or minimise emissions, including dusts
  - (b) any back-up measures that will act in the event of primary measures failing, to minimise the likelihood of upsets and adverse air impacts
- 11.5. Where a government plan is relevant to the activity or site where the activity is proposed, describe the activity's consistency with that plan.
- 11.6. Describe how the achievement of the air quality objectives would be monitored, audited and reported, and how corrective/preventative actions would be managed for all phases of the project.
- 11.7. Outline how dust mitigation measures and the coal dust management plan will be implemented.
- 11.8. Odour impact assessment should be undertaken in accordance with latest version of 'Guideline Odour Impact Assessment from Developments (DES) Greenhouse gas emissions'
- 11.9. Provide an inventory of projected annual emissions for the life of the project for each relevant greenhouse gas, with total emissions expressed in 'CO<sub>2</sub> equivalent' terms for the following categories as per the National Greenhouse and Energy Reporting scheme:
- (a) scope 1 emissions – means direct emissions of greenhouse gases from sources within the boundary of the facility and as a result of the facility's activities (including emission from vegetation clearing)
  - (b) scope 2 emissions – means emissions of greenhouse gases from the production of electricity, heat or steam that the facility will consume, but that are physically produced by another facility.
- 11.10. Discuss the potential for greenhouse gas abatement measures, including:
- (a) the proposed measures (alternatives and preferred) to avoid and/or minimise direct greenhouse gas emissions
  - (b) how the preferred measures minimise emissions and achieve energy efficiency
  - (c) any opportunities to further offset greenhouse gas emissions including carbon capture and trading.

## Hazards, health and safety

### Objectives

- (a) the risk of, and the adverse impacts from, natural hazards are avoided, minimised or mitigated to protect people and property and enhance the community's resilience to natural hazards.
- (b) development is to be appropriately located, designed and constructed to minimise health and safety risks to communities and individuals and adverse effects on the environment.

### Information requirements

#### General

- 11.11. Describe how any hazardous chemical facility risk created by the project is proportionate to the sensitivity of the surrounding land uses or zones, as per SDAP State Code 21. Describe how the project design and location provides for adequate protection from an off-site hazard scenario and any natural hazards.
- 11.12. Describe the potential risk to people and property that may be associated with the site in the form of a preliminary risk assessment for all components of the project including any storage and handling areas in accordance with relevant standards. The assessment should include:
  - (a) external and on-site risks including transport risks
  - (b) potential hazards, accidents, spillages, fire and abnormal events that may occur during all stages of the project, including estimated probabilities of occurrence
  - (c) identify all hazardous substances to be used, stored, processed or produced and the rate of usage
  - (d) potential wildlife hazards, natural events (e.g. cyclone, flooding, storm tide inundation, bushfire and landslide)
  - (e) how the project may potentially affect hazards away from the site (for example, changing flooding characteristics).
- 11.13. Outline measures required to ensure that the proposed project avoids the release of hazardous materials as a result of a natural hazard event.
- 11.14. Provide details on the safeguards that would reduce the likelihood and severity of hazards, consequences and risks to persons, within and adjacent to the project area(s). Identify the residual risk following application of mitigation measures. Present an assessment of the overall acceptability of the impacts of the project in light of the residual uncertainties and risk profile.
- 11.15. Provide an outline of the proposed integrated emergency management planning procedures (including evacuation plans, if required) for the range of situations identified in the risk assessment developed in this section including strategies to deal with natural disasters during operation and construction.
- 11.16. Outline any consultation undertaken with the relevant emergency management authorities, including the Local Disaster Management Group.
- 11.17. Describe the climatic conditions that may affect management of the project. This includes a description of the vulnerability of the project area to seasonal conditions, extremes of climate (e.g. cyclones and prolonged rain events (flooding) and natural or induced hazards (including bushfire).

### **Erosion prone areas**

- 11.18. Detail how coastal erosion risks are avoided or mitigated and identify any development free buffers.

### **Storm tide inundation**

- 11.19. Describe storm tide inundation risk for a range of annual exceedance probabilities for all parts of the project, and assess (through hydrodynamic modelling) how the project may affect storm tide hazard vulnerability of nearby premises. Take into consideration potential sea-level rise scenarios.
- 11.20. The assessment should consider all infrastructure associated with the project including levees, roads and linear infrastructure and all proposed measures to avoid or minimise risks to life, property, community (including damage to other properties) and the environment during storm tide events.

### **Flooding**

- 11.21. Describe flood risk for a range of annual exceedance probabilities (including Probable Maximum Flood) for all parts of the project, and assess how the project may change flooding characteristics. Take into consideration potential sea-level rise scenarios. Include a discussion of historical events.
- 11.22. The assessment should consider all infrastructure associated with the project including levees, roads and linear infrastructure and all proposed measures to avoid or minimise risks to life, property, community (including damage to other properties) and the environment during flood events.

### **Chemical Leaks and Spills**

- 11.23. An outline of the proposed integrated management planning procedures and safeguards to reduce the potential for chemical leaks and spills incorporated into design. The detection of spills and leaks and rectification to be implemented to control and rectify leaks and spills. Safeguards incorporated, buffer zones and all means incorporated to ensure human health and the environment are not impacted.

## **Land use**

### **Objectives**

Development should be designed and operated to:

- (a) improve environmental outcomes
- (b) contribute to community wellbeing
- (c) contribute to social, economic and environmental sustainability.

### **Information requirements**

- 11.24. Provide a copy of the proposed plan of development.
- 11.25. Discuss the compatibility of the project with the surrounding area and the Gladstone region, taking into consideration the proposed measures that would be used to avoid or minimise impacts. The discussion should include:
- (a) existing and proposed land uses, in and around the project area, referring to the regional plan, Gladstone State Development Area Development Scheme and the local government planning scheme
  - (b) any tenures overlying and adjacent to the project site, and any to be applied for as part of this project

- (c) consideration of state interests identified in the State Planning Policy (SPP)
  - (d) consideration of the master plan and master planned area for the Priority Port of Gladstone 2018, with particular regard to supply chain efficiency, port optimisation and associated objectives and desired outcomes.
  - (e) locational factors influencing the choice of site.
- 11.26. Discuss the proposal in the context of the Gladstone State Development Area Development Scheme 2015 and the Our Place Our Plan Gladstone Regional Council Planning Scheme 2017 for Gladstone Regional Council. A draft planning report can be provided as an appendix to the EIS should a draft material change of use application be considered as part of the Coordinator-General's evaluation.
- 11.27. Describe and illustrate the visual impact of the construction and operation of the project. Include major views, view sheds, outlooks, and features contributing to the amenity of the area, including assessment from private residences.
- 11.28. Present feasible alternatives of the project's configuration (including individual elements) that may improve environmental outcomes.
- 11.29. Identify potential and actual areas of acid sulfate soils. Where potential areas are identified, further investigations (including field surveys) should be undertaken in accordance with the SPP and accepted industry guidelines.
- 11.30. Detail any known or potential sources of contaminated land. Describe how any proposed land use may result in land becoming contaminated.
- 11.31. Identify existing and potential native title rights and interests possibly impacted by the project and the potential for managing those impacts by an Indigenous Land Use Agreement or other measure.

## Flora and fauna

### Objective

Matters of environmental significance are identified and appropriately safeguarded to support healthy and resilient ecosystems and ensure the sustainable, long-term conservation of biodiversity and the social, economic, cultural and environmental benefits it provides.

### Information requirements

- 11.32. Discuss the projects ability to support the strategic direction, objectives and desired outcomes of the master plan for the Priority Port of Gladstone 2018. Particular discussion should be given to how the project avoids, mitigates and/or offsets impacts to environmental values that contribute to the local expression of the outstanding universal value of the Great Barrier Reef World Heritage Area (GBRWHA) and scenic amenity.
- 11.33. Discussion of flora and fauna must include reference to the environmental management framework as it relates to the Port, Industry and commerce precinct and associated appendices of the master plan for the Priority Port of Gladstone 2018. Should any map at Appendix B of the master plan indicate a potential for an environmental value to exist within the project areas, further assessment must occur through the EIS to confirm the presence or absence of the environmental value.
- 11.34. Describe the likely impacts on the biodiversity and natural environmental values of affected areas arising from the construction and operation of the project. Take into account any proposed avoidance and/or mitigation measures. The assessment should include, but not be limited to, the following key elements:
- (a) matters of state environmental significance

- (b) terrestrial and aquatic ecosystems (including groundwater-dependent ecosystems) and their interaction
  - (c) biological diversity including listed flora and fauna species and regional ecosystems
  - (d) the existing integrity of ecological processes, including habitats of threatened, near-threatened or special least-concern species that may be impacted by the project
  - (e) the integrity of landscapes and places, including wilderness and similar natural places
  - (f) actions of the project that require an authority under the *Nature Conservation Act 1992* and *Water Act 2000* (for example, riverine protection permits) and/or would be assessable development for the purposes of the *Vegetation Management Act 1999* (VMA), the *Fisheries Act 1994* or the *Coastal Protection and Management Act 1995*
  - (g) chronic, low-level exposure to contaminants or the bio-accumulation of contaminants
  - (h) impacts on native fauna due to proximity to the site and site impacts (e.g. lighting, noise, waste).
- 11.35. Propose practical measures for protecting or enhancing natural values and assess how the nominated quantitative indicators and standards may be achieved for nature conservation management. In particular, address measures to protect or preserve any threatened or near-threatened species.
- 11.36. Describe strategies for protecting the Great Barrier Reef World Heritage Area and Ramsar wetlands relevant to the project, and discuss any obligations imposed by state or Commonwealth legislation or policy, or international treaty obligations (that is, Japan–Australia Migratory Birds Agreement (JAMBA), China–Australia Migratory Birds Agreement (CAMBA) and Republic of Korea–Australia Migratory Birds Agreement (ROKAMBA)).
- 11.37. Assess the need for buffer zones and the retention, rehabilitation or planting of movement corridors, and propose measures that would avoid the need for waterway barriers, or propose measures to mitigate the impacts of their construction and operation.
- 11.38. Describe how the achievement of the objectives would be monitored and audited, and how corrective actions would be managed.
- 11.39. Where a significant residual impact will occur on a prescribed environmental matter as outlined in the Environmental Offsets Regulation 2014, the offset proposal (s) must be consistent with the requirements of Queensland’s *Environmental Offsets Act 2014* and the latest version of the Queensland Environmental Offsets Policy (see Appendix 1).

## Water quality

### Objective

Development is planned, designed, constructed and operated to protect environmental values of Queensland waters and supports the achievement of water quality objectives.

### Information requirements

- 11.40. Describe the hydrology within the study area and the adjoining tidal waterways in terms of water levels, discharges and freshwater flows. Detail the interaction of freshwater flows with different tidal states.
- 11.41. Detail the chemical and physical characteristics of surface waters and groundwater within the area that may be affected by the project. Include a description of water quality variability associated with climatic and seasonal factors, variability of freshwater flows and extreme events.



- 11.42. Identify the quantity, quality and location of all potential discharges of water and wastewater by the project, whether as point sources (such as controlled discharges) or diffuse sources (such as irrigation to land of treated sewage effluent).
- 11.43. Describe the proposed management of existing and/or constructed waterbodies on the project site to maintain water quality, including any proposed exchange of tidal water. Assess the potential impacts of any discharges on the quality and quantity of receiving waters taking into consideration the assimilative capacity of the receiving environment and the practices and procedures that would be used to avoid or minimise impacts.
- 11.44. Describe how the achievement of the objectives would be monitored and audited, and how corrective actions would be managed. Describe mitigation strategies and contingency plans for:
  - (a) potential accidental discharges of contaminants and sediments during construction and operation
  - (b) stormwater run-off from the project facilities and associated infrastructure
  - (c) flooding of relevant river systems, the effects of tropical cyclones and other extreme events
  - (d) management of acid sulfate soils (see also paragraph 11.28)
  - (e) impacts to other properties and the environment during flood events.

## Water resources

### Objectives

The construction and operation of the project should aim to meet the following objectives:

- (a) equitable, sustainable and efficient use of water resources
- (d) environmental flows, water quality, in-stream habitat diversity, and naturally occurring inputs from riparian zones support the long-term maintenance of the ecology of aquatic biotic communities
- (e) the condition and natural functions of water bodies, lakes, springs and watercourses are maintained—including the stability of beds and banks of watercourses
- (f) waterway barrier works in fish habitats are constructed to maintain connectivity and habitat values
- (g) volumes and quality of groundwater are maintained and current lawful users of water (such as entitlement holders and stock and domestic users) and other beneficial uses of water (such as spring flows and groundwater-dependent ecosystems) are not adversely impacted by the development.

### Information requirements

- 11.45. Provide details of any proposed impoundment, extraction, discharge, injection, use or loss of surface water or groundwater. Identify any approval or allocation that would be needed under the *Water Act 2000*.
- 11.46. Provide detail that demonstrates the proposal meets the performance outcomes for SDAP Code 18: constructing or raising waterway barrier works in fish habitats (see Appendix 1) in relation to any causeways or bridge crossings that interfere with fish movement through the watercourse.
- 11.47. Detail any significant diversion or interception of overland flow. Include maps of suitable scale showing the location of diversions and other water-related infrastructure.



- 11.48. Develop hydrological models as necessary to describe the inputs, movements, exchanges and outputs of all significant quantities and resources of surface water and groundwater that may be affected by the project. The models should address the range of climatic conditions that may be experienced at the site, and adequately assess the potential impacts of the project on water resources. The models should include a site water balance. This should enable a description of the project's impacts at the local scale and in a regional context including proposed:
- (a) changes in flow regimes from structures and water take
  - (b) alterations to riparian vegetation and bank and channel morphology
  - (c) direct and indirect impacts arising from the development.
- 11.49. Provide information on the proposed water usage by the project, including details about:
- (a) the ultimate supply required to meet the demand for full occupancy of the development, including timing of demands
  - (b) the quality and quantity of all water supplied to the site during the construction and operational phases based on minimum yield scenarios for water reuse, rainwater reuse and any bore water volumes
  - (c) a water balance analysis
  - (d) a site plan outlining actions to be taken in the event of failure of the main water supply.
- 11.50. Describe proposed sources of water supply given the implication of any approvals required under the *Water Act 2000*. Estimated rates of supply from each source (average and maximum rates) must be given and proposed water conservation and management measures must be described.
- 11.51. Determination of potable water demand must be made for the project, including the temporary demands during the construction period. Include details of any existing town water supply to meet such requirements. Detail should also be provided to describe any proposed on-site water storage and treatment for use by the site workforce during construction and operational phases.
- 11.52. Provide detailed designs for all infrastructure utilised in the treatment of on-site water including how any onsite water supplies are to be treated, contaminated water is to be disposed of and any decommissioning requirements and timing of temporary water supply/treatment infrastructure is to occur.
- 11.53. Describe how the development will impact or alter the Gladstone Area Water Board Regional Water Supply Strategy.

## Social and economic

### Objectives

The construction and operation of the project should aim to:

- (a) avoid or mitigate adverse social and economic impacts arising from the project
- (b) capitalise on opportunities potentially available for capable local industries and communities where this does not have a significant negative impact on the project or reduce net economic benefits to the State.

### Information requirements

- 11.54. In accordance with the Coordinator-General's *Social impact assessment guideline* (refer Appendix 1), describe the likely social impacts (positive and negative) on affected communities, taking into account proposed mitigation measures.

- 11.55. Identify the relevant stakeholders (local and regional) and the likely economic impacts arising from each key stage of the construction and operation of the project. Proponents should quantify economic impacts where suitable data and methodology can be applied. Otherwise, these should be assessed qualitatively.
- 11.56. The economic analysis could consider but is not limited to potential impacts the project may have on:
- (a) Labour demand, including the ability for labour to be drawn from the existing local workforce, and the potential effects this may have on local businesses.
  - (b) The potential impacts the project may have on relevant prices, which might include wages, input costs and/or household goods and services.
  - (c) Analysis should be consistent with the Coordinator-General's *Economic impact assessment guideline* (April 2017) (refer Appendix 1).

## Cultural heritage

### Objective

The construction and operation of the project should aim to ensure that the nature and scale of the project does not compromise the cultural heritage significance of a heritage place or heritage area.

### Information requirements

- 11.57. Unless section 86 of the *Aboriginal Cultural Heritage Act 2003* (ACH Act) applies, the proponent must develop a Cultural Heritage Management Plan in accordance with the requirements of Part 7 of the ACH Act.
- 11.58. For non-Indigenous historical heritage, undertake a study of, and describe, the known and potential historical cultural and landscape heritage values of the area potentially affected by the project. Any such study should be conducted by an appropriately qualified cultural heritage practitioner. Provide strategies to mitigate and manage any negative impacts on non-Indigenous cultural heritage values and enhance any positive impacts.

## Noise and vibration

### Objective

Development is planned, designed, constructed and operated to protect the environmental values of the acoustic environment.

### Information requirements

- 11.59. Describe the characteristics of the noise and vibration sources that would be emitted when carrying out the activity (point source and general emissions). Describe noise and vibration emissions (including fugitive sources) that may occur during construction, commissioning, upset conditions, and operation.
- 11.60. Predict the impacts of the noise emissions from the construction and operation of the project on the environmental values of the receiving environment, with reference to sensitive receptors, using recognised quality assured methods. Discuss separately the key project components likely to present an impact on noise and vibration for the construction and operation phases of the project.
- 11.61. Taking into account the practices and procedures that would be used to avoid or minimise impacts, the impact prediction must address the:

- (a) activity's consistency with the objectives
  - (b) cumulative impact of the noise with other known emissions of noise associated with existing development and possible future development (as described by approved plans)
  - (c) potential impacts of any low-frequency (<200 Hz) noise emissions.
- 11.62. Describe how the proposed activity, and in particular, the key project components described above, would be managed to be consistent with best practice environmental management for the activity. Where a government plan is relevant to the activity, or the site where the activity is proposed, describe the activity's consistency with that plan.
- 11.63. Describe how the achievement of the objectives would be monitored and audited, and how corrective actions would be managed.

## Biosecurity

### Objectives

The construction and operation of the project should aim to ensure:

- (a) the spread of weeds and pest animals is minimised
- (b) existing weeds and pests are controlled.

### Information requirements

- 11.64. Propose detailed measures to control and limit the spread of pests and weeds on the project site and adjacent areas. This includes declared plants under the *Biosecurity Act 2014* and Biosecurity Regulation 2016 and any local government area Biosecurity Plants and weeds of national significance, and designated pests under the *Public Health Act 2005*. All proposed measures must be in accordance with any relevant biosecurity surveillance or prevention program authorised under the *Biosecurity Act 2014*.

## Waste management

### Objective

Any waste transported, generated, or received as part of carrying out the activity is managed in a way that protects all environmental values.

### Information requirements

- 11.65. For wastes besides wastewater (which is addressed in paragraph 11.41), describe all the expected significant waste streams from the proposed project activities during the construction and operational phases of the project.
- 11.66. Define and describe the objectives and practical measures for protecting or enhancing environmental values from impacts by wastes. Take into account best practice waste management strategies and the *Waste Reduction and Recycling Act 2011* and the Environmental Protection Regulation 2008 including regulated and trackable waste.
- 11.67. Assess the proposed management measures against the preferred waste management hierarchy, namely: avoid waste generation; cleaner production; recycle; reuse; reprocess and reclaim; waste to energy; treatment; disposal. This includes the generation and storage of waste.

- 11.68. Describe how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives would be monitored, audited and managed.
- 11.69. Provide details on natural resource use efficiency (such as energy and water), integrated processing design, and any co-generation of power and by-product reuse as shown in a material/energy flow analysis.

## Transport

### Objectives

The construction and operation of the project should aim to:

- (a) maintain the safety and efficiency of all affected transport modes for the project workforce and other transport system users
- (b) avoid or mitigate impacts on the condition of transport infrastructure
- (c) ensure any required works are compatible with existing infrastructure and future transport corridors.

### Information requirements

- 11.70. The EIS should include a clear summary of the total transport task for the project, including workforce, inputs and outputs during the construction and operational phases.
- 11.71. Present the transport assessment in separate sections for each project-affected mode (road, rail, air and sea) as appropriate for each phase of the project.
- 11.72. Provide sufficient information to allow an independent assessment of how existing transport infrastructure will be affected by project transport at the local and regional level (for example, local roads and state-controlled roads).
- 11.73. Include details of the adopted assessment methodology for impacts on roads within the road impact assessment report in accordance with the *Guide to Traffic Impact Assessment* (Appendix 1).
- 11.74. Discuss and recommend how identified impacts will be mitigated. Mitigation strategies and are to be prepared in close consultation with relevant transport authorities (including Local Government).

## 12. Appendices to the EIS

- 12.1. Appendices should provide the complete technical evidence used to develop assertions and findings in the main text of the EIS.
- 12.2. No significant issue or matter should be mentioned for the first time in an appendix—it must be addressed in the main text of the EIS.
- 12.3. Include a table listing the section of the EIS where each requirement of the TOR is addressed.
- 12.4. Include a glossary of terms and a list of acronyms and abbreviations.

## Acronyms and abbreviations

The following acronyms and abbreviations have been used in this document.

<b>Acronym/abbreviation</b>	<b>Definition</b>
AHD	Australian Height Datum
EIS	environmental impact statement
EP Act	<i>Environmental Protection Act 1994</i>
EP Regulation	Environmental Protection Regulation 2008
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
EPBC Regulations	Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)
EPP	Environmental Protection Policy (under the EP Act)
GDA94	Geocentric Datum of Australia 1994
MNES	matters of national environmental significance (under the EPBC Act)
SDAP	State Development Assessment Provisions prescribed in the Planning Regulation 2017
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
TOR	terms of reference
VMA	<i>Vegetation Management Act 1999</i>

## Appendix 1. Policies and guidelines

Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, *The Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian Water Association (Artarmon) and NZ Water and Wastes Association (Auckland), 2000, viewed 16 November 2018, <http://waterquality.gov.au/guidelines/anz-fresh-marine>

Commonwealth of Australia, *National Strategy for Ecologically Sustainable Development*, Ecologically Sustainable Development Steering Committee, Canberra, 1992, viewed 16 November 2018, <http://www.environment.gov.au/about-us/esd/publications/national-esd-strategy>

Commonwealth of Australia, *National Water Quality Management Strategy: Australian Drinking Water Guidelines*, National Health and Medical Research Council, 2011, updated November 2016, viewed 16 November 2018 <http://www.nhmrc.gov.au/guidelines-publications/eh52>

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Queensland Government, *Preparing an environmental impact statement: Guideline for proponents*, The Coordinator-General, Department of State Development, Infrastructure and Planning, Brisbane, 2015, viewed 16 December 2016, [www.statedevelopment.qld.gov.au/fact-sheets-and-guidelines/coordinated-projects.html](http://www.statedevelopment.qld.gov.au/fact-sheets-and-guidelines/coordinated-projects.html)

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