3. SUBMISSION AND ISSUES REGISTER

A register of issues raised in 30 submissions received on the Arrow LNG Plant Environmental Impact Statement (EIS) is provided in this chapter. The register lists the 365 consolidated issues, the submission in which they were raised, and Arrow Energy's response. There were 7 issues identified which relate to errata, these are outlined in Chapter 2, Summary of submissions and Issues. Arrow Energy's response to each of the issues is set out in the register as:

- A cross-reference to the relevant section in the EIS.
- A cross-reference to the relevant section in the EIS along with a brief explanation of the issue.
- A cross-reference to a more detailed explanation and/or further information which is presented in Part B, Chapter 4 of the supplementary report to the EIS (SREIS).
- A cross-reference to the relevant section in Part A of the SREIS that presents the findings of technical studies commissioned to address project description changes, clarification of information provided in the EIS, and information to inform responses to issues raised in submissions.

The register is organised according to the table of contents of the EIS. The headings in the register and in Part B, Chapter 4 reflect only those chapters of the EIS which were commented on in the submissions received.

Table 3.1 Issues register – Chapter 1: Introduction

Issue No.	Issue	Submission No.	Response Reference	Comments
69	Preliminary submission. See LNG S030.	LNG S015	–	Noted.
330	Section 1.2.1 of EIS states that two other LNG facilities are under construction – this should read 'three'.	LNG S026	**EIS** Chapter 9, Section 9.6.	At the time of finalising the EIS, only two LNG facilities were under construction on Curtis Island. The EIS does however take into account the potential impacts of all three LNG plants as well as its own project in the assessment and management of cumulative impacts. Various parts of the SREIS acknowledge that three LNG plants are under construction where this is relevant.
334	Figure 1.1 is unclear and must clearly identify GBRWHA land and marine areas.	LNG S026	**EIS** Chapter 1. Chapter 17.	Figure 1.1 within EIS Chapter 1, Introduction shows the landward boundary of the Great Barrier Reef World Heritage Area (GBRWHA). In addition, Figure 17.2 within EIS Chapter 17, Terrestrial Ecology provides a detailed map of the area around Port Curtis and Curtis Island, with the extent of the GBRWHA clearly shown.
337	Section 1.3.1 states that negative social and economic impacts may occur. Wording should be changed to 'will occur', as identified impacts are already occurring as a result of other LNG facilities.	LNG S026 LNG S031	**EIS** Chapter 1, Section 1.3.1. Chapter 26. Chapter 27.	As construction and operation of the Arrow LNG Plant has not yet commenced, Section 1.3.1 of the EIS outlines the potential for cumulative social and economic impacts from multiple new projects in the region should this occur. Further information on social and economic impacts as a result of the project is provided in EIS Chapter 26, Social and Chapter 27, Economics.

Table 3.2 Issues register – Chapter 2: Project approvals

Issue No.	Issue	Submission No.	Response Reference	Comments
5, 9	The EIS is inadequate in addressing the bilateral agreement requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).	LNG S001 LNG S002	**EIS** Chapter 2, Section 2.2.2. Attachment 3. SREIS Attachment 2.	A detailed response is provided in Section 4.1 of Chapter 4, Part B of the SREIS.
7	The provisions of the *Sustainable Planning Act 2009* (Qld) should apply rather than the outdated provisions of the *State Development and Public Works Organisation Act 1971* (Qld).	LNG S002	**EIS** Chapter 2. **SREIS** Attachment 1.	On 12 June 2009, the Coordinator-General declared the project a 'significant project' for which an environmental impact assessment is required under section 26(1)(a) of the State Development and Public Works Organisation Act. Consequently, it is this act that applies to the Arrow LNG Plant. Arrow Energy has also considered its obligations under the Sustainable Planning Act 2009, particularly with any additional development permits required for the project. Relevant approvals for the project are discussed in EIS Chapter 2, Project Approvals. Updated legislation relevant to the project is discussed in SREIS Attachment 1, Legislation Update.
120	Section 2 of the EIS does not describe approvals required under the *Forestry Act 1959* (Qld) for taking, destroying or interfering with forest products including timber and quarry materials. The proponent should liaise with the Manager Quarry Production, North, Department of Agriculture, Fisheries and Forestry regarding approvals required.	LNG S018	**SREIS** Attachment 1, Section A1.3.	At this stage of the project design, approval will not be required under the Forestry Act to take, destroy or interfere with forest products, including timber materials and quarry materials, on state land above the high water mark (apart from land within a lake or watercourse).

Table 3.2 Issues register – Chapter 2: Project approvals (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
121	Amend Section 2.3 regarding approvals required for taking seawater under the *Water Act 2000* (Qld) to read, "The take or interference with surface water, groundwater and overland flow may need to be authorised under the Water Act 2000."	LNG S018	**SREIS** Attachment 1, Section A1.3.	This issue has been addressed in the legislation and approvals update contained in SREIS Attachment 1, Legislation Update.
122	Inadequate information provided in relation to ERAs to assess potential impacts or form a basis for development of conditions of approval. ERAs outside the petroleum license areas will require development approval under the *Sustainable Planning Act 2009* (Qld). Full details of these ERAs (threshold, design, number and location of air and water discharge points inside and outside petroleum license areas) are required in the EIS to allow EHP to recommend appropriate conditions for the Coordinator-General's report.	LNG S018	**EIS** Chapter 15, Section 15.4. Chapter 21, Section 21.4. **SREIS** Chapter 8.2, Section 8.2. Chapter 14, Section 14.2	Full details of Environmentally Relevant Activities (ERAs) will be contained in the relevant approval applications for all project facilities that will be developed following completion of the EIS process. The EIS contains details of discharge points for air emissions (EIS Chapter 21, Air Quality, and SREIS Chapter 8, Air Quality) and water (EIS Chapter 15, Coastal Processes, and SREIS Chapter 14, Coastal Processes) which have been updated in the SREIS following the front-end engineering design (FEED) process. Final details will be provided with the relevant secondary approval applications following completion of the EIS process.
123	Consider whether the following ERAs will be required: • ERA 21 Motor vehicle workshop. • ERA 38 Surface coating. • ERA 47 Timber milling and wood chipping. • ERA 62 Waste transfer station operation.	LNG S018	**SREIS** Attachment 1.	Table A1.1 in SREIS Attachment 1, Legislation Update, provides an updated list of ERAs that may be required for the project. This list will be periodically reviewed, as detailed design and project execution progress. Based on current information, the following is noted in relation to the nominated ERAs: • Project activities are likely to encompass the activities covered by ERA 38 Surface coating. • It is anticipated that project activities will not encompass the activities covered by ERA 47. • A waste transfer station is not proposed as part of the LNG facility and hence ERA 62 is not relevant. • Workshops maintained as part of a petroleum activity are exempt from ERA 21.

Table 3.2 Issues register – Chapter 2: Project approvals (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
250	To the Transport Infrastructure Act description, add the provision (s62) about approving locations of access to state-controlled roads.	LNG S021	**SREIS** Attachment 1.	Noted.
263	Some legislation pertaining to shipping/transport is omitted in Attachment 1 of the EIS, namely the *Transport Operations (Marine Pollution) Act 1995* (Qld), the Transport Operations (Marine Pollution) Regulation 2008, the Queensland Coastal Contingency Action Plan, the Standards for Hydrographic Surveys within Queensland Waters and the Standard for Marine Construction Activities within Gladstone Harbour.	LNG S021	**SREIS** Attachment 1.	The SREIS provides an update of legislation and approvals relevant to the project (Attachment 1, Legislation Update). In particular, details have been provided of the Transport Operations (Marine Pollution) Act and the Transport Operations (Marine Pollution) Regulation in relation to ship-sourced pollution management strategies for Curtis Island and mainland facilities (Table A1.2). Hydrographic surveys were conducted in accordance with the requirements of the Standards for Hydrographic Surveys within Queensland Waters.
268	Arrow Energy has not considered that the accommodation camps are likely to require the provision of food for workers. Camp kitchens are required to comply with food safety legislation. Food provision to the workforce must be in compliance with the *Food Act 2006* (Qld).	LNG S021	**SREIS** Attachment 1.	This issue has been addressed in the legislation update contained in SREIS Attachment 1 (Table A1.2).
269	Arrow Energy has not considered that the accommodation camps are likely to require medical facilities. Obtaining, possessing and using scheduled drugs and poisons may require approval and compliance with legislative requirements. Medical provisions and their storage and administration must be in compliance with the necessary regulations.	LNG S022	**SREIS** Attachment 1.	Noted.

Table 3.2 Issues register – Chapter 2: Project approvals (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
309	Reference the *Mineral Resources Act 1989* (Qld). This is pertinent in light of overlapping minerals tenures. Reference the *Petroleum and Gas (Production and Safety) Act 2004* (Qld), particularly sections 807 and 808 in terms of pipeline land access activities.	LNG S025	**SREIS** Attachment 1, Section A1.1.1	This issue has been addressed in the legislation update contained in SREIS Attachment 1, Section A1.1.1.
311, 312, 314	Marine plant disturbances and waterway barrier works including filling and diverting the stream on Curtis Island require approval under *Sustainable Planning Act 2009* (Qld). Stream crossings must be covered either by the self-assessable codes for WWBW or be approved by the Department of Agriculture, Fisheries and Forestry (DAFF).	LNG S025	**SREIS** Attachment 1.	Noted. This issue has been addressed in the legislation update contained in SREIS Attachment 1. The drainage channels on Curtis Island that will be diverted are not considered to be watercourses by the Department of Environment and Heritage Protection (formerly the Department of Environment and Resource Management (DERM), February 11) as they do not exhibit the essential characteristics of a watercourse. The Department of Agriculture, Fisheries and Forestry (DAFF) has also agreed that these systems are not waterways, freshwater ecosystems, or fish habitat. The status of the drainage systems (not waterways, freshwater ecosystems, or fish habitat) on Curtis Island has been agreed via recent correspondence with DAFF.
321	Marine plants removed must not be burnt or left below the highest astronomical tide line. Marine plants authorised for removal are to be removed to the intertidal zone, unless the material is to be used in a restoration project accepted by DAFF.	LNG S025	–	Noted
329	Recommendations from the UNESCO World Heritage Committee meeting on the management of the GBRWHA (June 2012) should be applied and incorporated into the supplementary EIS. The EIS process should be suspended until receipt of these recommendations.	LNG S026 LNG S031	**SREIS** Attachment 2.	A detailed response is provided in Section 4.1 of Chapter 4, Part B of the SREIS.

Table 3.2 Issues register – Chapter 2: Project approvals (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
412	The *Local Government Act 2009* (Qld) and Local Laws from Gladstone Regional Council are also relevant to project use of local roads.	LNG S030	**SREIS** Attachment 1.	Noted.
424	Arrow's waste management plan should reference requirements under the *Waste Reduction and Recycling Act 2011* (Qld) and associated regulations.	LNG S030	–	A detailed waste management plan will be developed for the construction and operations stages of the project. The plans will incorporate the requirements of the Waste Reduction and Recycling Act and its associated regulations relevant to each stage of the project.
431, 437	Gladstone Regional Council has experienced the submission of multiple plans for approval (proponents and contractors) when the Coordinator-General approvals only envisaged a consolidated document. Often documents have been unclear and extend outside council's jurisdiction. Assessing these plans has exceeded council's funding allocations. The Coordinator-General should condition the proponent: (a) to ensure plans are relevant to the agency and consolidates all project aspects within a plan. (b) ensure its contractor's plans are consistent with approved plans by the agency. (c) pay reasonable costs where plans require resubmission.	LNG S030	–	Arrow Energy notes Gladstone Regional Council's (GRC) request to the Coordinator-General and acknowledges its concern regarding the effectiveness of processes for accepting and processing development applications, and management plans. Arrow Energy will work with GRC and its engineering, procurement and construction (EPC) contractor to promote efficiencies in the submission of management plans that address requirements relevant to GRC's jurisdiction.
436	In the event that Trains 3 and 4 proceed, all project plans must be reviewed and resubmitted at least six months prior to commencement of construction.	LNG S030	–	Noted.

Table 3.2 Issues register – Chapter 2: Project approvals (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
438	Why is the Qld government approving CSG industry applications when so many unanswered questions remain regarding the long term impact to our groundwater supplies and the long term impacts to the GAB caused from the procedure of fracking and chemicals used for this process.	LNG S031	–	Arrow Energy acknowledges that the issue raised relates to upstream coal seam gas development. Arrow Energy is pursuing approval for the Surat Gas Project under the Environmental Protection Act (1994) and is currently in the process of developing a SREIS that is separate to the SREIS for the Arrow LNG Plant. The Arrow Surat Gas Project SREIS will be subject to review by the Queensland Department of Environment and Heritage Protection and associated referral agencies.

Table 3.3 Issues register – Chapter 3: Project rationale

Issue No.	Issue	Submission No.	Response Reference	Comments
10	The EIS states that Surat and Bowen Basin CSG resources are suited for conversion to LNG for export, however LNG is an economically and environmentally inefficient means of transporting natural gas from Australia to North Asia.	LNG S003	–	The most efficient means of transporting gas when the cost of pipeline infrastructure becomes prohibitive is as LNG. LNG production and export is proposed due to the remoteness of target export markets, which are in North Asia.
11	Arrow Energy's vision to increase business value by commercialising coal seam gas reserves is based on the assumption the company can physically access CSG reserves. Groups who oppose CSG production can raise the financial risk for projects. This may in turn increase financial risk for downstream investment in LNG export infrastructure and by extension the value of Arrow Energy.	LNG S003	–	Noted.
12	International Energy Agency predictions show a global increase in the gas trade of about 80% by 2035. The submitter notes that forecasts see gas as a transitional fuel, which will give way to large scale renewables by 2035. Arrow Energy's investment in a single-energy source technology may be superseded before 2035. This could result in adverse effects on the regional economy.	LNG S003	–	The proportion of large scale renewables in Australia's energy future is dependent upon the capability of emerging technologies to provide baseload power in a cost-competitive manner. In terms of Australia's long-term energy future, the country is well placed as a major global supplier of LNG. Gas production driven by strong growth in the LNG trade is expected to increase nearly fourfold by 2034-2035, and there is also potential for substantial growth in demand (Commonwealth of Australia, 2012). LNG is seen as the key energy resource to facilitate the transition from non-renewable to renewable energies as it has lower emissions, is readily accessible, and able to provide baseload power (DRET, 2011). LNG also accounts for one quarter of global energy consumption, with trade expanding fivefold over the past two decades. This demand is projected to continue to increase particularly in the Asia-Pacific region (DRET, 2005).

Table 3.3 Issues register – Chapter 3: Project rationale (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
13	Investment should look toward multi-purpose, multi-fuel delivery infrastructure in order to have the flexibility for Australia to deliver whatever energy source international markets favour in future. The Arrow LNG Plant caters to a single export commodity. This is a flawed approach when considering the environmental sacrifices Arrow is asking the public to accept (i.e., industrialisation of Gladstone, risks to the Great Barrier Reef).	LNG S003	–	Noted.
14	The EIS notes that over 20% of the global population still lacks access to electricity. The nature of LNG facilities means they are limited to urban areas and LNG export to major cities does not solve this problem. A flexible network is superior to single-purpose LNG technology.	LNG S003	–	Noted.
15	The EIS does not address the questionable economic longevity of LNG from the perspective of the increasing industrialisation of Gladstone for short-term gain, or why LNG shipping would be preferable to constructing energy infrastructure to Asia. Proposed cross-country pipeline projects should be revisited in the context of LNG boom.	LNG S003	–	The most cost effective means of transporting gas when the cost of pipeline infrastructure becomes prohibitive is as LNG. LNG production and export is proposed due to the remoteness of target export markets, which are located in North Asia. For these reasons, the option of constructing a pipeline to deliver gas to overseas markets was not considered in development of the project.

Table 3.3 Issues register – Chapter 3: Project rationale (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
335	Explain the relevance of referring to domestic gas market as gas will be shipped overseas and is not for the domestic market.	LNG S026	**EIS** Chapter 27, Section 27.4.7. Appendix 21.	The EIS includes a discussion of the domestic gas market to provide background and an economic context for the project against which to assess potential economic impacts. In particular, and as the EIS Economic Impact Assessment in Appendix 21 notes, there are economic linkages between LNG export and the Australian gas market, including for gas prices. The assessment notes that increasing production of LNG for export may drive up the price of gas in the domestic market. Impacts on the domestic gas market, in particular the eastern Australian gas market are identified and discussed in EIS Chapter 27, Economics, Section 27.4.7.
336	Government should give higher priority to low carbon energy sources (such as solar thermal) above CSG. The negative environmental consequences of the project will be far greater than the short term economic gain (35 years).	LNG S026	–	Noted.

Table 3.4 Issues register – Chapter 4: Consultation and communication

Issue No.	Issue	Submission No.	Response Reference	Comments
31	Condition Arrow to consult with Queensland Police Service (QPS) (including the Water Police Gladstone, Gladstone District Disaster Management Group and Gladstone Regional Council Local Disaster Management Group as appropriate) in relation to the following: issues that involve traffic and transportation (including locations of centralised parking areas and launch sites) and development of the traffic management plan; all emergency management planning processes; compliance with the Queensland Counter-Terrorism Strategy (2011-2013); development of the shipping activity management plan and other maritime plans; and other disaster management planning. In relation to all plans, QPS requires information pertaining to each plan at least three months prior to the date the plan is intended to be finalised.	LNG S007	**EIS** Attachment 7, Section 3.6. Chapter 28, Section 28.5. Chapter 29, Section 29.6.	Where QPS is the relevant agency, the service will be consulted on the development of various safety and other management plans including but not limited to: • Traffic management plan. • Emergency management plan. • Maritime security plan (in the event that the Port of Gladstone is declared a security operated port and Arrow Energy a port facility operator under the Marine Transport and Offshore Facilities Securities Act 2003 (Cwlth)). • Security measures to comply with major hazard facility and Queensland Counter-Terrorism Strategy requirements. The timeline for providing information to QPS is noted. EIS Attachment 7 (SIMP Update), the SIMP Action Plan: Community Health and Safety (Section 3.6) describes Arrow Energy's actions in regard to emergency management, traffic management, and workforce-related matters, including liaison with emergency services. EIS Chapter 28 (Traffic and Transport) and Chapter 29 (Hazard and Risk) also describe Arrow Energy's commitments in terms of traffic and emergency management.
47, 48	What discussions have been held with the commercial fishing industry? Consultation processes amount to information sharing not consultation and the concerns of the local commercial seafood industry have not been taken into account in the EIS process.	LNG S012	**EIS** Appendix 30, sections 4.2.3 and 4.3.1.	A boating and fishing forum was held on 30 July 2011 at the Gladstone Campus of Central Queensland University. Groups invited to the forum represented commercial fishers and processors, marine advisory groups, recreational fishing groups, charter boat operators, recreational fishing groups, ferry service operators, boating groups and seafood wholesalers. The forum covered issues such as dredging, shipping, safety exclusion zones, recreational boating, marine life and fishing. The forum was attended by the Assistant Harbour Master for Gladstone, Gladstone Harbour's Chief Pilot, Arrow Energy's marine advisor, and 17 stakeholders representing a range of different interest groups. The Consultation Report, EIS Appendix 30, Section 4.2.3, provides further detail on the forum.

Table 3.4 Issues register – Chapter 4: Consultation and communication (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
253	The proponent should encourage its contractors to participate in a local marine operator user-group for construction vessel operators, which has been established.	LNG S021	**EIS** Chapter 4, Section 4.2.4. **SREIS** Chapter 2, Section 2.2.1.	The Gladstone Harbour Construction Vessels Scheduling and Safety Committee has been set up to address issues around the safe operation of harbour traffic during the construction of the various LNG projects. Participants in the committee include LNG proponents, contractors, Gladstone Ports Corporation and Maritime Safety Queensland.
319	Public awareness is needed for transparency of works. Inform communities of public facilities closures and exclusion zones prior to these areas being closed.	LNG S025	–	Arrow Energy will notify the public in advance of any public facility closures and/or the establishment of safety exclusion zones. Information on planned closures will be provided in a timely manner and in places or by means that ensure potentially affected stakeholders are kept informed. Details of specific notification requirements for different locations and activities will be set out in the management plans to be developed for the project such as the, traffic management plan for any land based closures and marine activity management plan. These management plans will be developed prior to project construction commencing.
338	Section 4.3.1 refers to an Environment Workshop. Provide a list of invitees and attendees.	LNG S026	**SREIS** Appendix 16, Section 2.1.	A list of Environment Forum invitees and attendees is provided in the Supplementary Consultation Report, SREIS Appendix 16, Section 2.1. Please note that the Environment Workshop discussed in EIS Chapter 4, Section 4.3.1 has been referred to as an Environment Forum within the SREIS (Appendix 16, Section 2.1).

Table 3.5 Issues register – Chapter 5: Assessment of alternatives

Issue No.	Issue	Submission No.	Response Reference	Comments
18	The EIS does not consider more efficient, flexible "future-proof" pathways to export energy (e.g., construction of energy infrastructure to Asia).	LNG S003	–	The most cost effective means of transporting gas when the cost of pipeline infrastructure becomes prohibitive is as LNG. LNG production and export is proposed due to the remoteness of target export markets, which are in North Asia. For these reasons, the option of constructing a pipeline to deliver gas to overseas markets was not considered in development of the project.
64	The proponent does not describe alternatives to the proposed project (Section 1.3.1). The proponent should summarise the benefits/disadvantages of taking/not taking the proposed action, especially the environmental benefits of the project not going ahead (e.g., less greenhouse gas emissions).	LNG S014	**EIS** Chapter 5, Section 5.6.	Alternatives to the proposed project have been addressed in the EIS in Chapter 5, Assessment of Alternatives. Negative and positive environmental, economic and social impacts of not proceeding with the project are discussed in the EIS in Chapter 5, Section 5.6.
210	GBRWHA and GBRMP were not excluded when undertaking an analysis of alternatives (refer: Chapter 5, Table 5.2). Waterways, wetlands and marine life may be harmed if more care is not taken with site selection. Consider alternative sites (possibly still within the Curtis Island area) so that contaminants, noise and lighting are further from the mouth of the harbour and out of GBRMP such that protected seagrass toward Southend and Rodds Bay, dugong habitat and protected turtle species are less likely to be affected.	LNG S020	**SREIS** Appendix 8, Section 5.1.2.	National (and marine) parks were excluded in the site selection process. The proposed LNG plant site on Curtis Island is not in the Great Barrier Reef Marine Park (GBRMP). The GBRWHA encompasses ports and strategic port land. Sites adjacent to existing industrial (port) developments were preferred over 'greenfield' sites. The proposed LNG plant site is in the Gladstone State Development Area Curtis Island Industry Precinct which was set aside by the Queensland Government to facilitate LNG development. The Arrow LNG Plant site while closer to South End than the other sites is the most distant site from the Great Barrier Reef Coast Marine Park (fish habitat protection zone) which extends north up The Narrows from a line between Laird Point on Curtis Island and Friend Point on the mainland. Indirect impacts to seagrass are discussed in the Marine Ecology technical report, SREIS Appendix 8, Section 5.1.2.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant

Issue No.	Issue	Submission No.	Response Reference	Comments
78, 258	Provide mapping showing the alternative locations (marina area / Auckland Point) and access roads to the pioneer launch site. Provide more detail regarding the proposed facility at Auckland Point taking into account all existing users. Temporary sites should be identified and assessed. Recommend including Alf O'Rourke Drive and Alf O'Rourke Drive/Bryan Jordan Drive intersection in assessment if marina is to be used for pioneer launch site and/or if launch site 1 is going to be accessed via Bryan Jordon Drive or Alf O'Rourke Drive. Acknowledge port roads to be used by the project.	LNG S017 LNG S021	**SREIS** Chapter 4, Section 4.7.1 Chapter 3, Sections 3.2 and 3.4. Appendix 13, Section 16.1.1.	Separate pioneer launch sites are being considered for personnel, materials and equipment, and bulk materials transport to and from Curtis Island. The options being considered as well as associated access roads and existing facilities at Auckland Point/Barney Point are discussed in SREIS Chapter 4, Project Description: LNG Plant, Section 4.7.1. Access options for launch site 1 are shown in Figure 3.3 in SREIS Chapter 3, Assessment of Alternatives Update, Section 3.4. Additional details for options for the pioneer launch site are provided in SREIS Chapter 3, Assessment of Alternatives Update, Section 3.2. Potential traffic impacts associated with use of each of the three mainland pioneer launch site options, including examination of the Alf O'Rourke and Bryan Jordan Drive intersection, are addressed in SREIS Appendix 13, Traffic and Transport Impact Assessment, Section 16.1.1.
77	Describe how propane will be transferred and stored on Curtis Island (including frequency of deliveries). What is the risk profile of using propane compared to LNG?	LNG S017	**EIS** Chapter 29, Section 29.4.1 **SREIS** Chapter 21, sections 21.2.1 and 21.5.1	Propane is a refrigerant used in the liquefaction process. The hazards and risks associated with the transfer and storage of propane are specifically outlined in EIS Chapter 29, Hazard and Risk, and SREIS Chapter 21, Hazard and Risk. For the operation of trains 1 and 2, approximately 2,300 m3 of propane will be held in storage tanks (fully pressurised spheres) located adjacent to the LNG storage tanks. This storage capacity will increase by 50% with the operation of trains 3 and 4. A propane import pipeline will be constructed from the Boatshed Point MOF to the propane storage area within the LNG plant site. The pipeline will transfer propane for the initial fill of the propane storage tanks and may also be used for more frequent top-ups of the storage tanks during LNG plant operation. Alternatively, more frequent top-ups may be undertaken through the use of ISOtainers. The Curtis Island construction camp and haul road on Boatshed Point will be evacuated as a precautionary measure during the initial fill prior to commissioning.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
79	Provide details on how temporary launch site would be used including material and personnel volumes (including aggregate and waste) and proposed, centralised car parking area. Conduct impact assessment on other marina users. The proponent must acknowledge GPC's stringent controls that would apply to the marina (e.g., all personnel bussed, no heavy vehicles, equipment materials and marshalling must be staged elsewhere, etc.)	LNG S017	**SREIS** Chapter 4, sections 4.7 and 4.8. Appendix 13, Chapter 5.	Separate pioneer launch sites are being considered for personnel, materials equipment, and bulk materials to be transported to and from Curtis Island. Details are provided in SREIS Chapter 4, Project Description: LNG Plant, Section 4.7.1. Estimates of personnel, materials and traffic volumes that may pass through or utilise pioneer facilities are set out in SREIS Chapter 4, Project Description: LNG Plant, Section 4.7.1 and Section 4.7.2, and SREIS Appendix 13, Traffic and Transport Impact Assessment, Chapter 5. Arrow Energy will continue to consult with Gladstone Port Corporation (GPC) and comply with standards and controls for use of the marina. Planned staging areas for personnel and materials are discussed in SREIS Chapter 4, Section 4.8.
81	Provide further information on the preferred pioneer materials offloading facility (MOF) site on Curtis Island (and the options being considered).	LNG S017	**SREIS** Chapter 4, Section 4.6.1	Further details on the preferred pioneer materials offloading facilities on Curtis Island are provided in SREIS Chapter 4, Project Description: LNG Plant, Section 4.6.1.
82	Section 6.7 nominates Hamilton Point South as the potential MOF and ferry terminal. Use of Hamilton Point South should be considered worst-case scenario due to significant impacts to Strategic Port Land.	LNG S017	**SREIS** Chapter 3, Section 3.1.	The Hamilton Point south MOF option has been discontinued as discussed in SREIS Chapter 3, Assessment of Alternatives Update, Section 3.1.
83	The EIS states that storm anchorages will be provided by Harbour authorities. Correct this statement. Harbour anchorages provided to date have been initiated by project proponents and are subject to availability.	LNG S017	–	Noted. Arrow Energy will discuss any requirements for storm anchorages with harbour authorities.
84	Adopt Gladstone Port Company's hierarchy for decommissioning of the LNG jetty, which includes firstly removal of the jetty and piles, followed by cutting off piles below the seabed and finally cutting off piles at the seabed.	LNG S017	**EIS** Chapter 6, Section 6.15.1	Decommissioning of the LNG jetty will take into account the GPC hierarchy for decommissioning and other accepted environmental standards in place at the time. Decommissioning of the jetty is discussed in EIS Chapter 6, Project Description: LNG Plant, Section 6.15.1.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
85	The construction shipping section assumes all major components can be delivered to the MOF. Provide further information regarding all potential uses of port facilities for receiving materials including pipeline delivery, pile deliveries, equipment and machinery. Include wharf facilities and laydown areas prior to distribution elsewhere.	LNG S017	**SREIS** Chapter 4, section 4.8. Chapter 7, Section7.1.2	SREIS Chapter 7, Project Description: Logistics, provides further details on the use of port facilities. In particular, Table 7.14 in Section 7.1.2 provides details on the use of port facilities for receiving materials. This section also discusses project requirements for laydown areas during the construction phase. SREIS Chapter 4, Project Description: LNG Plant provides details of pioneer facilities (Section 4.7), including the pioneer mainland launch site, pioneer MOF, pioneer landing sites on Curtis Island. Section 4.8 of that chapter provides details of staging areas for plant, equipment and machinery.
86	It is unclear in Section 6.13.3 how many fast ferries and ROPAX ferries are expected to moor at the launch site and MOF. Provide further details regarding ferries and moorings until permanent sites are operational. Assess the numbers of small ferries likely to be used and where from. Existing LNG projects utilise a significant number of vessels less than 15 m, which adds an additional 100-150 movements per day. Include information including vessels less than 15 m in length.	LNG S017	**EIS** Chapter 28, Section 28.4.5. **SREIS** Chapter 7, sections 7.1.1 and 7.2.1.	Preliminary estimates for the frequency of marine vessels were provided in EIS Chapter 28, Traffic and Transport in Section 28.4.5 and Table 28.18. Revised construction estimates for ferry and other vessel movements are provided in SREIS Chapter 7, Project Description: Logistics, in Section 7.1.1 and operational marine transportation requirements are provided in Section 7.2.1. Information regarding vessels less than 15 m in length will be generated following completion of the detailed design for the project.
92	Describe other project impacts on the Gladstone Marina, other than those during pre-construction phase.	LNG S017	–	Mission Landing at Gladstone Marina is being investigated as an initial pioneer launch site, as this facility has served this purpose for the other LNG projects. The mainland launch site will be a permanent facility providing for the project's construction and operation traffic. Once a permanent mainland launch site is constructed it is anticipated that there will be no ongoing need for the use of the pioneer launch sites.
103	Provide details of operating hours of proposed mainland sites.	LNG S017	**SREIS** Chapter 7, sections 7.1.1, and section 7.2.1.	This information is provided in SREIS Chapter 7, Project Description: Logistics, in Section 7.1.1, Table 7.3 for mainland construction sites and Section 7.2.1, Table 7.16 for mainland operational sites.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
110, 209, 383, 384, 388, 389	Provide further information on the locations and details of key infrastructure including the feed gas pipeline, launch site 1, the MOF and the desalination/sewage intake/diffuser lines to allow assessment of potential impacts on GRC, GAWB and GPC assets. Arrow should consult with GRC, GWAB and GPC and the Coordinator-General should condition the proponent to enter into discussions to ensure a joint solution is determined that allows for the needs of all parties to be met.	LNG S017 LNG S019 LNG S030	**SREIS** Chapter 4. Chapter 5.	Outcomes of the FEED study have resulted in some changes to project description as described in the EIS. This includes to the alignment of the feed gas pipeline, and the layout and design of both launch site 1, and the Boatshed Point MOF. Details of these changes and the revised layouts are included in SREIS Chapter 4, Project Description: LNG Plant and SREIS Chapter 5, Project Description: Feed Gas Pipeline. Figure 5.1 in SREIS Chapter 5 shows the revised alignment of the feed gas pipeline, whilst Figure 4.1 in SREIS Chapter 4 shows the revised LNG plant layout. Through the FEED process, the option to supply mains water to Curtis Island via a pipeline installed by Gladstone Area Water Board (GAWB) is now preferred. The project design incorporates existing infrastructure for the disposal of category A and category B waste through GRC's two sewer mains installed under Port Curtis. Arrow Energy has and will continue to consult with GRC, GAWB, GPC and the Coordinator-General on interactions between public and project infrastructure.
111	EIS should acknowledge that the land at Fishermans Landing Northern Expansion (FLNE) area is available should the proponent wish to use it. Land stability issues associated with the reclaimed land can be addressed at launch site 4N in a similar manner as reclaimed land at launch site 1. Other LNG proponents have already constructed facilities on reclaimed land at FLNE.	LNG S017	**SREIS** Chapter 4, Section 4.7.1.	Pioneer launch sites are discussed in SREIS Chapter 4, Project Description: LNG Plant, Section 4.7.1. Arrow Energy will establish a pioneer bulk materials launch site at Fishermans Landing on land adjacent to Australia Pacific LNG's mainland launch site, at the site of the old barge landing. Launch site 4N is located at the northern end of the Western Basin Reclamation Area, which is still under construction. The feasibility of launch site 4N will be dependent, in part, on the timing of completion of completion of the filling and stabilisation of the reclamation area.
112	Address TOR Section 2.1.2 Jetty and wharf facilities including details of ship loading/unloading; berths for tugs and other non-bulk carrier vessels.	LNG S017	**EIS** Chapter 6, Section 6.5. **SREIS** Chapter 4, sections 4.5 and 4.6.	EIS Chapter 6, Project Description: LNG Plant describes the LNG jetty and Boatshed Point MOF, including berths, loading platforms, monitoring structures and the mooring load monitoring system, operations monitoring system, and navigation and berthing aids (Section 6.5). SREIS Chapter 4, Project Description: LNG Plant identifies the changes to the design and layout of the Boatshed Point MOF (Section 4.5) and LNG jetty (Section 4.6). The revised MOF layout is shown in Figure 4.4 and LNG jetty in Figure 4.5.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
141	The EIS indicates approximately 100,000 to 250,000 m3 of water will be used for hydrostatic testing, with water sourced from the sea. If biocides such as chlorine are not removed (e.g., by dosing with sodium bisulfite) then a full chemical risk assessment for release of hydrostatic test water should be undertaken and a monitoring program developed. MSDS should be provided for all hydrostatic test water additives. Other potential impacts from releases such as erosion should also be risk-assessed.	LNG S018	**SREIS** Chapter 13, sections 13.2.1 and 13.4.5	The volumes of hydrostatic test water to be discharged to Port Curtis via the Boatshed Point outfall pipeline have been revised. These changes are described in SREIS Chapter 13, Marine Water Quality in Section 13.2.1. For three LNG tanks with 180,000 m^3 capacity, the worst-case total test volume to be used has been estimated at 360,000 m^3. Actual volumes will be less than 360,000 m^3 and the final volume, discharge rate and discharge location will be developed during detailed design. Biocides and oxygen scavengers may be used to eliminate organic deposits from the tanks. Hydrostatic test water will be tested and, if necessary, treated before discharge to receiving waters to meet applicable marine water quality criteria. The discharge of hydrostatic test water at the Boatshed Point outfall has been modelled and the results are presented in SREIS Chapter 13, Section 13.4.5.
149	The MOF at Boatshed Point extends the footprint of the project into an area that would otherwise not be impacted, with potential impacts from sediment plumes over seagrass beds to the east and threatened plants on Curtis Island. EHP recommends Hamilton Point as the preferred location for the MOF. Should Boatshed Point still be preferred, further detailed assessment of the options should be supplied.	LNG S018	**SREIS** Chapter 3, Section 3.1. Chapter 4, Section 4.5. Chapter 14, Section 14.2.1. Chapter 15. Appendix 8, Section 5.1.2.	Boatshed Point has been confirmed as the preferred location for the MOF and discussed in SREIS Chapter 3, Assessment of Alternatives Update; Section 3.1. SREIS Chapter 4, Project Description: LNG Plant identifies the changes to the design and layout of the Boatshed Point MOF (Section 4.5). The revised MOF layout is shown in Figure 4.4. SREIS Chapter 14, Coastal Processes, Section 14.2.1 discusses changes to dredging at the Boatshed Point MOF. Indirect impacts to seagrass such as turbidity and sedimentation are discussed in the Marine Ecology technical report, SREIS Appendix 8, Section 5.1.2 and summarised in SREIS Chapter 15, Marine Ecology.
182	The EIS has provided inadequate information on potable and non-potable water demands for the project, such as the volume of water required for hydrostatic testing of the feed gas pipeline and estimated wastewater generation. Provide further information of water requirements.	LNG S018	**SREIS** Chapter 4, sections 4.9 and 4.10. Chapter 13, Section 13.4.6	Updated information on the water demands and systems for the project is provided in SREIS Chapter 4, Project Description: LNG Plant, Section 4.9 and on wastewater in Section 4.10. The maximum volume of water required during hydrostatic testing of the feed gas pipeline and LNG tanks is expected to be 360,000 m^3. These changes are described in SREIS Chapter 13, Marine Water Quality in Section 13.4.6.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
208, 386	Proponent to be encouraged/conditioned to take up options for water supply and export of grey water/effluent into the GRC sewerage system through GAWB/GRC connections to Curtis Island. Proponent should enter into negotiations with GAWB/GRC to utilise these services.	LNG S019 LNG S030	**SREIS** Chapter 4, sections 4.9 and 4.10.	As described in SREIS Chapter 4, Project Description: LNG Plant, Section 4.9, water supply via the GAWB pipeline is now Arrow Energy's preferred water supply option. The option to develop a desalination plant has been retained. Domestic sewage and trade waste will be disposed of via the GRC Curtis Island sewerage system (Section 4.10). The option to develop a sewage treatment plant on site has also been retained.
217	Locating the LNG jetty at Hamilton Point (as Arrow proposes) is the best choice. This will help to minimize dredging and visual impacts by clustering sites together.	LNG S020	–	Noted. The LNG jetty will be located on Hamilton Point.
218	The Coordinator-General has stated that Hamilton Point is the preferred location for a possible common-user material offloading facility. Arrow's preferred site is at Boatshed Point, which will involve additional dredging, and therefore potential impacts on seagrass beds. Focus on plans and methods to lessen congestion on the shared MOF site at Hamilton Point.	LNG S020	**SREIS** Chapter 3, Section 3.1. Chapter 4.	The Hamilton Point South option for the MOF has been discontinued. The rational for the selection of the Boatshed Point location as the preferred option for the MOF and integrated personnel jetty is provided in SREIS Chapter 3, Assessment of Alternatives Update, Section 3.1. The option to use the GLNG Project pioneer MOF during Arrow LNG Plant early works and the GLNG MOF during construction and operations remain under consideration (see SREIS Chapter 3, Assessment of Alternative Update and SREIS Chapter 4, Project Description: LNG Plant).
219	Avoid the Calliope River Launch Site 1 option. Option 4N at the Western Basin Reclamation Area for the mainland launch site involves fewer environmental concerns. Option 4N reduces visual and traffic issues, there will be fewer boats crossing the coal shipping lanes near Wiggins, and dredging of shallow mud banks containing PASS resulting in potential impacts to fish passageways/species will be avoided.	LNG S020	**SREIS** Chapter 3, Section 3.4	Launch site 1 remains Arrow Energy's preferred mainland launch site. Launch site 4N remains as a project option, as discussed in SREIS Chapter 3, Assessment of Alternatives Update, Section 3.4). Launch site 4N is located at the northern end of the Western Basin Reclamation Area, which is still under construction. The feasibility of launch site 4N will be dependent, in part, on the timing of completion of the filling and stabilisation of the reclamation area, which is proceeding from south to north.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
220	With regard to the development of the Western Basin Reclamation Area (required for Mainland Launch Site Option 4N); can Arrow work with Western Basin operators to see that the reclamation works are completed on time?	LNG S020	–	Noted. Arrow Energy will continue discussions with relevant stakeholders in relation to the feasibility of launch site 4N.
233	Recommend that Hamilton Point MOF (second preference for MOF site) may not be feasible under the Hamilton Point Master Plan and Arrow should work with the Coordinator-General on this issue.	LNG S021	**SREIS** Chapter 3, Section 3.1	The Hamilton Point South option for the MOF has been discontinued. The rational for the selection of the Boatshed Point location as the preferred option for the MOF is provided in SREIS Chapter 3, Assessment of Alternatives Update, Section 3.1.
234	More information is required on tunnel construction activity and potential impacts on ship movements, dredging programs, etc.	LNG S021	**EIS** Chapter 7, Section 7.1 **SREIS** Chapter 5.	Tunnel construction is discussed in the EIS in Chapter 7, Project Description: Feed Gas Pipeline, Section 7.1. SREIS Chapter 5, Project Description: Feed Gas Pipeline provides an update on the alignment and construction of the tunnel. Tunnelling will have no impacts on ship movements or dredging programs in Port Curtis as the tunnel is excavated below the seafloor.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
267	Under the desalination plant option for water supply, Arrow Energy will need to determine whether they will be a drinking water service provider as regulated by the Water Supply (Safety and Reliability) Act 2008 and the Public Health Act 2005. If Arrow Energy is not a drinking water service provider, they will need to develop a management system to ensure that all potable water consumed on site complies with the Australian Drinking Water Guideline 2011 (ADWG). The supply of suitable water would come under the requirements of the Work Health and Safety Act 2011 and the Public Health Act 2005. Evidence will also be required of how Arrow Energy intends to protect drinking water from potential cross contamination from other water sources and waste streams on site.	LNG S022	**SREIS** Chapter 3, Section 3.7.	Supply of water to Curtis Island via a GAWB pipeline is now Arrow Energy's preferred water supply option, as discussed in SREIS Chapter 3, Assessment of Alternatives Update, Section 3.7. Should the desalination plant option be pursued, operations and the produced drinking water quality will meet the required Australian standards and guidelines.
331, 332	To reduce environmental impacts from dredging and infrastructure construction, the proponent should share as many facilities as possible with other LNG proponents. This includes the LNG jetty, MOF, personnel jetties, dredging, pipeline and service tunnels and mainland launch site.	LNG S026	**EIS** Chapter 5, Section 5.5. **SREIS** Chapter 3. Chapter 4.	Opportunities to co-locate infrastructure with the Queensland government and other LNG proponents were assessed in EIS Chapter 5, Assessment of Alternatives, Section 5.5. Studies carried out during FEED have explored further co-location opportunities. The option to use the GLNG Project pioneer MOF during Arrow LNG Plant early works and the GLNG MOF during construction and operations remain under consideration, as discussed in SREIS Chapter 3, Assessment of Alternatives Update; and SREIS Chapter 4, Project Description: LNG Plant.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
350, 352, 353	Aspects of the mainland tunnel launch site facilities and infrastructure appear to be situated on Lot 101. Tenement to Terminal Limited (3TL) has not been consulted and objects to Arrow using any part of Lot 101 for the project. In addition, proposed works by Arrow appear to extend beyond the boundary of Lot 102 and across the materials transportation and services corridor precinct. 3TL needs to have access to this corridor as it is the preferred option for three unloading conveyors transporting coal from the Mt Miller rail loop to the proposed stockyard on Lot 101.	LNG S028	**SREIS** Chapter 5, Section 5.2.	Infrastructure associated with the mainland tunnel launch site has been updated and will be located on Arrow Energy land. Further details are provided in SREIS Chapter 5, Project Description: Feed Gas Pipeline, Section 5.2 and shown on figures 5.1 and 5.2. Updated subdivision plans have been consulted during the detailed design phase for the project.
351	3TL notes the location of the proposed access road to the tunnel launch site. 3TL supports this option being the permanent route to site.	LNG S028	–	Noted.
380	Gladstone Regional Council understands the Ashpond 7 site has been discounted as a TWAF site. The proponent is encouraged by Council to incorporate the development and temporary use of Ashpond 7 (TWAF 7) as a car/bus interchange and/or lay down area to meet the project needs as well as provide a legacy infrastructure upgrade for the community.	LNG S030	**SREIS** Chapter 3, Section 3.5 Chapter 4, Section 4.8	TWAF 7, which is the former Gladstone Power Station No 7 ash pond located off Blain Drive, has been discounted due to legislated restrictions on the use of the former pond as an accommodation facility. TWAF 7 remains one of the options under consideration as a laydown and vehicle parking/staging area. See SREIS, Chapter 3, Assessment of Alternatives, Section 3.5 and Chapter 4, Project Description: LNG Plant, Section 4.8.

Table 3.6 Issues register – Chapter 6: Project description: LNG plant (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
385	Five sites have been identified which include Launch Site 1 at Calliope River and Launch Site 2 at Fishermans Landing. Launch Site 1 is relevant for impact on buried assets through Lot 69 on P4247. Launch Site 2 is relevant for potential impacts on GAWB's raw water network at Fisherman's Landing. The Coordinator-General should condition the proponent to enter into discussions with GRC, GAWB and GPC to ensure the needs of all parties are met at Launch Site 1 (Calliope River) site.	LNG S030	–	Arrow Energy has and is in ongoing discussions with GRC, GAWB and GPC on a range of issues, including the protection of buried assets.
387	Onsite gas turbine generators or power from the grid will supply electricity to the plant, utilities and ancillary facilities. GAWB and GRC are currently reliant on high-cost diesel generated power for sewage operations on Curtis Island. The Coordinator-General should condition the proponent to enter into negotiations with GAWB and GRC to allow connection to any power supply provided through the proposed tunnel.	LNG S030	**SREIS** Chapter 3, Section 3.6.	The mechanical and electrical option investigated during FEED is a variation on the configurations presented in the EIS. Known as Partial Auxiliary Import Power Mode, this option will provide power during the latter stages of construction and replace one gas turbine during operation. Power will be supplied via two high voltage electricity cables installed in ducts in two horizontal directionally drilled holes that will extend approximately 2.2 km from a point near the RG Tanna Coal Terminal to Hamilton Point on a similar alignment to the GAWB and GRC pipelines currently being installed for water supply and wastewater disposal respectively. This option is discussed in SREIS Chapter 3, Assessment of Alternatives, Section 3.6. Arrow Energy is engaged in ongoing discussions with GRC, and GAWB on a range of issues.

Table 3.7 Issues register – Chapter 7: Project description: Feed gas pipeline

Issue No.	Issue	Submission No.	Response Reference	Comments
235	Replace reference to Cement Australia Railway crossing with Fishermans Landing Branch Crossing.	LNG S021	**SREIS** Chapter 1.	Noted. The railway line is referred to as Fishermans Landing Branch Railway throughout the SREIS. The railway line is shown in Figure 1.1 in SREIS Chapter 1, Introduction.
236	Methodology for Fishermans Landing Branch crossing should specify standards of construction for pipeline with reference to AS4799 for pipeline crossings of railways.	LNG S021	–	The pipeline will be designed in accordance with AS2885 and any other applicable standards including, for example AS4799.
390	Section 7.7.1 notes up to 2ML of water may be required for dust suppression and other activities. The proponent is encouraged to enter into negotiations with GAWB on this supply.	LNG S030	**EIS** Chapter 4, Section 4.2.4.	Noted. Arrow Energy has participated in the Gladstone infrastructure working group forum which includes the GAWB. The forum considers a range of issues including the use of water supply infrastructure (see EIS Chapter 4, Consultation and Communication, Section 4.2.4). Arrow Energy is in advanced discussions with the Gladstone Area Water Board regarding water requirements for the project. The use of the GAWB water supply is now the base case for the Arrow LNG Plant.

Table 3.8 Issues register – Chapter 8: Project description: Dredging

Issue No.	Issue	Submission No.	Response Reference	Comments
50, 89	Provide further information and assessment on proposed maintenance dredging in the Calliope River, including potential disposal sites for dredge material.	LNG S012 LNG S017	**SREIS** Chapter 6, section 6.2 and 6.3. Chapter 15, Section 15.5.5. Appendix 7, Chapter 2, Section 2.1.5.	Further information on the maintenance dredging requirements for the project is provided in SREIS Chapter 6, Project Description: Dredging, within Section 6.2. Disposal of dredge spoil is also discussed within this chapter, in Section 6.3. Additional details are provided in SREIS Chapter 15, Marine Ecology, Section 15.5.5. SREIS Appendix 7, Coastal Processes and Marine Water Quality Technical Study presents the results of additional modelling carried out to assess maintenance dredging requirements for the project in Chapter 2, Section 2.1.5. The maximum dredge volume estimated for the Calliope River dredge site is up to 900,000 m^3. A cutter suction dredger is most likely to be used at this site. Excavated material will be pumped via a submerged temporary delivery line and temporary overland delivery pipeline to the Wiggins Island Coal Export Terminal (WICET) disposal Area B and Area C or to the approved East Banks Sea Disposal Site.
76	EIS nominates up to five dredge sites (1 LNG jetty, 2 MOFs, 2 Mainland Launch Sites). Concerned this is inconsistent with other statements that 1 LNG Jetty, 1 MOF and 1 Mainland Launch site is required for the project.	LNG S017	**SREIS** Chapter 6.	Noted. The EIS identifies dredging associated with one LNG jetty site at Hamilton Point, two options for the MOF and two options for the mainland launch site. SREIS Chapter 6, Project Description: Dredging provides further information on these project dredge sites.
87, 144	Inadequate detail is provided on the dredge method. Provide further information on the transportation of dredged material via pipeline from Launch Site 1 to the Western Basin Reclamation Area. Include alternative routes for pipeline, how material can be pumped, assess dredging on other Calliope River users including WICET. GPC also considers the estimated 3-4 weeks for dredging this area to be unrealistic.	LNG S017 LNG S018	**SREIS** Chapter 6.	SREIS Chapter 6, Project Description: Dredging provides further information on proposed dredging at each project site, including in the Calliope River to provide access to launch site 1. Arrow Energy has reviewed dredge methods and spoil disposal requirements for each site and potential dredge spoil disposal locations. The disposal of dredge spoil from each of Arrow Energy's dredge locations, including transport options, are identified in SREIS Chapter 6. This chapter also provides revised estimates of the duration of effective dredging for all sites. Arrow Energy has consulted with the GPC and other relevant stakeholders including the WICET project proponents in developing the proposed options. Full details of the dredge method, including measures to limit impacts on users at each site, will be included in the dredge management plan.

Table 3.8 Issues register – Chapter 8: Project description: Dredging (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
88	Provide further information on Boatshed Point MOF and Ferry Terminal to assess dredging requirements. Include clear maps, material volumes, modelling based on sediment data for full extent of dredging, and potential to encounter rock.	LNG S017	**SREIS** Chapter 6. Chapter 12, Section 12.5. Chapter 13. Chapter 14. Chapter 15.	The dredging proposed at Boatshed Point is described in detail in SREIS Chapter 6, Project Description: Dredging. Detailed information on sediments at Boatshed Point, including discussion on the potential to encounter rock, is contained in SREIS Chapter 12, Sediment Characterisation, Section 12.5. Potential impacts on water quality, coastal processes and marine ecology of dredging at this site are addressed in SREIS Chapter 13, Marine Water Quality, SREIS Chapter 14, Coastal Processes, and SREIS Chapter 15, Marine Ecology respectively.
90	There is insufficient information relating to alternative dredge material disposal sites. Note there is no capacity available at the East Banks Sea Disposal site due to existing capital dredging commitments.	LNG S017	**SREIS** Chapter 6, Section 6.3.	Arrow Energy has reviewed the dredge spoil disposal requirements for the project, including a range of feasible options in the vicinity of the dredge sites. The proposed sites for disposal of dredge spoil from each of Arrow Energy's dredge locations are identified in SREIS Chapter 6, Project Description: Dredging. Arrow Energy has consulted with the GPC and other relevant stakeholders in developing these options.

Table 3.8 Issues register – Chapter 8: Project description: Dredging (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
139	The EIS states the National Assessment Guidelines for Dredging (NAGD) are not relevant to the assessment on the basis that dredge spoil will be placed in the Western Basin Reclamation Area. The proponent should note that the NAGD methodology not only provides for sediment quality assessment information for the purposes of oceanic disposal, but also alerts land based disposal strategies to the potential contaminants of concern in decant waters. In the absence of sediment elutriate and toxicant bioavailability information, decant waters may need to be monitored more regularly and for a wide suite of contaminants. Where sensitive receptor sites receive greater than baseline deposition rates from dredge sediment, dissolved metal and metalloid characterisation of waters may need to be included in the receiving environment monitoring plan (REMP).	LNG S018	**SREIS** Chapter 6, Section 6.3. Chapter 12. Appendix 7.	Arrow Energy has reviewed the dredge spoil disposal requirements for the project, including a range of feasible options in the vicinity of the dredge sites (in addition to the Western Basin Reclamation Area). The proposed sites for disposal of dredge spoil from each of Arrow Energy's dredge locations are identified in SREIS Chapter 6, Project Description: Dredging, in Section 6.3. All options for dredge disposal have the required approvals. Management of these sites, including of decant water, will be carried out in accordance with the approval conditions for each site. Arrow Energy has carried out additional sediment sampling as part of a wider geotechnical drilling program in the vicinity of proposed dredge sites. The geotechnical program was undertaken to meet the requirements of the National Assessment Guidelines for Dredging 2009 (NAGD, 2009) and will be completed before the application for a dredging permit. The preliminary results of this sampling are presented in SREIS Chapter 12, Sediment Characterisation and have been used to update hydrodynamic modelling carried out at dredge sites (see Appendix 7 of the SREIS, Coastal Processes).
150	The reduced depth of the Calliope dredged channel (4.5 m; least possible depth) will generate considerable stirring of the bed while fully laden barges progress through the channel, causing elevated turbidity levels. Depths of all channels should be sufficient to minimise resuspension from vessel movement.	LNG S018	**SREIS** Chapter 6.	Noted. The proposed Calliope River dredging footprint (including depth) has been designed to allow for sufficient under keel clearances of the barges and project vessels. The clearances allow for all tide access to the mainland launch site 1 in the Calliope River. The SREIS contains further details on the Calliope River dredging in Chapter 6, Project Description: Dredging.

Table 3.8 Issues register – Chapter 8: Project description: Dredging (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
333	Turbidity has been a recent serious concern. Seek alternative locations for marine facilities to avoid additional dredging of the Calliope River. Removal of 1 million cubic metres of sea and river bed would impact directly upon estuarine and marine ecosystems, fish habitat, dugong habitat, seagrass beds, benthic flora & fauna and other marine fauna (including turtles and dolphins). Cumulative impacts will be unacceptable. Give preference to MOF and personnel launch facility at Fisherman's Landing.	LNG S026	**EIS** Chapter 5. Chapter 6. Chapter 15. Chapter 16. Chapter 19. **SREIS** Chapter 12. Chapter 13. Chapter 14. Chapter 15. Chapter 17.	Options for siting the mainland launch site were developed through a comprehensive site selection process. The alternatives are discussed in EIS Chapter 5, Assessment of Alternatives and in Chapter 6, Project Description: LNG Plant. The EIS provided an assessment of the potential impacts of dredging in the Calliope River on a range of environmental values including marine water quality (Chapter 16), coastal processes (Chapter 15) and marine and estuarine ecology (Chapter 19). Additional work has been undertaken for the SREIS to further understand the potential impacts of dredging, including water and sediment sampling and ecological surveys. Hydrodynamic and siltation modelling has also been completed, using updated data and information on the river. The results of these further assessments are included in SREIS Chapter 12, Sediment Characterisation, Chapter 13, Marine Water Quality, Chapter 14, Coastal Processes, Chapter 15, Marine Ecology and Chapter 17, Estuarine Ecology (Calliope River).
430	Dredging of the Calliope River by the proponent will mean GRC has to revisit its flood modelling. The Coordinator-General should condition the proponent to cover GRC's costs for updating flood studies.	LNG S030	–	Noted.

Table 3.9 Issues register – Chapter 11: Geology, landform and soils

Issue No.	Issue	Submission No.	Response Reference	Comments
113	Address TOR Section 2.3.2.3 Disposal of dredge material from Curtis Island facilities including characteristics of spoil disposal areas; physical and chemical qualities of dredged materials; and management of dredged material disposal areas during disposal operations.	LNG S017	**EIS** Chapter 16. **SREIS** Chapter 6, Section 6.3. Chapter 12, sections 12.4 and 12.5.	An update on dredging requirements for the project including proposed dredge material disposal areas is provided in the SREIS in Chapter 6, Project Description: Dredging. All dredge disposal sites identified in the SREIS are previously approved disposal sites. The management of dredged material disposal areas is discussed in Section 6.3. All options presented in this section utilise licensed dredge disposal areas. In the EIS (Chapter 16, Marine Water Quality and Sediment), Arrow Energy committed to obtain further information on sediments to be dredged through analysis of samples from cores taken as part of the project's geotechnical drilling program. The drilling program was undertaken between August and November 2012. SREIS Chapter 12, Sediment Characterisation presents the results of the sampling and analysis. Details of the sampling carried out, including sampling sites, are contained in Section 12.4 and the physical and chemical qualities of dredge materials are discussed in Section 12.5.

Table 3.9 Issues register – Chapter 11: Geology, landform and soils (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
140, 169, 223, 224, 225, 230	Insufficient information has been presented on the impacts of acid leaching on the marine environment. Further details are needed on the ASS/PASS potential at all project sites (such as at dredge sites and the tunnel launch site) including results of coring, proposed disposal methods, and management. Arrow should not be allowed to send PASS material to the reclamation area and alternative dumping sites should be identified. Water quality monitoring should use the baseline metal data levels from prior to more recent developments. Acid Sulfate Soil Management Plans for various project components should meet SPP 2/02.	LNG S018 LNG S020	**EIS** Chapter 12, Section 12.5.2. Chapter 16, Section 16.2.2. Appendix 4. **SREIS** Chapter 12, sections 12.4.2 and 12.5	The EIS addressed ASS/PASS through a specific technical study (Appendix 4, Acid Sulfate Soil Impact Assessment) and presented potential impacts of acid sulphate soils (ASS) on the marine environment in EIS Chapter 16, Marine Water Quality and Sediment. Management of ASS is discussed in EIS Chapter 12, Land Contamination and Acid Sulfate Soils, Section 12.5.2. The assessment concluded that additional site-specific acid sulfate soils investigation was needed for some sites to aid the development of specific management plans. Arrow Energy undertook a geotechnical drilling program at project sites between August and November 2012, which included sampling and analysis for the presence of acid sulfate soils. The preliminary results are presented in SREIS Chapter 12, Sediment Characterisation (Section 12.5) and are consistent with the findings of the desktop study performed for the EIS. Arrow Energy committed in the EIS to develop an ASS management plan prior to construction commencing (Chapter 12, Land Contamination and Acid Sulfate Soils). The plan will specify how onsite ASS disturbances are to be managed in accordance with SPP2/02 and the methods set out in Queensland acid sulfate soils technical manual soil management guidelines (Dear et al., 2002).
222	Launch Site 4N does not seem to have been assessed for soils.	LNG S020	–	Launch site 4N will be established on reclaimed land and does not exist yet. As such, no soil assessment was undertaken for the EIS. If this option is taken forward by Arrow Energy, GPC will be consulted to obtain details of the characteristics of the fill materials used for land reclamation at launch site 4N.

Table 3.10 Issues register – Chapter 13: Surface water hydrology and water quality

Issue No.	Issue	Submission No.	Response Reference	Comments
19	Explain how 1% AEP was determined to be an appropriate level of flood immunity for the project. Identify location of storage sites for hazardous materials with reference to the 1% AEP flood event and medium to high bushfire hazard areas. Demonstrate flood hazard provisions in SPP1/03 Guideline can be achieved at the TWAF sites. The proponent is advised to undertake a more detailed flood study to ensure infrastructure is located above the appropriate flood immunity level; the project is designed and constructed to exclude floodwater intrusion; and the project is able to resist hydrostatic forces as a result of inundation.	LNG S004	**EIS** Chapter 10, Section 10.1.2. Chapter 29, Section 29.4.1.	Appendix 2 of SPP 1/03 states that the 1% AEP flood has been accepted as the preferred 'defined flood event' with little assessment of the consequences of larger, less frequent floods. In addition, as described in EIS Chapter 10, Climate and Climate Change Adaptation, Section 10.1.2, Annex 3 of the Queensland Coastal Plan sets assessment factors for determining storm-tide inundation areas, which includes adoption of the 100-year ARI extreme storm event or water level. The 100-year average recurrence interval (ARI) is equivalent to the 1% AEP, so the level of flood immunity is consistent for coastal and watercourse flood events. As described in EIS Chapter 29, Hazard and Risk (Section 29.4.1, Table 29.4), waterway diversions, associated flood corridors and plant layout will be designed to manage a minimum of a 100-year ARI flood event to comply with SPP1/03 so that storage sites for hazardous materials are provided appropriate levels of immunity from flood and bushfire hazards. Detailed flood risk assessments will be carried out once TWAF selection has been determined, prior to construction. These will assess flood risks and aid design and management measures in order to comply with SPP 1/03.
126	Correctly reference the remit of the Water Resources (Calliope River Basin) Plan 2006, and reference the Calliope River Basin Resource Operations Plan 2006 in Section 13.1.2. Discuss the potential impacts of the development on the outcomes of the plan, particularly "to maintain adequate freshwater outflows to The Narrows and the natural wetlands in the plan area".	LNG S018	–	The project proposes no direct extraction of water from resources within the Calliope River Basin. The project proposes no activity that is likely to impact on the freshwater outflows to The Narrows. Where Arrow Energy proposes facilities such as launch sites and temporary workforce accommodation facilities (TWAFs) potential contamination to freshwater resources will be managed through appropriate environmental controls that will be fully detailed in a statutory EM Plan to be submitted at the time of application for environmental authority to conduct Environmentally Relevant Activities.

Table 3.10 Issues register – Chapter 13: Surface water hydrology and water quality (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
127	Clarify whether any dams will be required for storage. Any overland flow dams constructed within the Calliope River Basin Catchment must be constructed in accordance with the Calliope Water Resource (Calliope River Basin) Plan 2006.	LNG S018	**SREIS** Chapter 4.	The project does not include construction of any dams in the Calliope River Basin Catchment. Within the Curtis Island drainage basin, a drainage channel that currently flows to the north western corner of the LNG plant site will be diverted to an existing channel to the west of the site (see SREIS Chapter 4, Project Description: LNG Plant, Figure 4.7). A structure will be installed on that channel (outside the north western corner of the LNG plant site) to regulate flows and prevent downstream scouring and erosion. Stormwater from the hard stand areas of the LNG plant will be retained to maintain a source of supply of initial fire fighting water. No other dams are planned on the LNG plant site or mainland facilities.
128	Section 13.2.1 of the EIS incorrectly states that "the water quality objectives for Port Curtis as defined in the EPP (Water) were used to develop..." Currently, there are no water quality objectives for Port Curtis in the EPP (Water) 2009. Consequently, ANZECC/ARMCANZ guidelines act as default objectives. Amend statement.	LNG S018	**SREIS** Chapter 13. Chapter 14.	Noted. ANZECC/ARMCANZ guidelines have been referred to where relevant in the SREIS. See in particular, SREIS Chapter 13, Marine Water Quality and SREIS Chapter 14, Coastal Processes.
129, 175	There is no specific consideration of the impacts on environmental values for waters as specified in the Environmental Protection (Water) Policy 2009. Provide information on environmental values for surface waters and assess impacts of the project on these values at each location within the project area. Include impacts on surface water users and on beneficial uses. If impacts are significant, mitigation should be proposed.	LNG S018	**EIS** Chapter 13, sections 13.3, 13.4 and 13.8. Chapter 16, sections 16.2.2 and 16.8. Chapter 26, Section 26.5.8.	A detailed response is provided in Section 4.2 of Chapter 4, Part B of the SREIS.

Table 3.10 Issues register – Chapter 13: Surface water hydrology and water quality (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
130	Adequate details of a surface water quality monitoring program and auditing process are not provided (e.g., releases from operating vehicles, flooding, storm water, spills, wind transportation of dust), and a program should be developed using relevant indicators from the Queensland Water Quality Guidelines that addresses potential impacts and outlines actions to be taken if water quality objectives are not met.	LNG S018	**EIS** Chapter 13, Section 13.7.	A number of detailed site environmental monitoring programs and management plans will be developed for the project during detailed design, prior to construction commencing. Inspection and monitoring measures proposed for surface water during construction and operations are discussed in EIS Chapter 13, Surface Water Hydrology and Water Quality, Section 13.7. Surface water monitoring will reflect the project approval requirements directed by government departments, and will utilise relevant indicators and appropriate criteria such as the Queensland Water Quality Guidelines.
131, 341	Inadequate information is provided on baseline water quality in the permanent and ephemeral streams on the mainland and Curtis Island. The proponent should collect 2012 water quality data for all potentially impacted ephemeral and permanent waterways on the mainland and Curtis Island, including Calliope River freshwater and estuarine environs (particularly from wet season for ephemeral creeks on Curtis Island). Data should be collected to assist development of suitable TSS and turbidity limits for the construction stage.	LNG S018 LNG S026	**EIS** Chapter 13, Section 13.2.1. Appendix 5. **SREIS** Chapter 13. Appendix 5.	A detailed response is provided in Section 4.2 of Chapter 4, Part B of the SREIS.
132	Table 13.12 does not cover all parameters relevant to the area in the Queensland Water Quality Guidelines and should include potential contaminants in the storm water. The objectives in Section 13.7.2 do not give actual values to show how management will meet objectives. The EIS should contain quantified information and actual values.	LNG S018	**EIS** Chapter 13, Section 13.7.2. Chapter 31, Section 31.4. Appendix 6.	A detailed response is provided in Section 4.2 of Chapter 4, Part B of the SREIS.

Table 3.10 Issues register – Chapter 13: Surface water hydrology and water quality (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
174	LNG plant construction will require at least one ephemeral stream on Curtis Island to be filled in. Propose an appropriate offset for this impact in the supplementary EIS, such as protection of an ephemeral stream elsewhere, or an offset payment.	LNG S018	_	Topographical features on the LNG plant site on Curtis Island that are related to surface water are best described as being associated with overland flow. Whilst maps of the area show a limited number of class 1 streams and one class 2 stream, physical inspections by specialist hydrologists (Alluvium Consulting) and specialist aquatic ecologists (Ecosure (formerly Aquateco)) confirmed that these maintain no environmental values as freshwater or estuarine aquatic habitat. DERM (now DEHP) has advised that these unnamed creeks are not watercourses as they do not exhibit the essential characteristics of a watercourse such as an extended, if non-permanent, period of flow and the flows do not benefit or support rural or commercial activity beyond the basic needs of a single property (DERM, Feb 2011). Offsets are therefore not proposed for impacts on this drainage system.
181	There is a lack of information about the waterway crossings that may be required at TWAF 8. Provide an assessment of proposed stream crossings including crossing location, bank profile, stream flow, water condition and justification for the proposed crossing method. Assessment must address the environmental values at crossing sites. Water quality impacts should also be considered.	LNG S018	**EIS** Chapter 13, sections 13.3, 13.4 and 13.5. Chapter 18, sections 18.4 and 18.5.	The only watercourse in the vicinity of TWAF 8 is Targinie Creek. This watercourse is ephemeral in nature and only flows following rainfall events. As outlined in EIS Chapter 13, Surface Water Hydrology and Water Quality (Section 13.3) Targinie Creek was assessed as having a low sensitivity in terms of its environmental value. Service pipelines, security fences, and access tracks will cross the upper reaches of the creek with limited associated works. The impact of these crossings on the values of the creek was assessed in EIS Chapter 13, and Chapter 18, Freshwater Ecology (Sections 13.4 and 18.4). Several mitigation measures were proposed in the EIS (Sections 13.5 and 18.5) to limit the impacts of any waterway crossing on the creek. TWAF 8 remains as a project option for workers accommodation, staging and laydown. Detailed design of any waterway crossings required at this site will be included in environmental management plans provided at the time of application for appropriate environmental authorities.

Table 3.10 Issues register – Chapter 13: Surface water hydrology and water quality (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
315, 316, 317	Streams and creeks affected by the project, including Targinie Creek, will be re-evaluated by DAFF for waterways status under the Fisheries Act 1994 prior to work commencing to ensure the correct approvals are applied for.	LNG S025	**EIS** Chapter 13, sections 13.3, 13.4 and 13.5. Chapter 18, sections 18.4 and 18.5. Appendix 11.	A detailed response is provided in Section 4.2 of Chapter 4, Part B of the SREIS.
339	Regarding controlled discharge facility and observation pond, the EIS must: 1. Identify water quality parameters and contaminants which will be monitored in the controlled discharge facility and observation pond prior to discharge, and trigger levels that will be used to identify release limits for each parameter and contaminant. 2. Identify contaminants that the treatment plant can remove or lower. For run-off water which is diverted to the treatment plant, identify how water quality parameters and contaminants will be measured after treatment, prior to discharge.	LNG S026	**EIS** Chapter 16. **SREIS** Chapter 4.	A detailed response is provided in Section 4.2 of Chapter 4, Part B of the SREIS.
340	Amend Section 13.1.2 of EIS to include the updated 2009 Environmental Protection Policy (Water) which uses the environmental values and water quality objectives for the Fitzroy Basin as a guide. Until draft values and water quality objectives are available for the Boyne and Calliope Rivers and Curtis Island, EIS should refer to those for the Fitzroy Basin waters.	LNG S026	**EIS** Chapter 13. Appendix 5.	Noted. While not specifically referenced, the Environmental Protection Policy (Water) 2009 was referred to and used in the development of the Surface Water Impact Assessment (Appendix 5) of the EIS on which EIS Chapter 13, Surface Water Hydrology and Water Quality, is based.

Table 3.10 Issues register – Chapter 13: Surface water hydrology and water quality (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
342	Table 13.8 and Chapter 13 (Surface Water Hydrology and Water Quality) should consider the World Heritage values of the Great Barrier Reef identified in 1981. Any values identified for the Curtis Coast area in UNESCO, UNEP or Australian or Queensland Government documents during this time should also be identified, referenced and utilised.	LNG S026	**EIS** Chapter 13, Section 13.3.5. Appendix 5.	International, national and state agreements, legislation and policy relevant to establishing the values of surface water in the project area were integral to methodology used in the surface water impact assessment completed for the EIS (Appendix 5, Surface Water Impact Assessment). These documents are listed and discussed in the assessment. The assessment identifies surface water values related to international and national conservation status (e.g., Great Barrier Reef World Heritage Area, Marine Park and wetlands listed in the Directory of Important Wetlands) as well as those with status on a state level. In particular, the Environmental Protection (Water) Policy 2009 environmental values were considered when identifying surface water values for the project area (EIS Chapter 13, Surface Water Hydrology and Water Quality, Section 13.3.5). The sensitivity of these values was determined on the condition of the catchments, watercourses and wetlands in each location.

Table 3.11 Issues register – Chapter 14: Groundwater

Issue No.	Issue	Submission No.	Response Reference	Comments
133	No registered groundwater entitlements are allocated within the study area but this is inevitable as groundwater is not regulated in the study area. Remove this statement.	LNG S018	_	Noted.
134	Inadequate details of the groundwater monitoring program are provided in Section 14.7.2 of the EIS and Section 8.2.2 of Appendix 7. In order to provide a baseline, planning and implementation should be undertaken before production commences. It is also unsatisfactory that most existing monitoring bores monitor the shallow aquifer. A monitoring program should be developed that adequately monitors the mainland and island areas of development. Baseline data should be collected prior to plant construction.	LNG S018	**SREIS** Attachment 5.	A detailed response is provided in Section 4.3 of Chapter 4, Part B of the SREIS.

Table 3.11 Issues register – Chapter 14: Groundwater (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
177	The EIS does not evaluate the water quality impacts on groundwater for each environmental value that is considered relevant. There is also inconsistent reference to one of the classes of groundwater environmental values. Assess all environmental values in accordance with section 6 of the EPP (Water) including: aquaculture; aquatic ecosystems; cultural and spiritual values; farm supply and agricultural purposes; industrial use; irrigation and stock watering. Provide this assessment in three different parts: mainland site, project area under the channel, and the LNG site on Curtis Island. The department considers that the following environmental values do not need to be assessed: water used for producing aquatic foods for human consumption; primary recreation; secondary recreation; and visual appreciation.	LNG S018	**EIS** Chapter 14, sections 14.2.2 and 14.4. Appendix 7, Section 5.1.1.	A detailed response is provided in Section 4.3 of Chapter 4, Part B of the SREIS.

Table 3.11 Issues register – Chapter 14: Groundwater (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
178	There is no discussion on potential seawater intrusion into coastal aquifers which may occur if water tables are lowered. Identify and discuss potential points of intrusion, including impacts and proposed mitigation measures.	LNG S018	–	Project mechanisms for the creation of potential seawater intrusion are extremely limited to non-existent. No extraction of groundwater that will lower water tables is planned at any of the project sites. Civil engineering works (cut and fill) on the LNG plant site on Curtis Island may intersect shallow groundwater aquifers that lie in unconsolidated sediments on top of the bedrock. The ground level surface in the area of the plant footprint is to be lowered and any intersected groundwater will be diverted by means of a table drain. The ground surface level will remain above sea level. There is no foreseeable mechanism for intrusion. Civil engineering works at the mainland sites will not generate a mechanism for seawater intrusion. The tunnel under Gladstone Harbour will intersect groundwater aquifers as the tunnel shaft is excavated to depth. A dry installation technique will be used, which seals off connectivity with permeable strata, as the installation progresses. The amount of dewatering required is accordingly minimised and only the water initially encountered within the tunnel shafts should require extraction. Because the tunnel then represents a 'dry cavity' below ground, there will be negligible ongoing extraction of entrained water. There remains no ongoing mechanism for seawater intrusion as a result of project activities.
183	The locations of project infrastructure need to be shown in Figures 14.3 and 18.1 to enable quick identification of the proposed developments in relation to groundwater risk areas and the freshwater ecology study area.	LNG S018	**EIS** Chapter 14. Chapter 18. **SREIS** Chapter 4.	The project area which encompasses all project infrastructure is shown EIS Chapter 14, Groundwater within Figure 14.3; and EIS, Chapter 18, Freshwater Ecology, Figure 18.1. Only the project area is shown within these figures in the EIS as detailed infrastructure could not be captured at this scale. Changes associated with the LNG plant and ancillary infrastructure as a result of FEED are discussed within the SREIS Chapter 4, Project Description: LNG Plant. Figure 4.2 within that chapter shows the revised layout of ancillary infrastructure of the LNG Plant as compared to that presented in the EIS.

Table 3.12 Issues register – Chapter 15: Coastal processes

Issue No.	Issue	Submission No.	Response Reference	Comments
35, 98, 117	Query the accuracy of the model that predicts a 0.8 m drop in sea level at the mouth of the Calliope River and lack of impact assessment associated with such a large drop. Revisit model predictions and compare studies to those conducted by other proponents. Specify exactly where in the Calliope River impacts may be experienced, including potential impacts of river flooding or adverse weather events that may affect use of Launch Site 1 and impacts on estuarine species. Identify management strategies to mitigate disruption to project activities.	LNG S010 LNG S017	**SREIS** Chapter 14. Chapter 17. Appendix 7. Appendix 10.	A detailed bathymetric survey was completed on the Calliope River and these results were used in the further hydrodynamic modelling that has been carried out to provide information on potential impacts from the proposed dredging program in the Calliope River on extreme low tide levels within the river. The results of this modelling can be found in Appendix 7, Coastal Processes and are summarised in SREIS Chapter 14, Coastal Processes. The modelling predicts minor changes in low tide levels for several points in the river. Detailed information on the changes in the time of exposure of intertidal river banks and potential impacts on the ecology of the river, including for benthic and mangrove species, are discussed in Appendix 10, Estuarine Ecology (Calliope River), and summarised in SREIS Chapter 17, Estuarine Ecology (Calliope River).

Table 3.13 Issues register – Chapter 16: Marine water quality and sediment

Issue No.	Issue	Submission No.	Response Reference	Comments
102, 116, 136	Provide information on the characteristics of sediment at dredge sites including analysis of physical and chemical properties, and acid sulfate soils, as per the Terms of Reference. Data points should satisfy requirements of ANZECC/ARMCANZ (2000) guidelines. Detail the proposed treatment of ASS and the dredge disposal options, including management of dredged material during disposal operations and decant water quality monitoring requirements.	LNG S017 LNG S018	**SREIS** Chapter 6, Section 6.3. Chapter 12, sections 12.1.1 and 12.5.	A detailed response is provided in Section 4.4 of Chapter 4, Part B of the SREIS.
135	There is insufficient water quality data for the purpose of determining locally derived physiochemical water quality objectives and baseline values in the EIS. EHP considers February 2011 data at sites 1 and 6 may have been flood affected and is therefore not representative of baseline. Adequate baseline data is imperative to inform the dredge management plan and receiving environment monitoring program, and the proponent should follow the ANZECC/ARMCANZ guidelines, which advocate 24 data points collected monthly over 2 years to adequately represent seasonality. Additional water quality data should be sourced from GPC or other companies, or be collected by the proponent to satisfy the recommendations in QWQGs and ANZECC/ARMCANZ (2000).	LNG S018	**SREIS** Chapter 13, sections 13.3.2, 13.3.3 and 13.4	A detailed response is provided in Section 4.4 of Chapter 4, Part B of the SREIS.

Table 3.13 Issues register – Chapter 16: Marine water quality and sediment (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
138	Referencing to ANZECC/ARMCANZ toxicity based trigger values is incomplete in relation to low and moderate reliability trigger values. Refer to Section 8.3 of the ANZECC/ARMCANZ (2000) guidelines for interim working levels and update Table 16.3 Marine Water Quality Criteria in the EIS.	LNG S018	**SREIS** Chapter 13, Section 13.3.3.	The marine water quality criteria developed for the project were developed by Central Queensland University (CQU) and took account of relevant guidelines including ANZECC/ARMCANZ (2000) and Queensland water quality guidelines. As discussed in SREIS Chapter 13 Marine Water Quality, Section 13.3.3, use of the ANZECC/ARMCANZ (2000) interim working levels were discounted due to limited data.
142	The EIS does not provide details of the sediment and analysis plan referred to in Section 16.5.1. The sediment analysis plan should be provided to EHP for review before the commencement of geotechnical investigations.	LNG S018	**SREIS** Chapter 12	Arrow Energy has consulted with DEHP regarding dredging and the associated geotechnical program, and the scope of its proposed sampling program. The geotechnical program was executed in accordance with the requirements of the National Assessment Guidelines for Dredging 2009 (NAGD, 2009) and will inform the application for a dredging permit. A sediment sampling program has been undertaken as part of this geotechnical program. The aim of the sediment sampling program was to inform sediment characterisation studies carried out for the SREIS. Detailed information on the results of this analysis is provided in SREIS Chapter 12, Sediment Characterisation.
143	The EIS does not include how achievement of marine water quality objectives will be monitored, audited and managed to address impacts identified in the EIS including erosion, acid drainage, dredging, discharges of effluent and brine etc. for all project stages. Provide information addressing all relevant biological, physical, chemical indicators from water quality guidelines (QWAG and ANZECC/ARMCANZ) and also state what actions will be taken if objectives are not met.	LNG S018	**EIS** Chapter 16, Section 16.7. **SREIS** Chapter 13.	As discussed in the EIS, Chapter 16, Marine Water Quality and Sediment, Section 16.7, the dredge management plan will detail inspection and monitoring activities including those to determine compliance with water quality criteria. Measures to manage potential marine water quality impacts are presented in the EIS and were reviewed as part of the studies completed for the SREIS. The commitments are included in SREIS Chapter 13, Marine Water Quality, within Table 13.5. These commitments include measures to monitor water quality as part of dredging operations and to establish appropriate actions in the event that performance criteria are exceeded. Specific additional measures and actions to address non-compliance with project water quality criteria will be developed and approved by the appropriate governing authority prior to any project activity that may affect water quality commencing.

Table 3.13 Issues register – Chapter 16: Marine water quality and sediment (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
231, 232	Examine further the potential release of dissolved aluminium particles at the proposed Launch Site 1 (Calliope River). Sediments containing particulate aluminium and other metals also bonding to pyrites and sulphides will be carried on silt and clay particles then fall and smother vast areas of the river as the tide floods then eases at the top of the tide. If there are freshwater influxes at any of these times, the pyrites will be more easily oxidised than would occur in marine only areas because the calcium buffering is lost. It will oxidise once exposed to dissolved oxygen in the water, and release the aluminium particles into a dissolved form. Arrow must be made aware and take caution that any immune suppression the fish are currently undergoing will easily be heightened to the point of more disease manifesting. PASS muds should be tested to determine what happens on a micro scale across the gills of a fish between marine and freshwater environments. pH buffering is lost in fresh water so acids can be easier released and water testing does not reveal what a fishes gill has been exposed to for a prolonged period.	LNG S020	**SREIS** Chapter 15, Section 15.6.2	ANZECC/ARMCANZ (2000) states the bioavailability and toxicity of aluminium is generally greatest at low pH (e.g., pH<5.5) and high pH (e.g., pH>9). These pH values are not present in the Calliope River. Further, the Eleventh Update (DEHP, 2012) on the Water Quality of Port Curtis and Tributaries including Data Collected in the Week of 1 August 2012 states: "There has been public concern regarding the increase of turbidity levels in Gladstone waterways due to dredging-related activities and its potential to elevate metal concentrations, particularly aluminium. Analyses for the period between September 2011 and August 2012 show no statistically significant relationship between turbidity levels and dissolved aluminium concentrations. This means that there is no evidence to support the suggestion that dredging increases dissolved metal concentrations." The key indirect impact on marine fauna relates to sedimentation and turbidity plumes from dredging works, which can impact on water quality and cause smothering of food sources and habitat. These impacts were reassessed following changes to dredging activities and the design of marine infrastructure and are discussed in SREIS Chapter 15, Marine Ecology, Section 15.6.
439	The mixing zone under the ANZECC guidelines should be duly noted for the size of the mixing zone area that can be used.	LNG S020	**SREIS** Chapter 13, Section 31.1.	The ANZECC/ARMCANZ (2000) water quality mixing zone criteria are discussed in SREIS Chapter 13 Marine Water Quality, Section 13.1. Key discharges from the site have been re-modelled as part of the supplementary Report to the EIS. A standardised mixing zone of 10m was assumed for assessment and comparison of modelled discharges.

Table 3.14 Issues register – Chapter 17: Terrestrial ecology

Issue No.	Issue	Submission No.	Response Reference	Comments
160	The EIS does not fully address nature conservation requirements. Recent and comprehensive freshwater aquatic and terrestrial surveys will be required. The EIS should describe how the project will address provisions of the Nature Conservation Act around clearing of plants, offsets, disturbance to breeding places and protected wildlife. The proponent should act in accordance with the management principles outlined in Section 73 of the Nature Conservation Act.	LNG S018	**EIS** Chapter 17, Section 17.1.1. Appendix 9. Appendix 11. **SREIS** Chapter 18. Attachment 5. Appendix 11.	A detailed response is provided in Section 4.5 of Chapter 4, Part B of the SREIS.
161	Remnant vegetation is located in the project area and may be subject to provisions under the Vegetation Management Act 1999. For areas not subject to an exemption, an operational works permit will be required. The proponent should provide an assessment statement that clarifies how the Vegetation Management Act 1999 applies to the project, including where appropriate reasons for exemptions.	LNG S018	**EIS** Chapter 17, Section 17.1.1 **SREIS** Attachment 1.	The application of the Vegetation Management Act 1999 with regard to native vegetation was set out in the Arrow LNG Plant EIS. Activities under the Petroleum and Gas (Production and Safety) Act 2004 (Qld) are exempt from the requirement to obtain approval to clear native vegetation under the Vegetation Management Act and the Vegetation Management Queensland Regrowth Vegetation Code 2011. The LNG Plant and associated infrastructure has been designed to minimise the impacts on native vegetation where possible, and mitigation measures to achieve this were presented in EIS Chapter 17, Terrestrial Ecology, Section 17.1.1. The construction and operation of the LNG plant and associated infrastructure will be executed under the applicable approvals such as PFL and PPL as discussed in SREIS, Attachment 1, Legislation Update.
163	The EIS does not adequately address unavoidable impacts to State Significant Biodiversity Values by proposing offsets according to the Queensland Biodiversity Offset Policy. The policy requires that an offset strategy is delivered as part of the application documents or an approved Environmental Management Plan (refer to submission for detailed offset strategy requirements).	LNG S018	**SREIS** Attachment 6.	A detailed response is provided in Section 4.5 of Chapter 4, Part B of the SREIS.

Table 3.14 Issues register – Chapter 17: Terrestrial ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
176	Both the EIS (Chapter 14, Tables 14.4 and 14.6) and the EMP do not identify groundwater dependent ecosystems. Identify and assess the potential impact of the project on groundwater dependent ecosystems. The statement there are none present needs to be backed with evidence.	LNG S018	**EIS** Appendix 7, Section 4.6. Appendix 11, Section 5.2.9. **SREIS** Chapter 18, Section 18.6.1. Appendix 11, Chapter 5, Section 5.6.	Potential impacts of the project on groundwater dependent ecosystems are discussed in EIS in Appendix 7, Groundwater Impact Assessment, Chapter 4, Section 4.6; and Appendix 11, Freshwater Ecology and Water Quality Impact Assessment, Chapter 5, Section 5.2.9. The EIS concluded that there may be groundwater dependent ecosystems present, but that the project was unlikely to have any significant impact on groundwater dependent ecosystems. The project does not propose to extract or intentionally drawdown groundwater. Civil engineering works (cut and fill) in the main LNG plant site may intersect shallow perched aquifers. The shallow perched aquifers present at the interface between unconfined sediments overlying shallow bedrock are limited in distribution and connectivity, and would not form part of a regional groundwater system. Any discharge from shallow, unconfined aquifers would occur within intertidal zones, while bedrock unconfined aquifers are likely to discharge to subtidal areas. In addition, the LNG plant is not likely to impact the groundwater recharge of the deeper bedrock aquifer, as recharge is likely to occur on undeveloped areas of higher ground. The magnitude of residual impact on the bedrock unconfined aquifer that would potentially support groundwater dependent ecosystems is very low. Further work has been completed for the SREIS on groundwater dependent ecosystems to validate this conclusion. Additional information is provided in SREIS, in Chapter 18, Terrestrial Ecology (Section 18.6.1), and Appendix 11, Terrestrial Ecology technical study (Section 5.6).

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology

Issue No.	Issue	Submission No.	Response Reference	Comments
37, 221	There is no indication that Arrow will test for underwater noise that may harm fish during pile driving activities. The noise of test drilling undertaken in the harbour to date is thought to have an impact on the abundance of fish in the area.	LNG S010 LNG S020	**EIS** Chapter 19, Section 19.2. **SREIS** Chapter 15, Section 15.6.2 Appendix 8.	A detailed response is provided in Section 4.6 of Chapter 4, Part B of the SREIS.
49	Ongoing dredge works in the Port of Gladstone have been a cause of concern to commercial fishermen. Ongoing dredge works will exacerbate this situation. There is no discussion or guidance in the EIS (Section 5) of short-term impacts of capital dredging, or ongoing impacts of maintenance dredging.	LNG S012	**EIS** Chapter 8, Sections 8.4 and 8.5. Chapter 16. Chapter 19. **SREIS** Chapter 6. Chapter 13. Chapter 15. Chapter 17.	The marine dredging requirements specific to the Arrow LNG Plant are discussed in EIS Chapter 8, Project Description: Dredging. Information concerning capital dredging locations is provided in Section 8.4, and maintenance dredging is provided in 8.5 within Chapter 8. Updated information on capital and maintenance dredging requirements for the project as well as dredging methods and disposal locations and management of dredge spoil is provided in SREIS Chapter 6, Project Description: Dredging. Impacts of dredging on environmental values are discussed throughout appropriate sections of the EIS and Part A of the SREIS. Specific impacts of dredging on marine ecology are discussed in EIS Chapter 19, Marine and Estuarine Ecology; and in the SREIS in Chapters 15 (Marine Ecology) and 17 (Estuarine Ecology (Calliope River)). Impacts on water quality and sediment as a result of dredging activity for the project are discussed in the EIS in Chapter 16, Marine Water Quality and Sediment, and in SREIS Chapter 13, Marine Water Quality.
52	The total amount of plants that may be removed, destroyed or damaged under a possible operational works permit under the Fisheries Act 1994 (Qld) is not provided. The impact on regional marine species is not addressed.	LNG S012	**EIS** Chapter 19, Section 19.4.1. **SREIS** Chapter 15, Section 15.5.1.	The maximum direct loss of habitat for each marine and estuarine habitat type is discussed in EIS Chapter 19, Marine and Estuarine Ecology, Section 19.4.1. The significance of direct and indirect impacts on marine habitats from clearing and dredging is provided in Table 19.6 within the same section. This information has been updated in light of revised dredging extents, marine infrastructure locations, and new calculations for maximum direct loss of marine habitats are provided in SREIS, Chapter 15, Marine Ecology, Section 15.5.1.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
65	Fully assess the direct and cumulative impacts of dredging the mouth of the Calliope River (including acid sulfate soils, spoil placement and maintenance and impacts to flora and fauna).	LNG S014	**EIS** Chapter 15. Chapter 16. Chapter 19. **SREIS** Chapter 6, sections 6.1 and 6.3. Chapter 12. Chapter 15. Chapter 17. Appendix 8. Appendix 10.	A detailed response is provided in Section 4.6 of Chapter 4, Part B of the SREIS.
66	The proponent has failed to detail conservation actions, strategies or mitigation measures to protect rare and vulnerable marine species including dolphins, dugong and turtles. Ensure the dredge management plan identifies mitigation measures to prevent trapping, mortality and other impacts upon significant species.	LNG S014	**EIS** Chapter 19, sections 19.3.3, 19.4.2 and 19.5.2. **SREIS** Chapter 15. Chapter 16.	The existing environment and environmental values of marine fauna are discussed in EIS Chapter 19, Marine and Estuarine Ecology, Section 19.3.3. Potential impacts on marine fauna are discussed in Section 19.4.2, and measures to avoid, mitigate and manage potential impacts on marine fauna are discussed in Section 19.5.2. Updated information on the potential impacts to marine fauna from project activities are provided in SREIS, Chapter 15, Marine Ecology. Information on the potential impacts of lighting on marine turtles is provided in SREIS Chapter 16, Turtles and Lighting. Both chapters contain additional management measures to address the impacts identified. The dredge management plan will be developed and approved prior to dredging activities commencing. The plan will include clear procedures for managing potential impacts to marine fauna for the project incorporating the commitments set out in the EIS and SREIS.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
137	No risk assessment has been performed into the likely rate of impingement and entrainment of marine biota at the reverse osmosis seawater intake structure, and what devices or strategies will be adopted to mitigate these impacts. A risk assessment should be provided and also include potential issues regarding chemical shock dosing and impingement.	LNG S018	**SREIS** Chapter 4, Section 4.9	A detailed response is provided in Section 4.6 of Chapter 4, Part B of the SREIS.
145, 147	The Curtis Island LNG construction fleets have significantly impacted upon the Port Curtis turtle and dugong population by boat strike and disturbance. The EIS does not include an assessment of the use of the estuary (spatially and temporally) by marine species and consequently the risk to these species from the Calliope River launch site. The launch site should be reconsidered with regard to the significance of the river system; a marine mega-fauna study should be undertaken; and cumulative impacts of vessel strike on the turtle and dugong population should be reassessed. Also review mitigation measures including discerning between measures to address boat strike and propeller strike.	LNG S018	**SREIS** Chapter 15, sections 15.5.3 and 15.6. Appendix 8, Section 5.2.1	The spatial and temporal use of the Port Curtis and Calliope River estuary by marine mega fauna has been reviewed using records of opportunistic and targeted observations. Further information on the spatial and temporal use of Port Curtis and the Calliope River by Marine Megafauna is provided in SREIS Chapter 15, Marine Ecology, Section 15.5.3, and Appendix 8, Marine Ecology Technical Study, Chapter 5, Section 5.2.1. Additional mitigations measures have been proposed to manage potential impacts of project activities on marine fauna. These measures are provided in SREIS Chapter 15, Section 15.6, including measures to address boat strike. Arrow Energy is committed to installing (where feasible) propeller guards (or equivalent) on high-speed vessels to reduce the impact of injury in the event of boat strike (Commitment 19.05).
146	EIS Table 19.10 makes no mention of adopting motion sensors to activate lighting when required to reduce impacts on marine turtles. Motion sensors are recommended for lighting where feasible.	LNG S018	**SREIS** Attachment 7. Appendix 9.	Measures to reduce the light and glow emitted from the LNG plant, including the use of motion-activated switches, will be considered during the detailed design of the LNG plant. This approach was recommended by experts Pendoley Environmental Ltd Pty in their assessment of the potential impacts of LNG plant lighting on marine turtles (SREIS Appendix 9, Marine Ecology (Turtles) Technical Study) and has been captured in a new commitment as set out in SREIS Attachment 7, Commitments Update.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
148	The establishment of a green field site at the tunnel entrance on the mainland would exacerbate existing losses of saltpan habitat from Fishermans Landing and Wiggins Island projects, and further decline intertidal wetland and marine ecosystem productivity in Port Curtis. Explain why Fishermans Landing was not considered as a possible location for the tunnel entrance (the existing infrastructure corridor exists to this area).	LNG S018	**EIS** Chapter 5.	The reasons for selection of the various base and alternative cases for Arrow LNG Plant infrastructure sites were discussed in EIS Chapter 5, Assessment of Alternatives. The selection process for the tunnel launch site was extensive and informed by a number of constraints. Fishermans Landing was considered and discounted as a viable option due to congestion at the site, proximity to hazardous materials (ammonia pipeline and storage) and site access. The mainland tunnel launch site was selected to avoid essential habitat for koala and coastal sheath-tail bat along Boat Creek and the proposed Yarwun Coal Terminal.
179	Seagrass communities in the coastal areas of the Burnett River have been shown to have a dependence on submarine groundwater discharge. The EIS has identified that the likely location of lowered water tables is down gradient of the LNG Plant, which is where these communities may occur. Provide comment on how seagrass will be protected during construction of the LNG plant and how these impacts will be managed.	LNG S018	–	The project does not propose to extract or intentionally drawdown groundwater. Civil engineering works (cut and fill) in the main LNG plant site may intersect shallow perched aquifers. The shallow perched aquifers present at the interface between unconfined sediments overlying shallow bedrock are limited in distribution and connectivity, and would not form part of a regional groundwater system. Based on the observed geology and topography of the site, any discharge from shallow, perched aquifers would be likely to occur within intertidal zones, while bedrock unconfined aquifers are likely to discharge to subtidal areas. The LNG plant is not likely to impact the groundwater recharge of the deeper bedrock aquifer, as recharge is likely to occur on undeveloped areas of higher ground. The magnitude of residual impact on the bedrock unconfined aquifer that would be likely to discharge in the area of the seagrass beds is very low. The catchment and drainage system most affected by the proposed development discharges to the western side of Boatshed Point over 1 km from the nearest seagrass beds which are adjacent to Garden Island.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
180	The EIS states that specific monitoring or inspection of aquatic ecosystems is not proposed in low-risk areas (Appendix 11, Section 9, page 91). Some monitoring is still required in low risk areas. Propose an appropriate monitoring program, e.g., site observations and inspections at an appropriate interval.	LNG S018	–	The focus of monitoring should be on environmental values in the study area that are subject to a higher risk of adverse impacts. The need to monitor lower risk areas will be taken into account when detailed monitoring programs are developed (and included in the statutory EM Plan that will be submitted at the time of an application for environmental authority).
211	Arrow's claim that the seagrass beds located 800m to the east of Boatshed Point will not be indirectly impacted is an underestimate. Sediment is likely to fall on the corals and seagrass beds. Furthermore, the beds are deep, filtered from light, and have been affected by past flooding. The project may further slow down their revival period. Seagrass beds in this area trap sediments and use nutrients, filtering waters entering and leaving the harbour into the GBRMP. The harbour waters are already under a major health crisis arising from cumulative impacts of projects, and this is likely to continue into the early stages of this development. Seagrass sampling within 5 km of the area and coral sampling near to the sites should occur before the project commences.	LNG S020 LNG S031	**EIS** Chapter 15. Chapter 16. Appendix 8. Appendix 12. **SREIS** Chapter 15, Section 15.6.1.	A detailed response is provided in Section 4.6 of Chapter 4, Part B of the SREIS.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
212	24/7 dredging should be reduced. The WBDDP originally proposed to leave sea grasses to recover during winter by restricting dredging. There have been numerous environmental breaches and many pulse events after spring tides linked to past dredging. The EIS should contain the full scientific analysis of these events, including nephelometric turbidity units (NTUs), explanation of the decision tree in the ANZECC guidelines and definition of proper trigger values.	LNG S020	**EIS** Chapter 19 **SREIS** Chapter 15.	The modelling carried out for the EIS assumed 24 hour dredging as the worst case scenario. Dredging activities are more likely to be concentrated in daylight hours and the significance of impacts as assessed in the EIS and reviewed in the studies carried out for the SREIS are therefore likely to be conservative (EIS Chapter 19, Marine and Estuarine Ecology, and SREIS Chapter 15, Marine Ecology). When developing the dredge management plan, Arrow Energy will consider the experience of other LNG proponents and Gladstone Ports Corporation in carrying out their dredging projects. The plan, as stated in the EIS, will include applicable trigger criteria and action plans to deal with any exceedences and potential impacts at sensitive areas, such as seagrass. The plan will be developed in consultation with relevant government agencies.
213	There is a misrepresentation of the water and ecological values present in the area as well as the sensitivity of the environmental values present (see EIS Table 16.43). Arrow should not reduce the sensitivity of highly sensitive values. Statements should be changed which will result in changes to EIS Table 16.7 to rate the risks posed by the project.	LNG S020	**EIS** Chapter 19, Section 19.2.2.	The sensitivity of marine and estuarine ecology environmental values in Port Curtis was assigned taking into account well established criteria by marine ecology specialists from Coffey Environments. These criteria included intactness, uniqueness or rarity, resilience to change and replacement potential, in addition to conservation status under the international, Commonwealth and state governments (EIS Chapter 19, Marine and Estuarine Ecology, Section 19.2.2). The sensitivity of each value was defined using these criteria and information obtained from desk studies and field investigations. The sensitivities remain as assessed in the EIS.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
214	Turtles are currently disadvantaged, not in good health, and continually found dead in the area. Pathology report (ref Landos) has shown turtles to have parasite loads as well as internal organ problems, and are therefore more vulnerable to boat strike than what has been presented in EIS (ref Turtle Recovery Plans). This is a cumulative impact and this project will add impacts to organisms that are under stress already. ANZECC guidelines are unlikely to protect these species because they are already immune suppressed.	LNG S020	**EIS** Chapter 19, sections 19.4.2 and 19.5.2. **SREIS** Chapter 15, sections 15.6.2 and 15.9.	Potential direct and cumulative impacts from the construction and operation of the project, including mortality or injury to marine fauna due to boat strike, are discussed in EIS Chapter 19, Marine and Estuarine Ecology, Section 19.4.2; and reassessed in SREIS Chapter 15, Marine Ecology, Section 15.6.2. DEHP was consulted on turtle mortality trends in the Port Curtis region. The annual database of strandings which includes mortality was used in undertaking the assessment. Measures to avoid, mitigate and manage potential impacts to marine fauna such as boat strike are discussed in the EIS in Chapter 19, Section 19.5.2, and in SREIS Chapter 15, Section 15.9. Arrow Energy will install (where feasible) propeller guards (or equivalent) on high-speed vessels to reduce the impact of injury in the event of boat strike (Commitment 19.05). Issues associated with the general health of marine turtles can be attributed to a wide range of environmental and other factors. Arrow Energy will continue to liaise with relevant agencies and other project proponents in managing cumulative impacts in the Gladstone area.
215	Revise fish catch data to include recent lower and diseased unsalable catch rates. Indicate the number of turtle strandings and deaths including dugongs and fish kills within and outside the study area (due to boat strike, pathogens, increased plastics, etc.).	LNG S020	**EIS** Appendix 11, Section 5.4.5. **SREIS** Appendix 8, Section 5.2.1	Fish catch data presented in EIS Appendix 11, Marine and Estuarine Ecology Impact Assessment, within Figure 10 in Section 5.4.5 includes both the quantity and the gross value of fish catches from 1988 to 2010. These figures take into account unsaleable catch rates over this period and provide a long term record of fish catch that shows considerable variability. The most up to date available data on catch rates was obtained from the Queensland Department of Agriculture, Fisheries and Forestry (previously DEEDI). Further studies carried out for the SREIS reviewed existing data on marine fauna sightings and strandings in the Port Curtis area, including potential causes of death (SREIS Appendix 8, Supplementary Marine Ecology Technical Study, Chapter 5, Section 5.2.1). This data shows a reduction in turtle and dugong strandings since 2011.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
216	There have been recent reports that plastics are being found in large volumes around Facing Island. Waste is thought to originate from shipping. Efforts should be made to reduce plastics dumped in the area.	LNG S020	**EIS** Chapter 16. Chapter 19. Chapter 31, Section 31.8.	Potential marine pollution impacts are identified and assessed in EIS Chapter 16, Marine Water Quality and Sediment, EIS Chapter 19, Marine and Estuarine Ecology and EIS Chapter 31, Waste Management, which included impacts from shipping waste. Arrow Energy has made a number of commitments to reduce the likelihood of solid and liquid wastes polluting marine waters including a requirement that all vessels comply with MARPOL. These commitments are discussed in EIS Chapter 31, Section 31.8.
226	The Environmental Protection (Sea Dumping) Act is supposed to stop unsuitable spoil being dumped in marine waters. Project offshore dumping will disperse spoil on currents and tides throughout marine waters which are part of GBRMP.	LNG S020	**SREIS** Chapter 6.	All of the proposed disposal sites are approved sites and all disposal activities will be managed in accordance with those approvals. One of the disposal sites identified in the EIS and SREIS (SREIS Chapter 6, Project Description Dredging) is the approved East Banks Sea Disposal site. Arrow Energy has undertaken a sediment characterisation assessment with results indicating material is suitable for offshore disposal. These results will be used to inform the development of the dredge management plan which will specify how disposal activities will be carried out. Appropriate permits will be obtained prior to dredging and disposal activities commencing.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
283	No video recording and diving was performed for the EIS during field studies. Explain why no significant impact on syngnathid fish is expected.	LNG S024	**EIS** Appendix 12, Section 5.4.7.	As discussed in EIS Appendix 12, Marine and Estuarine Ecology Impact Assessment, Chapter 5, Section 5.4.7; Seahorses and pipefish (syngnathid fishes) occupy a diverse range of habitats including seagrass, tidepools and sheltered inshore areas (Heck, 1980; Gomon et al., 1994). There is limited information about the specific habitats of the individual species. With such variability in habitat utilisation and distribution, and unknown population estimates, limited specific management plans have been implemented apart from protection of selected reef and seagrass habitats. Due to lack of water clarity, it is unlikely that video recording or diving would provide confirmation of the presence or absence of syngnathid fish species. As such, the conservative approach is to assume the presence of these species in areas where associated habitat (i.e., seagrass beds and/or reef) is present. In the EIS, the sensitivity of pipefishes and seahorses is assessed as medium due to their reliance on these threatened habitats. No seagrass beds are predicted to be affected by the project (assessed minor significance of impact on seagrass), and only 0.14 ha of reef and rocky substrate is predicted to be impacted by the project (assessed as negligible significance of impact on reek/rocky substrate). The SREIS Appendix 8, Technical Study of Marine Ecology, Section 6.2, (Table 12) results indicate that there is a minor significance of impact to fish (which include syngnathid fish) and shellfish due to turbidity plumes from dredging, and from underwater noise. The SREIS also found negligible significance of impact from habitat loss.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
313	All dredging not covered under the Western Basin project must take into account the size of sediment plumes and their effect on marine plants. The disposal of dredge spoil in spoil grounds must also be considered.	LNG S025	**EIS** Chapter 15. Chapter 16. Chapter 19. Appendix 8. Appendix 12. **SREIS** Chapter 6. Chapter 15, sections 15.5 and 15.6	A detailed response is provided in Section 4.6 of Chapter 4, Part B of the SREIS.
318	Offsets are to be considered for marine plants including cumulative impacts and possible permissible change increases.	LNG S025	**SREIS** Attachment 6.	The project has been designed with a preference to avoid, minimise and then (with least preference) mitigate impacts to an environmental value. By adopting this hierarchy to minimise impacts, Arrow Energy aims to reduce the necessity for offsets to as low as possible. Offsets to address impacts to marine habitats, including for cumulative impacts are discussed in the draft offset strategy for the project (SREIS Attachment 6, Draft Environmental Offset Strategic Management Plan).
320	Confirm whether artificial structures (e.g., LNG jetties) are being considered as part of the offsets package for marine plants. Research has shown benefits to fisheries productivity. Further fish friendly enhancements of structures could be developed.	LNG S025	**SREIS** Attachment 6.	The draft offsets strategy for the project is included in SREIS Attachment 6, Draft Environmental Offset Strategic Management Plan. The strategy will guide the development of a site-specific offsets plan to be prepared with project approvals prior to construction. Options being considered for marine habitat offsets are discussed in the strategy.
322	An offset strategy for fish habitat must be agreed on prior to construction. The optionality of the project will significantly affect offset considerations.	LNG S025	**SREIS** Attachment 6.	The draft offsets strategy for the project is included in SREIS Attachment 6, Draft Environmental Offset Strategic Management Plan. The strategy will guide the development of a site-specific offsets plan to be prepared with project approvals prior to construction. Marine habitat offsets are discussed in the strategy.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
323, 324, 325, 326, 327	Marine pest management plans and associated monitoring measures to prevent the introduction of exotic marine pests should be developed in accordance with applicable guidelines (e.g., National Biofouling Management Guidance for Non-Trading Vessels, ANZECC Code of Practice and Draft Antifouling and in-water cleaning guidelines) in consultation with relevant government departments. Plans should include measurable outcomes.	LNG S025	**EIS** Appendix 12, Section 7.4.	A detailed response is provided in Section 4.6 of Chapter 4, Part B of the SREIS.
343	Chapters 13 and 18 (and potentially others) should identify State Planning Policy 4/11, Protecting Wetlands of High Ecological Significance in GBR Catchments. Policy must be used and referenced when determining project impacts to freshwater and marine ecosystems on the mainland, Curtis Island and Port Curtis.	LNG S026	**EIS** Chapter 30, Section 30.1.2.	A number of state planning policies established under the Sustainable Planning Act provide guidance to local authorities, Queensland Government agencies and the Planning and Environment Court when making planning decisions and carrying out planning functions. This includes SPP 4/11: Protecting Wetlands of High Ecological Significance in the Great Barrier Reef Catchments. This policy was recognised in the EIS as being relevant to land use and planning within the study area, and was considered along with other relevant planning and statutory guidelines in EIS Chapter 30, Land Use and Planning, Section 30.1.2.
345	Table 32.2 provides misleading and false information that there is no fish or intertidal habitat impacted by Arrow LNG, other LNG facilities or WBDDP. LNG plant dredging would be disturbing fish or intertidal habitat. Proponent to provide definition of 'fish and intertidal habitat' used for the table.	LNG S026	**EIS** Chapter 19. Chapter 32. Appendix 12, Chapter 9.	Table 32.2 within EIS Chapter 32, Cumulative Impacts, is derived from Table 18 within EIS Appendix 12, Marine and Estuarine Ecology Impact Assessment technical study (Chapter 9). Footnotes to that table explain that 'fish and intertidal habitat' is the term used in other proponent's project documents (not the Arrow LNG Plant EIS) and was not defined. The areas provided may contain mangroves, saltmarsh and seagrass. Areas provided for the Arrow LNG Plant in the table are specific for separate environmental values as defined in the technical study EIS Appendix 12, Marine and Estuarine Ecology Impact Assessment, and EIS Chapter 19 Marine and Estuarine Ecology provide an accurate representation of project contributions to cumulative impacts.

Table 3.15 Issues register – Chapter 19: Marine and estuarine ecology (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
346	Section 32.3.5 provides a poor qualitative assessment of the cumulative lighting impacts on marine turtles. Impacts have been identified as low with no justification or scientific explanation of assessment. Assessment should identify and list the known impacts from the EIS and operational knowledge of the three LNG facilities. Provide detailed assessment of the cumulative lighting impacts on marine turtles including appropriate mitigation measures.	LNG S026	**SREIS** Chapter 16, Section 16.4.2. Appendix 9.	A technical study was undertaken for the SREIS by turtle and lighting specialists Pendoley Environmental Pty Ltd to further investigate the impacts of LNG plant lighting (and flaring) on the behaviour of marine turtles and to validate the mitigation measure proposed in the EIS. This study is provided in the SREIS as Appendix 9, Marine Ecology (Turtles) Technical Study, and is summarised in SREIS Chapter 16, Turtles and Lighting. The study establishes the existing lighting environment in the Gladstone area and the areas of the horizon likely to be impacted by sky glow from the LNG plant. The lighting glow (level/brightness) from the plant is unlikely to be distinguishable from existing glow levels. The area the glow covers may increase. Ship Hill on Curtis Island is likely to provide some natural shielding of the light glow from the other three LNG plants, as it is located between the LNG plants and the nesting beaches on Curtis Island (Connor Bluff and Southend) and at North Beach (SREIS Chapter 16, Section 16.4.2).

Table 3.16 Issues register – Chapter 20: Greenhouse gas

Issue No.	Issue	Submission No.	Response Reference	Comments
2	The EIS considers limited Scope 2 emissions. Assessment of Scope 2 emissions (associated with liquefaction) and Scope 3 emissions (end-use combustion) is required to ensure the purposes of the Sustainable Planning Act 2009 are not compromised by approval of this project in isolation from other Australian fossil fuel export projects.	LNG S001	**EIS** Chapter 20, Section 20.4. **SREIS** Chapter 10, Section 10.5.	The EIS assesses the potential impacts of scope 1, 2 and 3 emissions as a result of project construction and operational activities within Chapter 20, Greenhouse Gas, Section 20.4. SREIS Chapter 10, Greenhouse Gas, Section 10.5 provides updated study findings for scope 1, 2 and 3 emissions.
3, 17	LNG production and end use is unlikely to result in lower greenhouse gas emissions/impacts than thermal coal production and export.	LNG S001 LNG S003	–	Noted.
391	The quantum and impact of methane (CH_4) is not identified nor the greenhouse gas potential which is understood to be 25 x CO2 over 100 years or 75 x CO2 over 20 years. Measures - the percentage of Queensland, Australian & global emissions is considered to be a poor measure and is not meaningful. It is suggested that the focus should be on the global warming impact from the consolidated increased emissions (both CO2 and CH4). The proponent is expected to provide an updated commentary on these matters and set out how these impacts would be addressed by the project.	LNG S030	**EIS** Chapter 20, Section 20.4. Appendix 13, Chapter 3. **SREIS** Chapter 10, Section 10.4	As discussed in EIS Chapter 20, Greenhouse Gas (Section 20.2) methane (CH4) from the project was calculated in the form of carbon dioxide equivalents. Therefore, total carbon dioxide equivalent emissions include methane as well as carbon dioxide (CO2), and nitrous oxide (N2O). The potential impact of carbon dioxide equivalent emissions during both construction and operations is discussed in Section 20.4 of the EIS. EIS Appendix 13, Greenhouse Gas Impact Assessment (Chapter 3) discusses the problematic nature of attributing the potential impacts associated with climate change to a single source of greenhouse gas. The potential impacts associated with greenhouse gas emissions from the Arrow LNG Plant will be in proportion with its contribution to global greenhouse gas emissions. Concentrations of greenhouse gases in the atmosphere are typically expressed in terms of global averages. Greenhouse gas emission estimates calculated in the updated greenhouse gas study completed for the SREIS and summarised in Chapter 10, Greenhouse Gas (Section 10.4) are based on techniques discussed in the most recently published guidance documentation by the Australian Government Department of Climate Change and Energy Efficiency (DCCEE). This document includes technical guidelines for the estimation of greenhouse gas emissions by facilities in Australia.

Table 3.17 Issues register – Chapter 21: Air quality

Issue No.	Issue	Submission No.	Response Reference	Comments
159	The amine solvent used to remove acid gases from the feed gas will be regenerated and acid gases vented to the atmosphere. These emissions are likely to contain sulphur-containing compounds. The nature and extent of the emissions have not been included in the air quality assessment or documented in the waste assessment. These emissions should be described and the impact on air quality assessed.	LNG S018	**EIS** Chapter 21.	The acid gases vented to atmosphere will contain small quantities of sulfur containing compounds relative to the project as a whole. Commitment C21.01 in EIS Chapter 21, Air Quality states: Design the LNG plant to comply with the air quality assessment criteria, which are based upon all relevant air quality standards and objectives. Compliance with these criteria will ensure protection of environmental values within the air quality impact assessment study area and all sensitive receptor areas. Through application of this commitment, impacts from sulfur containing compounds will be minimised by design features of the LNG plant, informed by industry best practice, and may include fume capture technology if considered necessary.

Table 3.18 Issues register – Chapter 22: Noise and vibration

Issue No.	Issue	Submission No.	Response Reference	Comments
153	Chapter 22 and Appendix 16 refer to outdated World Health Organisation (WHO) guidelines and refers to 45 dB(A) as an outdoor noise limit during night-time, which in the latest guidelines is 40 dB(A). The new guideline levels should be referenced.	LNG S018	**SREIS** Chapter 11. Appendix 4.	The WHO 2009 guidelines apply specifically to European conditions and do not include Australia. Nevertheless, Arrow Energy has agreed to apply the reduced night time noise construction criterion of 40 dB(A) referenced in the WHO 2009 guidelines. This change has been reflected in the noise and vibration modelling completed for the SREIS and is shown in Chapter 11, Noise and Vibration, and SREIS Appendix 4, Supplementary Noise and Vibration Impact Assessment.
154	The noise study did not provide enough information to establish whether the findings on noise transfer across a facade is applicable to Queensland buildings. Further data showing that 15 dB(A) attenuation is appropriate should be provided (including reference to the types of buildings used in the tests).	LNG S018	**SREIS** Appendix 4.	A dedicated study has been completed of the attenuation of noise across the facade of various Australian buildings including a 'Queenslander' and Queensland pre-fabricated buildings (SREIS Appendix 4, Supplementary Noise and Vibration Impact Assessment). The assessment supports the application of the World Health Organisation standard attenuation of 15 dB(a) for modelling purposes.
155	Table 8.15 in Appendix 16 does not reference whether the sound is underwater noise or airborne noise. Levels should be given for both underwater and airborne noise.	LNG S018	**EIS** Appendix 16, Chapter 8. **SREIS** Chapter 11.	Noise data presented in the EIS in Table 8.15 of the Noise and Vibration Impact Assessment (Appendix 16 of the EIS) are maximum overall sound power levels (i.e., a measure of the noise generated by a noise source). It is recognised that this noise may propagate from the source through either water or air and measures to mitigate noise in the aquatic environment are included in SREIS Chapter 11, Noise and Vibration.
156	The level of significance assigned to marine fauna from noise from unmitigated pile driving in Table 19.8 is too low at 'moderate' and should be 'high'.	LNG S018	**SREIS** Chapter 15, Section 15.6.2. Appendix 8, Section 5.2.	The significance of impact from pile driving on marine fauna has been reassessed and is reported in SREIS Chapter 15, Marine Ecology (Section 15.6.2) and Appendix 8, Technical Study of Marine Ecology (Section 5.2). Arrow Energy has committed to the deployment of bubble curtains, implementation of soft-start procedures prior to full-power pile driving activities, and to undertaking fauna observations prior to and during pile driving to mitigate the impacts of pile driving on marine fauna (SREIS Chapter 15, Marine Ecology, Section 15.6.2).

Table 3.18 Issues register – Chapter 22: Noise and vibration (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
157	The proponent does not provide an indication of the length of time proposed for the ramping up to full power from minimal power in soft start procedures for piling. Ramp up times should be calculated from marine animal audiograms. The use of air bubble curtains as mitigation should be considered. A noise monitoring program for underwater noise should be proposed.	LNG S018	**SREIS** Chapter 15, Section 15.6.2.	The specific details of soft start ups will be included in procedures to be developed in consultation with the EPC contractor and the equipment operators. Such procedures can't be developed at this stage although the objectives of the soft start up can be specified to the contractor. Arrow Energy has committed to the use of bubble curtains to mitigate the impact of underwater noise (SREIS Chapter 15, Marine Ecology, Section 15.6.2). Overall, measures such as these will mitigate the impact of underwater noise to as low as reasonably practicable, regardless of the background level (SREIS Chapter 15, Marine Ecology, Section 15.6.2). As such, testing of underwater noise is not required for the project.

Table 3.18 Issues register – Chapter 22: Noise and vibration (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
158	A number of clarifications are sought in regard to Appendix B, measured background noise vibration level to EIS Appendix 16, around fluctuations in levels, rainfall corrupting data, and background data not having enough measurements to be considered as being representative of areas to be considered. Requirements also apply to underwater noise.	LNG S018	**EIS** Appendix 16, Section 5.2.1. **SREIS** Chapter 15, Section 15.6.2.	Significant variance in noise levels were recorded during the collection of background noise data for the studies completed for the EIS. A correlation between background noise and wind speed was established as described in EIS Appendix 16, Noise Impact Assessment (Section 5.2.1). To confirm the correlation, noise data collected for background readings was compared graphically to wind speeds from the same period. Bureau of Meteorology Gladstone radar station data confirmed that the average wind speeds observed during the monitoring period are reflective of the long term averages. Further analysis of wind speeds and background noise levels for site ML1 has subsequently been undertaken. The results of the analysis confirm that background noise correlates positively with wind speed. The measured background noise is therefore sufficient to provide a representative Rating Background Level, and the background level is generally higher due to wind generated noise. Monitoring was undertaken for 17 days which exceeds the required minimum of seven days. Rain-affected days were also removed. As the underwater noise environment has been affected by construction works associated with the development of the other LNG plants and other projects in Port Curtis, background noise data collected and publically reported for recent studies has been used to establish background levels for the Arrow LNG Plant. The review of this data determined that the mitigation measures that Arrow Energy will apply to works generating underwater noise (e.g., piling) are effective. Measures such as soft starts and bubble curtains will mitigate the impact of underwater noise to as low as reasonably practicable, regardless of the background level (SREIS Chapter 15, Marine Ecology, Section 15.6.2).

Table 3.18 Issues register – Chapter 22: Noise and vibration (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
266	Arrow Energy has not considered the temporary accommodation camps as a sensitive receptor for noise, vibration and air quality assessments. Arrow Energy should include the temporary accommodation camps and associated facilities as a sensitive receptor associated with noise (in particular low-frequency noise and potential sleep disturbance assessments), vibration and air quality.	LNG S022	–	There are no standard noise criteria for construction camps. Construction camps are temporary in nature and are constructed with transportable buildings and generally wall mounted air conditioners. Measures will be implemented to manage construction and other noise to a level no greater than the noise from typical room air conditioners (around 50 to 55 dB(A)) within these buildings. Measures will be implemented to ensure compliance with Industrial Relations accepted working conditions for accommodated workers. Mitigation measures already proposed to minimise noise impacts at other sensitive receptor locations will have a noise reduction effect at the Curtis Island accommodation camp.

Table 3.19 Issues register – Chapter 23: Landscape and visual

Issue No.	Issue	Submission No.	Response Reference	Comments
29	Deficiencies in Maunsell/AECOM assessment for the Victorian Desalination Project in technical study areas of hazard and risk, greenhouse gas, and social impact assessment raises questions to AECOM's credibility in preparing the landscape and visual assessment (Appendix 17) for the Arrow LNG Plant EIS.	LNG S006	–	Noted.
392	Plates 23.10 and 23.12 demonstrate the visual impact of the Arrow LNG Plant exceeds that of the other LNG projects, due to orientation towards Gladstone city. Greater emphasis should be placed on addressing visual amenity. The Coordinator-General should condition the proponent to: (a) provide further options to reduce visual impact (in light of UNESCO concerns). (b) identify and commit to specific measures to reduce lighting impacts on turtles.	LNG S030	**EIS** Chapter 15, Section 15.5.2. Chapter 23, sections 23.4 and 23.5. **SREIS** Chapter 16, sections 16.5 and 16.6. Appendix 9.	A detailed response is provided in Section 4.7 of Chapter 4, Part B of the SREIS.

Table 3.20 Issues register – Chapter 25: Non-Indigenous cultural heritage

Issue No.	Issue	Submission No.	Response Reference	Comments
170	The EIS proposes development of a heritage management plan prior to construction. This management plan should be completed prior to completion of the EIS. Development of the plan should be informed by the department's 'Guide to preparing Archaeological Management Plans'. Proposed site mitigation activities should be included in the draft EMP and formalised in the proposed Heritage Management Plan. Information on the nature of recording and repository of collected information should be provided.	LNG S018	**EIS** Chapter 25, Section 25.5.	The EIS Chapter 25, Non-Indigenous Cultural Heritage, Section 25.5 provides recommended means of mitigating negative impacts upon non-Indigenous cultural heritage values and enhancing positive impacts. Measures such as the heritage management plan (HMP) are developed subsequent to submission of the EIS through consultation with the Queensland Heritage Council and the Department of Environment and Heritage Protection (formerly Department of Environment and Resource Management) regarding the management of places of historic significance, and also taking into account community interests and concerns. A draft HMP will be prepared and submitted for approval prior to construction commencing. The HMP will be developed with due consideration of the Department's Guide to preparing archaeological management plans. The HMP will also include requirements for accidental discovery and Australian and international best practice standards.
171, 207	The heritage potential of TWAF8 should be investigated as part of the EIS process (no fieldwork was undertaken for the EIS). The significance of the brick beehive cistern at the Birkenhead Outstation (and its context within the outstation) should also be subject to a more detailed investigation to inform the appropriate level of mitigation.	LNG S018	**EIS** Chapter 25, Section 25.5.1. Appendix 19, Section 7.4.	Should the TWAF 8 site be chosen to develop an accommodation facility for the project, Arrow Energy will employ specialists to undertake further studies to confirm the significance of any heritage features at this site. General and site specific management measures to address impacts at this site will be included in the cultural heritage management plan. The HMP will be prepared and submitted for approval prior to construction commencing. The significance of the brick-lined water tank found at the "Birkenhead" outstation site was investigated as part of the Non-Indigenous Cultural Heritage Impact Assessment in EIS Appendix 19, Section 7.4, within Table 7, with the location of the site (ALNG-H2) shown in Figure A1. The site falls directly within the construction footprint for the LNG plant and as such will be irreversibly damaged or destroyed during construction. EIS Chapter 25, Non-Indigenous Cultural Heritage (Section 25.5.1) presents detailed measures to mitigate the impacts that include mapping of the site and detailed recording prior to construction activities.

Table 3.20 Issues register – Chapter 25: Non-Indigenous cultural heritage (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
172	Sites listed in Table 25.1 of the EIS should be managed in accordance with their significance, yet details of the reasoning behind significance is limited. The proponent should provide a reasoned statement for the significance of each places or groups of places. Archaeological investigations should be informed by the department's 'Guidelines for Archaeological Investigations'.	LNG S018	**EIS** Appendix 25, sections 5 and 7.2. Chapter 25, Section 25.6	All sites were assessed for their significance to local heritage or local history interest. Full details on the criteria and method used to assess significance, together with a discussion on each site, are included in EIS Appendix 19, Non-Indigenous Cultural Heritage Impact Assessment (sections 5 and 7.2). As discussed in EIS Chapter 25, Non-Indigenous Cultural Heritage Section 25.6, the known non-Indigenous cultural heritage sites to be impacted by Arrow LNG Plant are not listed as significant on any national, state or local register and are of local heritage significance and heritage interest only. The HMP will be prepared and submitted for approval prior to construction commencing and will be informed by relevant legislative guidelines and Australian and international best practice standards including the 'Guidelines for Archaeological Investigations'. The need for further research to confirm the significance of sites will be reviewed as part of the development of the HMP.

Table 3.21 Issues register – Chapter 26: Social

Issue No.	Issue	Submission No.	Response Reference	Comments
22	Identify management strategies to address the consequences of limited accommodation availability and affordability, the impact for local residents including emergency service personnel at a reasonable cost (i.e., increases in Gladstone population may lead to need for QAS/QFRS to recruit and pay sufficient numbers of paramedics/ fire fighters. These services may face additional costs in supporting staff through the provision of government housing, subsidies and other support measures). Identify project housing commitments.	LNG S004 LNG S031	**EIS** Attachment 7, Section 3.1. **SREIS** Attachment 4, Section 3.1. Attachment 7.	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.
23	Identify the impact of the project on surrounding community health and services infrastructure, should the project result in a significant increase in population.	LNG S004	**EIS** Appendix 20, Section 5.7. Attachment 7, Section 3.6. **SREIS** Attachment 4, Section 3.6.	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.
28	The Terms of Reference for the EIS was finalised prior to the inclusion of the Workforce Management Criteria developed by Skills Queensland and approved by the Coordinator-General. Skills Queensland suggests that the current Workforce Management Plan Criteria template (www.skills.qld.gov.au/significant projects) be completed at FID or prior to construction.	LNG S005	–	Noted.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
30	QPS seeks an acknowledgement from Arrow that the project may impact upon crime in Gladstone. Conditions sought include: consulting QPS in relation to how impacts on crime may be magnified by the project; implementation of strategies to reduce, so far as practicable, impacts of the project on crime, public order and calls for service (including the existing Central Business District Safety Plan); and explore opportunities to extend behavioural conditions beyond the worksite to behaviour within the Gladstone community.	LNG S007 LNG S031	**EIS** Attachment 7, Section 3.6. SREIS Attachment 4, Section 3.6.	Arrow Energy recognises community concern about the potential for the project workforce to generate an increased risk of crime and antisocial behaviour. A community health and safety action plan has been developed as a part of the SIMP to manage these potential impacts (EIS Attachment 7, SIMP and SREIS Attachment 4, SIMP Update, Section 3.6). Arrow Energy will continue to work with the Coordinator-General, Queensland Police Service and other relevant stakeholders who are coordinating responses to these issues.
39	The EIS identifies 130 additional families requiring services in the Gladstone community during construction and operation. Arrow has classed this as a minor impact, however DCCSDS consider the housing and rental in Gladstone highly stressed at the moment.	LNG S011	**EIS** Attachment 7, sections 2.10 and 3.1. Appendix 20, Section 5.12. **SREIS** Attachment 4, sections 2.10 and 3.1.	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
41	SIMP Housing and Accommodation Plan should take into consideration the development of comprehensive baseline indicators and assessment of cumulative impacts; inclusion of assessment strategies for potential source communities including predicted changes to the costs of housing and need for social services; and long term use of housing developments (including plans for housing to be used as social and affordable housing or community infrastructure after project completion).	LNG S011 LNG S031	**SREIS** Attachment 4, Section 3.1	Arrow Energy has committed to providing an early works accommodation strategy four months prior to the commencement of construction. The strategy will address the period from commencement of construction to final commissioning of the construction camp on Curtis Island. In addition, a construction workforce accommodation strategy will be developed within 12 months of the EPC contract being awarded. This will be based on current data available on the housing market at the time and will include consultation with the other LNG proponents and the Office of Economic and Statistical Research (OESR) reporting data (SREIS Attachment 4, SIMP Update, Section 3.1). This approach will ensure the proposed management strategies are suitable for managing impacts on housing and accommodation expected at this time. Arrow Energy has also committed to provide $6.5 million towards the development of affordable housing in Gladstone.
42	Further detail/commitment is requested in relation to the Social Investment Plan (i.e., net social investment as a percentage in relation to the likely impacts to the community).	LNG S011 LNG S031	**SREIS** Attachment 4.	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
44	The investment in the development of a good citizen policy and workers' induction process is valuable. Further details are requested to address a range of other social issues noted in similar communities (e.g., potential increase in violence, drinking, drug use). Include strategies to: • Promote participation of workers in local sport, recreation and volunteering opportunities. • Increased consultation with Office for Woman (Department of Communities) and the Centre for Domestic and Family Violence Research, particularly regarding issues of women's safety and violence. • Include baseline study of instances of violence, drinking, drug-use and the establishment of a monitoring regime/strategy in SIMP.	LNG S011 LNG S031	**SREIS** Attachment 4, sections 3.2 and 3.6. **EIS** Appendix 20, Section 4.7.	The community investment and wellbeing action plan in the updated SIMP (SREIS Attachment 4, SIMP Update, Section 3.2) includes a commitment to provide workers with a welcome kit on induction. This will include contact details for relevant organisations and information for workers on participation in recreation and volunteering opportunities in the Gladstone area. A baseline assessment of crime and safety within Gladstone is provided in Section 4.7 of EIS Appendix 20, Social Impact Assessment. A community health and safety action plan has been developed as a part of the SIMP to manage potential issues associated with safety and antisocial behaviour (SREIS Attachment 4, Section 3.6). Arrow Energy will continue to work with the Coordinator-General and other relevant stakeholders who are coordinating responses to these issues. Through the Gladstone Region Community Development Committee or other mechanisms, Arrow Energy will continue to engage with local service providers and community organisations across the Gladstone region. In particular, Arrow Energy will consult specifically with Office for Women and the Centre for Domestic and Family Violence Research to monitor impacts of alcohol, violence and impacts on families.
45	Include further information in the SIMP as to how public engagement strategies will be developed to ensure information is available for those who use alternative community strategies, including people with disabilities and/or for whom English is a second language.	LNG S011	**EIS** Chapter 4, Section 4.5 Attachment 7. **SREIS** Attachment 4.	Arrow Energy acknowledges the importance of using a range of mechanisms and tools to engage with the community. As outlined in EIS Chapter 4 Consultation and Communication, Section 4.5, Arrow Energy's ongoing community and stakeholder engagement program will be supported by a stakeholder engagement plan (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update).

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
46	Arrow should reflect on the Closing the Gap framework as part of the EIS process.	LNG S011	**EIS** Attachment 7, Section 3.3. **SREIS** Attachment 4, Section 3.3.	Arrow Energy acknowledges that the provision of employment opportunities for Indigenous people and businesses is an important mechanism for 'Closing the Gap'. The Indigenous engagement strategy outlined in the SIMP has been updated so that appropriate measures are in place to provide project employment and education opportunities to Indigenous people and communities (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.3).
71, 276	The mitigation action to "Work with state government, the GRC and Indigenous community to identify opportunities to provide assistance to not-for-profit housing providers to support the Indigenous community' is commended. Provide further detail regarding 'Indigenous community representatives' (under identified stakeholders), and specifically nominating an Indigenous housing organisation to which funds would be directed (see SIMP Action Plan: Housing and Accommodation--Affordable Housing, p.47).	LNG S030	**SREIS** Attachment 4, Section 3.1.	Arrow Energy remains committed to working with state government, the GRC and Indigenous community to investigate opportunities to assist not-for-profit housing providers to support the Indigenous community. The SIMP has been updated since the EIS was finalised and is included in SREIS Attachment 4, SIMP Update. The action plans, including for housing and accommodation, are provided in Section 3.1. The SIMP includes a commitment to provide $6.5 million towards Gladstone Affordable Housing (GAH) for the provision of affordable housing options in the Gladstone Region. GAH is committed to providing housing to key target groups including Aboriginal and Torres Strait Islander people. Arrow Energy has also committed to providing $1 million for Emergency Rental Assistance (ERA) to GRC for distribution.
72	Expand the action 'Work with the ULDA to identify opportunities in the study area to bring additional affordable housing to market for existing residents' to include consultation with ULDA, Gladstone Regional Council and Affordable Housing providers.	LNG S016	**SREIS** Attachment 4, Section 3.1.	The SIMP has been updated (SREIS Attachment 4) to include the action to "work with the Queensland Government, GRC and affordable housing providers to identify opportunities in the study area to bring additional affordable housing to market for existing residents." Arrow Energy has also committed to provide $6.5 million towards the development of affordable housing in Gladstone. Arrow Energy has met with and negotiated with Gladstone Affordable Housing (GAH) to provide this funding.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
73	Consider the timing for construction of the workers accommodation camp and how this may impact the local housing market. Evidence in other areas indicates that the demand for the non-resident workforce in the pre-construction period can have detrimental impacts on housing supply.	LNG S016 LNG S031	**EIS** Attachment 7, Section 3.1. Appendix 20, Section 5.4.	The SIA (EIS Appendix 20, Section 5.4) considers the impacts of increased housing demand during construction and operation of the project. Prior to the construction camp becoming operational between 200 and 300 workers are expected to need accommodation on the mainland. Options for accommodating these workers include residential properties (should market conditions allow), third party provided construction camp facilities or other forms of accommodation facilitated by the project. Arrow Energy has committed to developing an early works workforce accommodation strategy to be finalised four months prior to construction commencing which will address how workers will be accommodated during the early works phase (EIS Attachment 7, SIMP, Section 3.1).
74	Any strategy for workers accommodation needs to address housing and accommodation requirements for contract staff employed for the project.	LNG S016	**SREIS** Attachment 4, Section 3.1.	Noted. This information is provided in SREIS Attachment 4, Updated SIMP, Section 3.1.
227, 228, 229	Toxic algae have been found during Western Basin dredging works and this has been causing human health issues. The project has the potential to increase the likelihood of occurrence of waterborne bacteria or toxic cyanobacteria and result in waterway users contracting waterborne bacteria. Update the health impact chapter and Appendix 27 to include risks from toxic bacteria and cyanobacterial outbreaks. Conduct testing for toxic species of bacteria and cyanobacteria for the duration of the project and identify measures to respond to outbreaks such as education, warnings, treatment and compensation.	LNG S025	–	Arrow Energy has a comprehensive Health, Safety and Environmental Management System. Potential health impacts arising from the project, including from waterborne disease will be continually assessed and managed through standard operating procedures. The findings of any relevant government reviews or studies on this issue (that relate to dredging activities) will be considered in the development of the dredge management plan for the project. The plan will include provisions for water quality monitoring.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
270	Arrow Energy has not adequately considered management of alcohol, tobacco and other drugs in accommodation camps. QH recommends that: • Each camp should be design to either be a smoke free environment, or provide for a single smoking area that is located in such a location that it doesn't impact on other residents at the camp. • Arrow Energy develops an alcohol management plan to encourage safe and responsible consumption of alcohol. The common response from companies is to develop a Code of Conduct. This should be one strategy amongst others that include the consideration of an alcohol, tobacco and other drugs workplace policy, and should provide information on potential risks and support lines.	LNG S022 LNG S031	**EIS** Attachment 7, Section 3.6. **SREIS** Attachment 4, Section 3.6.	Policies and codes of conduct relating to public and worker's health and safety will be developed for the project. These policies will be based upon Arrow Energy's existing Code of Conduct and drug and alcohol policy, and will be developed prior to construction commencing. A number of strategies will be developed to manage issues relating to alcohol, tobacco and drug use in accordance with Arrow Energy's comprehensive Health, Safety and Environmental Management System. These include the provision of a counselling service, enforcement of smoking regulations on site and implementing drug, alcohol and contraband policies (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.6).

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
271	The Pest Management Plan forming Appendix 10 of the EIS relating to mosquitoes and biting midges is incorrect. It refers to the Health Act 1996 as legislation authorising local government to implement mosquito control programs to control vector-borne disease. The Public Health Act 2005 gives local government responsibility for particular public health risks. The responsibility for the reduction of the risk lies with the landholder, therefore Arrow Energy is responsible for undertaking treatment to ensure mosquitoes do not present a risk of disease to workers or other persons. Arrow Energy must develop a more comprehensive plan to manage mosquitoes.	LNG S022	–	Arrow Energy acknowledges that it has an important role to play in managing biting insects such as mosquitos. Appropriate management measures will be included in the pest management plan and implemented on project sites (where Arrow Energy is the landowner) to manage any impacts associated with an increase in biting insects and to control vector-borne diseases. The pest management plan included in the EIS as Appendix 10 contains an incorrect reference. The plan refers to the Health Act 1996, when it should refer to the Health Act 2005. This does not detract from the value of the plan.
273, 274	Arrow Energy has indicated that 30-40% of the workforce are planned to be sourced locally, and the remainder will be under a fly-in fly-out model/regime. Clarify how healthcare will be provided for this workforce including details of where services will be provided (mainland and/or Curtis Island), and requirements for onsite health personnel.	LNG S020	**SREIS** Attachment 4, Section 3.6.	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.
275	Arrow Energy has estimated that the peak workforce of 3,713 in Phase 1 and 2,330 in Phase 2 will impact on housing. This impact will exacerbate current housing shortages in the area, which is a significant issue for health personnel, both in terms of access to short and long term housing, but also affordability and ability to attract a health related workforce to the area.	LNG S022 LNG S031	**EIS** Attachment 7, Section 3.1. **SREIS** Attachment 4, Section 3.1.	The Housing and Accommodation Action Plan within the SIMP has been developed to manage project impacts on the housing market and temporary accommodation. The mitigation measures outlined in this action plan will be refined through the development of specific accommodation strategies throughout the project. The SIMP has been updated since the EIS was finalised and is included in SREIS Attachment 4, SIMP Update. Action plans, including housing and accommodation, are discussed in Section 3.1.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
295	The EIS does not adequately address local content. Reference the Queensland Industry Participation Policy Act 2011 (QIPP Act), Local Industry Policy (Oct, 2010) and Local Industry Policy Guidelines (May, 2011) and develop the project Local Industry Participation Plan in accordance with these documents.	LNG S025 LNG S031	**SREIS** Attachment 4, Section 3.5	Actions relating to local content are addressed in the local content action plan in the SIMP Update (SREIS Attachment 4, Section 3.5). Arrow Energy has developed a draft Australian Industry Participation Plan (AIPP), which will be submitted to the Federal Government in December 2012. The plan provides detailed information on the strategies and approaches that will be taken to: • Encourage contractors to source local goods and services where possible. • Encourage businesses to consider Indigenous procurement to maximise Indigenous employment opportunities. • Engage key business bodies regarding appropriate opportunities for local businesses to supply goods and services to the project. The draft AIPP is being developed in consultation with the Federal government and Coordinator-General.
296	Update sources used for residential population and projections with ABS, Cat No. 3218 and OESR Queensland Government Population Projections.	LNG S025	**SREIS** Attachment 4, Section 3.1.	The data used for the social impact assessment and social impact management plan was the most recent data available at the time. Arrow Energy is committed to working with the Coordinator-General to ensure that the development of project plans and strategies are based on currently available data. Arrow Energy will participate in OESR surveys to monitor housing and worker accommodation in Gladstone undertaken for the Gladstone Housing Report (SREIS Attachment 4, SIMP Update, Section 3.1).
299	The baseline socioeconomic profile of the region is well established, and no action is required on this matter.	LNG S025	–	Noted.
300	The workforce profile of the project is based on reasonable and logical assumptions, and no action is required on this matter.	LNG S025	–	Noted.
301	Social impacts covering a variety of topics are addressed and covered comprehensively through the use of an impact rating tool.	LNG S025	–	Noted.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
302	The EIS acknowledges adverse impacts on Gladstone housing and accommodation situation. The timing of mitigation is important and strategies should be implemented prior to there being an adverse impact from the project (e.g., construction of temporary accommodation in advance of main influx of workforce).	LNG S025 LNG S031	**EIS** Attachment 7, Section 3.1. **SREIS** Attachment 4, Section 3.1.	Arrow Energy acknowledges the importance of implementing measures to mitigate potential impacts on housing and accommodation as early as possible. Recognising this, Arrow Energy has committed to developing an early works accommodation strategy to cover the period from construction commencement until final commissioning of the Curtis Island construction camp. Further, specific actions to address this issue are included in EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.1. Target dates for implementation of actions are included in the SIMP. An updated SIMP is provided in Attachment 4 of the SREIS.
303	LNG Community Housing Scheme responds to conditions on LNG industries for seniors, unemployed youth/apprentices and critical workers. Consider gap of students of CQ University and CQ TAFE.	LNG S025	–	Noted.
305	The project should complement the investment of other LNG industries in contributing funds to improve health services.	LNG S025 LNG S031	**SREIS** Attachment 4, Section 3.6.	Arrow Energy is committed to maintaining the health and wellbeing of project personnel. The Community Health and Safety action plan (SREIS Attachment 4, SIMP Update, Section 3.6) includes measures to protect the welfare of the community and project workers. These measures will be refined prior to construction commencing in consultation with Queensland Health and other stakeholders.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
43, 348	Engage with DETE Employment Initiatives to develop programs to assist vulnerable members of the community to be work ready. Provide more detail as to employment strategies in relation to women, youth and individuals with a disability.	LNG S011 LNG S027	**EIS** Attachment 7, sections 3.3 and 3.4. **SREIS** Attachment 4, sections 3.3 and 3.4.	The SIMP (EIS Attachment 7, and SREIS Attachment 4 SIMP Update, sections 3.3 and 3.4) includes strategies to assist vulnerable members of the community in gaining employment on the project. In particular, the workforce and training action plan within the SIMP includes a commitment to consult with DETE to identify strategies to address skills gaps. Possible solutions include training programs that would allow for up-skilling of workers. Arrow Energy is also committed to continuing to provide entry level positions to the business including traineeships, apprenticeships, Indigenous scholarships, vocation employment and graduate roles. The Indigenous Engagement Strategy also includes commitments to identify, in consultation with DETE and other stakeholders, appropriate methods to recruit and retain Indigenous Australians. The plan includes a commitment to work with existing work ready programs and to identify roles on the project for successful participants.
349	References to DEEDI in SIMP should be updated to DETE.	LNG S027	**SREIS** Attachment 4.	Noted. The SIMP has been updated accordingly (SREIS Attachment 4).
354	When lodging the final draft SIMP, include where possible confirmation that mitigation and management strategies have been agreed with relevant agencies and stakeholders. If liaison is still underway, progress should be noted in the relevant action plan.	LNG S029	**SREIS** Attachment 4, Sections 2.9, 3.1 to 3.8	The final draft SIMP will confirm, where possible, where mitigation and management strategies have been agreed with stakeholders or where liaison is currently underway.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
355	Each SIMP action plan needs to provide performance indicators to assist with monitoring, reporting, review and compliance. These are of particular significance in relation to apprenticeships, trainees, indigenous employment and vulnerable groups.	LNG S029	**SREIS** Attachment 4.	Section C of the SIMP Update (SREIS Attachment 4) provides a framework for ongoing monitoring, reporting and review of the action plans. Arrow Energy acknowledges that performance indicators will be critical to monitoring, reporting and reviewing the effectiveness of the mitigation strategies proposed to manage the project's social impacts. These indicators will be identified at the appropriate stage of development for each action plan and included in future updates to the SIMP. Arrow Energy will undertake external reporting during construction and operation through the publication of an annual sustainability report. Arrow Energy will also report on some indicators more regularly through the Gladstone RCCC and on the Arrow Energy website.
356	Include, as appropriate, Arrow or stakeholder-agreed targets for action plans.	LNG S029	**SREIS** Attachment 4.	Targets for each of the action plan objectives will be identified in consultation with relevant stakeholders at the appropriate stage and included in the future updates to the SIMP.
357	Where budgets/ strategies for action plans have been agreed, specify these commitments.	LNG S029	**SREIS** Attachment 4, Sections 3.1 to 3.8	Additional information has been included within the housing and accommodation action plan within the SIMP Update within the SREIS (Attachment 4, Section 3.1) regarding the budget for emergency rental assistance and affordable housing. The final draft SIMP will note where agreements on budgets and funding have been achieved.
358	Consider project alignment with the Major Resource Project Housing Policy.	LNG S029	–	The Major Resource Project Housing Policy was considered in the development of the SIA and draft SIMP. The project was found to be generally consistent with the core principles of the policy. The main area of difference relates to project workforce accommodation, with factors such as the limited availability of accommodation within Gladstone and the nature of some of the positions likely to limit workers ability to relocate to the Gladstone area. During the development of the project accommodation strategies, the existing conditions within the Gladstone housing market will be considered when determining the most suitable approaches for housing. Housing options will be developed to align with the principles of the Major Resource Project Housing Policy where possible.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
359	Expand consultation to include Gladstone Affordable Housing Company.	LNG S029	**SREIS** Attachment 4, Section 3.1.	Arrow Energy has consulted with the Gladstone Affordable Housing Company and agreed to provide $6.5 million in funds to the development of affordable housing options in Gladstone (SREIS Attachment 4 SIMP Update, Section 3.1). Arrow Energy will continue to work with the Gladstone Affordable Housing Company and other LNG proponents on how to best allocate these funds.
360	Provide more details on the range of housing options being considered for the construction and operational workforce (e.g., availability of private dwellings).	LNG S029	**EIS** Attachment 7, Sections 2.3.1 and 3.1. **SREIS** Attachment 4, Section 3.1.	EIS Attachment 7 SIMP, Section 2.3.1 outlines the housing options being considered for the construction and operational workforce. An early works accommodation strategy will be developed four months prior to construction start and a construction workforce accommodation strategy will be developed within 12 months of awarding the EPC contract to further refine these options (EIS, Attachment 7 and SREIS Attachment 4, SIMP Update, Section 3.1). Examples of accommodation options for company facilitated communal living, include: • Medium to high density developments. • Third party construction camps already operational in the Gladstone Region. • Pioneer workers camp on the mainland. • Rental properties where market conditions allow.
361, 405	GRC sees difficulties in implementing a strategy around a rental vacancy rate of 3%. A measure of rental property prices would be a more responsible measure. GRC considers the commitment to some 90 to 130 houses for up to 600 long term mainland based operational staff as significantly below the demand generated for the project.	LNG S029 LNG S030	**EIS** Chapter 26, Section 26.4.2. **SREIS** Attachment 4.	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
362	Arrow's involvement in the Cumulative Impacts Housing Working Group - Data Collection and Monitoring Framework will make clear how data collection on workers/families will be collected and the company's associated commitments.	LNG S029	–	Noted.
363	The statement under SIMP 3.1 Housing and Accommodation Action Plan (Long Term Housing): "Identify preferred approach for facilitation of 380 beds in company facilitated accommodation for construction management single status workers and 225 for operation workers through project accommodation strategy" is unclear. This is included under long term housing but seems to refer to camp accommodation. Please clarify.	LNG S029	**SREIS** Attachment 4, Section 3.1.	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.
364	The additional 215 workers identified in the SIA (tunnel, gas pipeline and dredging workforce) should be accommodated in workers camps.	LNG S029	**EIS** Attachment 7, Section 3.1. **SREIS** Attachment 4, Section 3.1.	Noted. These workers will be considered in both the early works accommodation strategy and the construction workforce accommodation strategy (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.1).
365	Clearly explain all accommodation for all temporary Arrow employees and contractors. All temporary workers/contractors should be accommodated in camps; private housing market should not be considered. Clarify both Arrow (Curtis Island and possibly mainland camp) and commercial camps as to locations, no. of beds, duration of camps and expected dates they will be available after FID.	LNG S029	**EIS** Attachment 7, Sections 2.3.1 and 3.1. **SREIS** Attachment 4, Section 3.1.	EIS Attachment 7, SIMP, Section 2.3.1 outlines the housing options being considered for the construction and operational workforce including Arrow Energy staff and contractors. An early works accommodation strategy will be developed four months prior to the start of construction and a construction workforce accommodation strategy will be developed within 12 months of awarding the EPC contract to refine these options further (EIS Attachment 7, and SREIS Attachment 4, SIMP Update, Section 3.1). The private housing market will be considered as part of this strategy where rental availability is greater than 3%.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
366, 367	Describe the Indigenous community action plan as an 'Indigenous Engagement Strategy' and include training opportunities (as well as employment). Include appropriate cross references to the Workforce Management Pan and Local Industry Participation Plan.	LNG S029	**SREIS** Attachment 4, Section 3.3.	The Indigenous community action plan has been amended to the "Indigenous Engagement strategy" in the updated SIMP (SREIS Attachment 4, Section 3.3). The strategy includes a commitment to identify apprenticeships or traineeships that could be made available to underemployed or unemployed Indigenous people and to link with work ready programs to ensure training is appropriately tailored to the necessary skills. The strategy has been amended to provide cross references to the Workforce Management Plan and Australian Industry Participation Plan (AIPP).
368	In regard to "Develop a policy identifying training pathways for students… Where relevant programs have been initiated by other proponents Arrow Energy will consider coordinating support with these where appropriate". This action needs to say 'support' to demonstrate the level of commitment to school and university based training and employment programs.	LNG S029	**SREIS** Attachment 4, Section 3.4.	Arrow Energy is committed to supporting students and school leavers in gaining employment upon graduation. The workforce and training action plan included in the SIMP Update (SREIS Attachment 4, Section 3.4) has been amended to reflect Arrow Energy's support for the following programs: • Indigenous tertiary scholarships. • Go WEST (Women in Engineering and Science and Technology) – Arrow Energy Aiming for a Brighter Future Program. • Education Queensland Industry Partnership (EQIP) – Gladstone. • Queensland Minerals and Energy Academy (QMEA).
369	Ensure the local industry participation plan is consistent with the Queensland Government's Local Industry Policy and associated guidelines.	LNG S029	**EIS** Attachment 7, Section 3.5. **SREIS** Attachment 4, Section 3.5.	Noted. The local content action plan outlines the key actions relating to local content, which includes the development and implementation of an Australian Industry Participation Plan (AIPP) in consultation with the Federal government and the Coordinator-General (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.5).

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
370	Develop and agree mitigation strategies in terms of working with Queensland Police on service delivery matters (e.g., planning and response, water policing, road safety priorities) and Queensland Health (potential impacts on community and medical health services and incident response) in the community health and safety plan.	LNG S029	**SREIS** Attachment 4, Section 3.6.	Arrow Energy is committed to working with Queensland Police and Queensland Health on managing health and safety impacts associated with the project. This commitment is reflected in the relevant actions in the community health and safety action plan included in the SIMP Update (SREIS Attachment 4, Section 3.6).
371	Community amenity action plan needs to better identify strategies that address specific issues of concern raised around air quality, visual amenity and noise, rather than general approaches to these issues.	LNG S029	**EIS** Attachment 6. **SREIS** Chapter 3, Section 3.7; and Appendix E.	Community concerns about the potential impacts on amenity relating to issues such as air quality, visual amenity and noise will be addressed in accordance with the complaints management system described in the SIMP Update (SREIS Attachment 4, Appendix E). This system will be refined prior to construction commencing. The Regional Community Consultative Committee for Gladstone will serve as a vehicle through which these issues can be raised, actioned and addressed. The Environmental Management Plan (EIS Attachment 6 and SREIS Attachment 3, Strategic EMP) details the management measures to be implemented by Arrow Energy to manage environmental impacts.
372	Cumulative impacts action plan needs to include engagement with Department of Housing, Gladstone Regional Council, Gladstone Affordable Housing and key housing providers. The plan needs to recognise ongoing participation in the Cumulative Impacts Housing Working Group - Data Collection and Monitoring Framework.	LNG S029 LNG S031	**SREIS** Attachment 4, sections 3.1 and 3.8.	Arrow Energy is in discussion with a number of government departments and agencies in respect to the cumulative impacts of the project on housing. This includes discussions with Gladstone Affordable Housing Council on the provision of $6.5 million towards the development of affordable housing in Gladstone and GRC on the provision of $1 million for emergency rental assistance. The housing and accommodation action plan included in the SIMP Update has been amended to include cross references to the cumulative impacts action plan (SREIS Attachment 4, Section 3.1).
373	Review the titles for the Government Departments and update to reflect new arrangements.	LNG S029	**SREIS** Attachment 4.	The SIMP has been updated to reflect the new government departments (SREIS Attachment 4).

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
374	The term 'local' is used but not defined in the EIS. The Coordinator-General should stipulate in conditions that the term 'local' only apply to: Were domiciled in the Gladstone Regional Council area (or within 60 km of Gladstone CBD) for at least six months prior to being engaged for work on the project. Had a residential address in the Gladstone Regional Council area (or within 60 km of the Gladstone CBD) for at least six months prior to being engaged for work on the project.	LNG S030	**EIS** Appendix 20, Section 1.4.	The SIA (EIS Attachment 7, Section 1.4) includes a definition of the term 'local worker'. For the purposes of the SIA, local workers were assumed to include workers residing within the GRC local area prior to the commencement of the construction stage of the project.
375	Reliance has been placed on the 2006 Census statistics. The proponent must utilise the most current statistical data available, particularly more recent estimates from OESR, in all documents to be prepared for approval by various agencies.	LNG S030 LNG S031	–	Information from the 2006 Census was the most recent data available at the time of writing the SIA across the full range of socio-economic indicators. Information from the 2011 Census was not publicly available until June 2012, after the EIS had been finalised in March 2012. Data from the 2006 Census was supplemented with more recent information, including data sourced from Commonwealth and state government agencies, local government, the Real Estate Institute of Queensland (REIQ) and other sources as relevant. More recent data (than 2006) on estimated residential population, population growth, labour force and unemployment, income, crime and property prices were included in the SIA. Future updates of the SIMP will also continue to be informed by the most recent data as it becomes available.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
376	Approvals for other LNG proponents have required proponents to provide 50% of mainland housing for 'workers seeking to settle' (an undefined term). Less housing has been provided, which has contributed to housing stress in Gladstone. The Coordinator-General should condition the proponent: (a) to provide mainland housing for 50% of the project workforce taking up residence (i.e., residing in residential accommodation for six months or more). (b) to provide such housing in a timely manner so that it is available when project demand arises.	LNG S030 LNG S031	**EIS** Attachment 7, Section 3.1. **SREIS** Attachment 4, Section 3.1.	Noted. A housing and accommodation action plan has been developed as a part of the SIMP (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.1). This includes commitments to develop an early works accommodation strategy four months prior to the start of construction, a construction workforce accommodation strategy within 12 months of awarding the EPC contract and an overarching project accommodation strategy within 24 months of completing construction. Housing options will be refined further in these plans (EIS Attachment 7 and SREIS Attachment 4, Section 3.1). The construction workforce accommodation strategy will identify the preferred approach for facilitating up to 90 houses during the construction phase. This will be based on the state of the market to meet this project generated demand and required market interventions to minimise impacts on the community. The operational workforce accommodation strategy will identify the preferred approach for facilitating up to 130 houses (increasing from 90 during construction) during the operation of trains 1 and 2. This will be based on the state of the market to meet this project generated demand and required market interventions to minimise impacts on the community.
377	More should be done to recognize the impact of 'local' employment on local businesses (staff retention, skills loss, wages). The Coordinator-General should condition the SIMP to identify and commit to measures to address: (a) effects of employment of 'locals' and loss of skilled staff at local businesses. (b) heightened expectations of wages and conditions brought about by higher project wages.	LNG S030 LNG S031	**EIS** Attachment 7, Section 3.5. **SREIS** Attachment 4, Section 3.5.	The Local Content Action Plan within the SIMP has been developed to manage impacts on local businesses from competition for staff and to provide strategies to assist them in maximising opportunities to service the project (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.5). Further, Arrow Energy has engaged an Education and Training Coordinator to undertake regular reviews of non-project related labour requirements and current skills sets to ensure that training strategies meet these needs. The Coordinator will work with the Social Investment Team and various state agencies and other skills bodies to conduct assessments of existing community skills to minimise impacts on local businesses.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
378	Council notes that where previous proponents were asked to 'consider' contributions to Gladstone Foundation there was a significant delay in commitments being made by proponents. The Coordinator-General should frame approval conditions to ensure they meet a specific outcome in a defined timeframe.	LNG S030 LNG S031	**EIS** Attachment 7, Section 3.1. **SREIS** Attachment 4, Section 3.1.	Noted. Arrow Energy has committed to investing up to $3.5 million for projects to offset or mitigate the impacts of the project (comparative with the other LNG proponents). Arrow will work with the Office of the Coordinator-General and the GRC to identify the most suitable mechanism to coordinate efforts across all proponents and identify projects that may provide equivalent offset or mitigation of impacts (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.2).
379	Rental cost has increased in Gladstone between 57% to 71% in the last three years. The accommodation requirements of the project must be in place at the time of demand for accommodation (i.e., when more than 400 project workers arrive in Gladstone). The Coordinator-General should condition the proponent to place workforce accommodation in advance of other project needs. GRC does not accept the 'low' significance of residual impacts should accommodation not be available.	LNG S030 LNG S031	**EIS** Attachment 7, Section 3.1. Appendix 20, Chapter 7. **SREIS** Attachment 4, Section 3.1.	The "low significance" residual impact ranking relates to the impacts associated with an increased use of temporary accommodation assuming that alternative third party provided construction camps can be provided at the ramp up period of construction (EIS Appendix 20, Social Impact Assessment, Chapter 7). The residual impact on housing costs and availability of affordable housing has been assessed as being of moderate significance. The housing and accommodation action plan outlined in the SIMP (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.1) includes actions to respond to impacts on the housing market. These actions will be refined as a part of the project accommodation strategies. In particular, Arrow Energy has committed to developing an early works workforce accommodation strategy to be finalised four months prior to construction commencing. The strategy will address how workers will be accommodated during the early works phase (EIS Attachment 7, and SREIS Attachment 4, Section 3.1).

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
393	Arrow to note that the EIS fails to acknowledge that there is a 'cost' for the social license to make Gladstone the home for the project. Community wellbeing is all about what Arrow will do for its employees; not addressing the impacts on the community.	LNG S030	**EIS** Attachment 7, Section 3.2. **SREIS** Attachment 4, Section 3.2	The Community Investment and Wellbeing Action Plan within the SIMP (EIS Attachment 7, Section 3.2) has been developed to manage impacts on social infrastructure and services and maximise community benefits from the project. Arrow Energy has also committed to investing up to $3.5 million for projects to offset or mitigate the impacts of the project (comparative with the other LNG proponents). Arrow Energy will work with the Office of the Coordinator-General and the GRC to identify the most suitable mechanism to coordinate efforts across all proponents and identify projects that may provide equivalent offset or mitigation of impacts. (EIS Attachment 7, SIMP and SREIS Attachment 4, Section 3.2).
394, 395	The percentage of single/family status FIFO workers who would seek to be relocated to Gladstone is not considered reasonable given recent studies in Western Australia. Explain this estimate. Also explain how Arrow can stipulate its workers be engaged as 'single status'.	LNG S030	**SREIS** Attachment 4, Section 2.3.1.	The percentage of single status FIFO workers during the construction phase that would seek to be relocated to Gladstone was based on the following assumptions: • Employment contracts will specify the position is FIFO. • The positions are trade specific and likely to be short term in nature. • FIFO rotations will not be attractive for family households with two or three weeks on and one week off. FIFO contracts will be based from the workers current home location, and will not include relocation of workers families. As such, workers will be flown to site unaccompanied, and returned to their home locations at the conclusion of their shift. Their status as single or otherwise is not relevant for the contract.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
396	No advice is given as to how provision for 'between 200 and 300 workers who will need to be accommodated on the mainland' is to be made. The Integrated Housing Strategy required of all the projects needs to clearly set out housing demands, timing and mitigation strategies and be approved before significant employees (400 or more) are engaged on the project. Details need to be set out simply and clearly in tabular form.	LNG S030 LNG S031	**SREIS** Attachment 4, Section 3.1.	An early works workforce accommodation strategy will be finalised four months prior to construction commencing (SREIS Attachment 4, SIMP Update, Section 3.1). The strategy will include measures to address demand for worker housing during the early works phase until final commissioning of the Curtis Island construction camp. Options that will be considered for worker accommodation include residential properties (depending on market conditions at the time), third party provided construction camp facilities, or another form of accommodation facilitated by the project, depending on accommodation availability. These detailed strategies will be incorporated into future updates to the SIMP.
397	Arrow has not articulated a dollar commitment to ULDA. Existing proponents have provided funding of $1.1 million through the Gladstone Affordable Housing Company (GAHC) as part of the $6.5 million commitment per proponent to GAHC. GRC suggest the decision as to whether to allocate these funds to ULDA should be left to GAHC. Where and how funds are to be allocated should be kept flexible and determined in consultation with GRC (e.g., re-allocation of funding to Phillip Street Community Project for provision of housing for the elderly). However, the proponent should be conditioned to provide $6.5 million to GAHC within 90 days of Financial Investment Decision for the project.	LNG S030	–	Arrow Energy will work with agencies such as the GAHC on how the $6.5 million funding commitment will be allocated. Arrow Energy has committed to investing up to $3.5 million for projects to offset or mitigate the impacts of the project (comparative with other LNG proponents). Arrow Energy will work with the Office of the Coordinator-General and GRC to identify the most suitable mechanism to coordinate efforts across all proponents and identify projects that may provide an equivalent offset or mitigation of impacts.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
398	Arrow's commitment to provide $1 million in financial assistance for emergency rental assistance should be discussed with GRC to determine the most effective use of the funds closer to the time of Financial Investment Decision. This fund should act as a 'top-up' to the existing joint program in place by other LNG proponents (this top-up function should be made clear in the SIMP).	LNG S030	**SREIS** Attachment 4, Section 3.1.	Arrow Energy has met with GRC to discuss the provision and distribution of $1 million for emergency rental assistance. Arrow Energy will continue to work with the council to develop the criteria and processes for accessing this funding to reflect local community needs (SREIS Attachment 4, SIMP Update, Section 3.1). The criteria will aim to complement any funding provided other LNG proponents.
399	There is no clear commitment to the Gladstone Foundation. The Coordinator-General is urged to condition a minimum payment (no less than $5 million) to the Gladstone Foundation which is to be paid within 90 days of Financial Investment Decision for the project (this is in addition to contribution sought for infrastructure).	LNG S030 LNG S031	**EIS** Attachment 7, Section 3.2. **SREIS** Attachment 4, Section 3.2.	Arrow Energy has committed to investing up to $3.5 million for projects to offset or mitigate the impacts of the project (comparative with other LNG proponents). Arrow Energy will work with the Office of the Coordinator-General and GRC to identify the most suitable mechanism to coordinate efforts across all proponents and identify projects that may provide an equivalent offset or mitigation of impacts. Arrow Energy will continue to consult with the GRC and RCCC to identify which social, community or recreational infrastructure is being directly impacted by the project, and to what extent, so that appropriate action can be taken (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.2).
400	There is no dollar commitment to the Brighter Futures Program. The proponent should target a minimum amount for disbursement in the Gladstone Regional Council area over a stated period of years.	LNG S030	**SREIS** Attachment 4, Section 3.2	A detailed response is provided in Section 4.8 of Chapter 4, Part B of the SREIS.
402	The proponent should coordinate and actively participate in the Gladstone Liquor Accord with respect to its workforce and any licensed premises run by contractors on its behalf. (GRC understands there has been difficult obtaining this commitment from other LNG proponents and their contractors).	LNG S030	–	Noted.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
404	The proponent is concerned that providing additional housing stock will create a surplus supply in 2016 and undermine the market. However, OESR population projections identify expectant annual growth of 3% for the region up to 2031 (effectively doubling the region's population from 53,941 in 2006 to 111,689 in 2031). This suggests an oversupply of housing is unlikely to be a problem in the medium to long term.	LNG S030 LNG S031	**EIS** Appendix 20, Section 5.4. **SREIS** Attachment 4, Section 3.1.	The EIS Social Impact Assessment (EIS Appendix 20, Section 5.4) states that there is currently an insufficient stock of housing to meet the forecast housing demand during construction and operation and that the private market is unlikely to be able to generate sufficient housing stock in time for construction. The demand on housing from other projects is likely to contribute to a continued shortfall in rental accommodation. The actions outlined in the housing and accommodation action plan in the SIMP Update (SREIS Attachment 4, Section 3.1) have been developed based on the assumption that the rental market will remain constrained during the construction and operations phases of the project. An early works workforce accommodation strategy, construction workforce accommodation strategy and an operations workforce accommodation strategy will be developed for the project based on current data available on the housing market at the time.
406	The report utilises a 5 step measure of impact which covers a spread of impacts and is practically logarithmic in its breadth. The Coordinator-General should: (a) Reject the methodology proposed in the EIS. (b) Continue its housing monitoring program. (c) Incorporate the requirement for this proponent to participate in quarterly reporting requirements. (d) Seek funding from the proponent for independent OESR research into the measurement of the housing demands in the Gladstone region from this project.	LNG S030	**EIS** Appendix 20, Section 2.	The impact assessment method used in the social impact assessment is widely recognised and is considered sound. The SIA method responds to the project Terms of Reference, takes account of relevant legislation, policy and guidelines and also draws on the approach taken in the EISs prepared by other LNG proponents in the Gladstone area (for which project approval had been given). As such, the method represents current good practice in social impact assessment. Arrow Energy will work with relevant agencies to establish appropriate mechanisms for providing funding to address a range of potential impacts of the project.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
407	Demand and impacts from sub-contractors and personnel to build additional infrastructure does not appear to have been considered. The Coordinator-General should require the SIMP and Integrated Housing Strategy to address issues of staff housing, as well as include commitments to Workforce Skilling Strategy and Gladstone Tender Ready Program.	LNG S030	**SREIS** Attachment 4, Section 3.1	The housing and accommodation plan in the SIMP Update (SREIS Attachment 4, Section 3.1) has been amended to clarify that all actions apply to Arrow Energy employees, EPC contractor and sub-contractors during the construction and operations stages. Arrow Energy will work with Skills Queensland and other relevant bodies to determine the most appropriate methods of addressing skilling needs. Arrow Energy has developed a draft Australian Industry Participation Plan (AIPP). The AIPP provides detailed information about the strategies and approaches that will be taken to: • Encourage contractors to source local goods and services where possible. • Encourage business to consider Indigenous procurement to maximise Indigenous employment opportunities. • Engage with key business bodies regarding appropriate opportunities for local businesses to supply goods and services to the project. The draft AIPP is being developed in consultation with the Federal government and Coordinator-General.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
432	GRC does not agree with the statement that the Gladstone Hospital has capacity for additional demands arising from the project. The Coordinator-General should condition the proponent to: (a) Liaise with Queensland Health and Gladstone Hospital to determine additional impacts. (b) Commit to a financial contribution of $5 million towards improved health services in Gladstone.	LNG S030 LNG S031	**EIS** Appendix 20, Section 5.7. **SREIS** Attachment 4, Section 3.6.	Section 5.7 of the EIS Social Impact Assessment (EIS Appendix 20) describes how workers and families living within the Gladstone area are expected to increase demand for services and facilities such as medical and emergency services. Arrow Energy has committed to communicate project activities, milestones, workforce numbers and other relevant information to appropriate state departments, including Queensland Health, to help plan for the demand on services. A detailed medical emergency response plan will also be developed which outlines key areas of social responsibility for personnel on site and the medical emergency facilities and resources available (SREIS Attachment 4, SIMP Update, Section 3.6). A range of medical emergency facilities and resources will be made available in accordance with the minimum standards set out in the Shell Exploration and Production Medical Emergency Response Guidelines (2005). These will be detailed in the medical response plan and include: • An appropriately designed on site medical facility • Trained medical personnel • First aid equipment • An appropriate method of transport from facility to shore • Remote medical support. A detailed medical emergency response study will be undertaken to assess transport times between the LNG plant and the mainland and determine whether required response times can be met. Arrow energy will also contribute to a common Curtis Island local emergency response strategy being developed by the various stakeholders involved in the Curtis Island LNG Projects.

Table 3.21 Issues register – Chapter 26: Social (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
433	Dredging works have been associated with significant negative publicity towards Gladstone Harbour, which affects perceptions of liveability and recreational value. The Coordinator-General should require the proponent to incorporate funded strategies within the SIMP to enhance the image of the Gladstone region and counter negative publicity.	LNG S030	–	Arrow is committed to contributing to the sense of liveability and lifestyle of the Gladstone region. Our Community Investment and Wellbeing Action plan identifies a range of strategies aimed at enhancing the social and community services. Included within our action plan is our Community Investment Program that is committed to managing the residual social impacts of its activities. Arrow has committed to work with the Office of the Coordinator General and Gladstone Regional Council to identify the most suitable mechanism to coordinate efforts across all proponents and identify projects that may provide an equivalent offset or mitigation of impacts, including those relating to the Gladstone Harbour.
434	There is an implicit social contract required of significant business in Gladstone. Other LNG proponents have made large contributions towards infrastructure (e.g., intersection upgrades $3 million plus, hospital facilities $2 million plus, other road upgrades $3 to 5 million plus. The Coordinator-General should either condition the proponent to contribute a further $5 million to the Gladstone Foundation, or identify and fund a project within the Infrastructure Strategic Plan to the value of $5 million.	LNG S030 LNG S031	**EIS** Attachment 7, Section 3.2. **SREIS** Attachment 4, Section 3.2.	Arrow Energy has committed to investing up to $3.5 million for projects to offset or mitigate the impacts of the project (comparative with other LNG proponents). Arrow Energy will work with the Office of the Coordinator-General and GRC to identify the most suitable mechanism to coordinate efforts across all proponents and identify projects that may provide an equivalent offset or mitigation of impacts. Arrow Energy will continue to consult with the GRC and RCCC to identify which social, community or recreational infrastructure is being directly impacted by the project, and to what extent, so that appropriate action can be taken (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.2).
435	GRC is of the view that contributions towards the Gladstone Foundation should be commensurate with the impacts of the project. The Coordinator-General should condition the proponent to contribute a total sum of $25 million (first two LNG trains) to the Gladstone Foundation within 90 days of Financial Investment Decision. If Trains 3 and 4 proceed, an additional $25 million should be paid.	LNG S030 LNG S031	–	Noted. Arrow Energy has committed to investing up to $3.5 million for projects to offset or mitigate the impacts of the project (comparative with other LNG proponents). Arrow Energy will work with the Office of the Coordinator-General and GRC to identify the most suitable mechanism to coordinate efforts across all proponents and identify projects that may provide an equivalent offset or mitigation of impacts.

Table 3.22 Issues register – Chapter 27: Economics

Issue No.	Issue	Submission No.	Response Reference	Comments
16	The EIS offers insufficient detail on the costs and negative externalities of decommissioning. Discussion should include the environmental costs of LNG technology becoming obsolete, or the risk that Arrow LNG gets priced out of Asian markets due to North American shale gas, or for some other reason.	LNG S003	**EIS** Chapter 3, Section 3.1. Chapter 6, Section 6.15.	A detailed response is provided in Section 4.9 of Chapter 4, Part B of the SREIS.
55	The effect of the Arrow LNG Plant on the exchange rate is likely to be small but this can be said of all mining projects. Cumulatively, mining projects have forced the exchange rate up. This has an effect on the whole Australian economy by putting pressure on other parts of the economy exposed to international competition. These include manufacturing, agriculture, tourism and international education. This has already had a negative impact on the Gladstone economy, which is highly dependent on the manufacturing industry.	LNG S013	**EIS** Appendix 21, Section 5.1.2.3.	Noted. The potential upward pressure of the project, and cumulative LNG exports, is discussed in EIS Appendix 21, Economics Impact Assessment, Section 5.1.2.3.
56	The EIS estimates that in the first three years, 1,601 jobs will be lost from other businesses, including 1,089 from manufacturing. This is of particular importance to a city like Gladstone due to the high dependence on manufacturing. Poaching may occur (including from manufacturing) and businesses may be forced to close down.	LNG S013	**EIS** Attachment 7, Section 3.4. **SREIS** Attachment 4, Section 3.4.	Noted. The potential for the Arrow LNG Plant to create a migration from other sectors to the LNG industry has been acknowledged. A recruitment plan that seeks to enhance local opportunities while seeking to reduce negative impacts on local services will be developed in consultation with the Department of State Development, Infrastructure and Planning (formally DEEDI), the CSG/LNG Skills Taskforce, and the CSG/LNG Steering Committee (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.4). Arrow Energy will also engage an Education and Training Coordinator to undertake regular reviews of labour requirements and current skills sets to ensure that training strategies meet these needs. The coordinator will work with the Social Investment Team and various state agencies and other skills bodies to conduct assessments of existing community skills.

Table 3.22 Issues register – Chapter 27: Economics (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
57	Arrow primarily plans to use FIFO workers (sourcing between 5 and 20% from the local area). Modelling done for the EIS indicates the project is expected to result in the loss of 385 jobs in Gladstone, primarily due to higher employment costs. Add this to the impact of exchange rates on manufacturing in Gladstone, and it is highly likely that more local jobs will be lost than created.	LNG S013	**EIS** Attachment 7, Section 3.5. SREIS Attachment 4, Section 3.5.	The Arrow LNG Plant is expected to require a long-term operational workforce of 600 personnel. Modelling undertaken for the EIS provides an estimate of potential job losses that may arise in other sectors due to the project. Strategies to maximise local business opportunities to supply goods and services to the project, and thereby maximise potential flow-on effects from the project, are described in the local content action plan of the SIMP and include the development of an Australian Industry Participation Plan and developing processes to ensure local business opportunities are considered in project procurement practises (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.5).
58	The EIS notes that Gladstone's property market is 'tight', rental vacancy rates are low, rental prices have risen sharply, and property prices have risen sharply. Higher accommodation costs are born not just by resource sector employees with rising wages, but other residents. There appears to be no requirement for FIFO workers to reside in workers camps. This will add pressure to the accommodation market.	LNG S013 LNG S031	**EIS** Attachment 7, Section 3.1. **SREIS** Attachment 4, Section 3.1.	A detailed response is provided in Section 4.9 of Chapter 4, Part B of the SREIS.
59	The Arrow LNG Plant will create cost of living pressures. Those most severely affected will be low income earners, which could further widen the gap between rich and poor in the region. The EIS acknowledges this could be an issue.	LNG S013 LNG S031	**EIS** Attachment 7, sections 3.1 and 3.2 **SREIS** Attachment 4, sections 3.1 and 3.2.	Noted. Strategies to address social impacts are set out in the SIMP and include strategies to minimise inflationary pressures on the local housing market, the displacement of vulnerable groups and impacts on social infrastructure and services (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Sections 3.1 and 3.2). Arrow Energy has also committed to providing GRC with $1 million for Emergency Rental Assistance and commenced discussions with GRC on the criteria and distribution processes for this funding.

Table 3.22 Issues register – Chapter 27: Economics (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
60	The project is expected to impact domestic gas prices. Historically, Queensland prices have been low. Modelling by Arrow indicates wholesale gas prices are expected to more than double by 2015. The price is then expected to rise higher by 2025. This will in turn have a significant impact on consumer gas prices for Queenslanders, and represent another cost of living increase.	LNG S013	**EIS** Chapter 27, Section 27.4.7. Attachment 7, sections 3.1 and 3.2. **SREIS** Attachment 4, sections 3.1 and 3.2.	Modelling undertaken for the EIS indicates that in Queensland, wholesale gas prices could rise between 8% and 14% as a result of the combined operation of the Arrow Energy LNG plant, QCLNG and GLNG projects, over the period 2020 to 2030. A range of strategies have been developed to minimise pressures on cost of living associated with the project, particularly on vulnerable groups. These measures are described in the SIMP and relate to minimising inflationary pressures on the local housing market, the displacement of vulnerable groups and impacts on social infrastructure and services (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Sections 3.1 and 3.2).
61	Staffing and profitability issues (both in Gladstone and elsewhere) are likely to be a major issue that affects other industries due to the project.	LNG S013 LNG S031	**EIS** Attachment 7, Section 3.5. **SREIS** Attachment 4, Section 3.5.	The local content action plan within the SIMP includes measures to be adopted to support local businesses in providing goods and services to the project in and retaining and recruiting employees in the face of increased completion (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.5). Measures include the development of an Australian Industry Participation Plan, processes to ensure local business opportunities are considered in project procurement practises and engaging with key business bodies regarding appropriate opportunities. Arrow Energy will also engage an Education and Training Coordinator to undertake regular reviews of labour requirements and current skills sets to ensure that training strategies meet these needs. The coordinator will work with the Social Investment Team and various state agencies and other skills bodies to conduct assessments of existing community skills.
62	Arrow's LNG Plant is expected to be extremely profitable. Profitability is shown in EIS estimates for tax revenue to the federal government in corporate tax payments. Queensland tax payments are expected to be smaller; averaging $13.8 million per year for the first 16 years of the project.	LNG S013	–	Noted. The Arrow LNG Plant will be supplied with gas from Queensland's Surat and Bowen basin gas reserves, which attracts the payment of royalties to the Queensland Government. This payment is in addition to other taxes that will need to be paid to local, state and federal governments.

Table 3.22 Issues register – Chapter 27: Economics (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
63	The LNG Project will have widespread negative economic effects. Net economic benefits for Gladstone and Queensland will be small. Gladstone can expect further dislocation including cost of living increases and more job losses from the manufacturing industry if the project goes ahead.	LNG S013	**EIS** Chapter 27, Section 27.4. Attachment 7, Section 3.5. **SREIS** Attachment 4, Section 3.5.	The EIS acknowledged the potential adverse impacts of the project on manufacturing and other business sectors in the Gladstone region. Economic modelling also indicated a range of increased opportunities stemming from the construction and operation of the project. The local content action plan within the SIMP includes measures to be adopted to maximise the opportunities for local businesses to benefit economically from the project (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.5).
297	When reporting at a regional level, labour force analysis using DEEWR data should be smoothed by taking 12 month moving average data supplied.	LNG S025	–	The 12 month moving data has been used and the longer time series has been rebased to the current data to ensure consistency.
307	EIS does not recognise tourism in any depth as an industry that may be impacted by the development. Consultation the relevant government department and discuss tourism impacts in the supplementary report to the EIS.	LNG S025 LNG S031	**EIS** Chapter 26, Section 7. Attachment 7, Section 3.9. **SREIS** Attachment 4, Section 3.9.	The social impact assessment undertaken for the EIS assesses the impact from the project on the tourism industry from a loss of temporary accommodation (EIS Chapter 26, Social, Section 7). Arrow Energy will continue to liaise with the tourism industry to address impacts associated with the project (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update, Section 3.9).

Table 3.22 Issues register – Chapter 27: Economics (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
408	The statement that the increase in the pressure on the rental market is attributable to 'factors such as workers from outside the region seeking local rental accommodation (to qualify under local content employment policies of major projects currently under development)' is either nonsense or a misleading statement. People do not generally move to inflated rental market areas in the hope of getting employment, and the Council is not aware of local content employment policies that would cause this aberration.	LNG S030	–	Noted. Arrow Energy is aware of some workers moving to resource areas with the intention of obtaining employment; the statement is not however meant to imply that this source is a major contributor to pressure on the rental market.
409	GRC does not accept the EIS rating of impact on housing prices and availability of affordable housing as 'minor'. Revise this assessment.	LNG S030 LNG S031	**EIS** Attachment 7. **SREIS** Attachment 4.	Noted. Arrow Energy has made several commitments to addressing impacts on housing affordability, including a specific action plan on housing and accommodation (EIS Attachment 7, SIMP, and SREIS Attachment 4, SIMP Update).
410	GRC queries the effectiveness of 'developing a recruitment plan to identify what positions will be targeted without negatively impacting on the availability of local services' given the skills drain and lack of effective strategy to date. The Coordinator-General should condition the proponent to liaise with local industry groups to identify strategies that will minimise loss of critical permanent staff to short term construction work (e.g., staff sharing/secondment; training and mentoring for individuals and suppliers; and accommodation subsidies).	LNG S030	**EIS** Attachment 7, Section 3.5. **SREIS** Attachment 4, Section 3.5.	Arrow Energy has made a number of commitments to reduce the impacts on local employment. These commitments are set out in the Local Content Action Plan contained in the SIMP (EIS Attachment 7, Section 3.5). The plan aims to manage impacts on local businesses and make it easier for existing businesses to retain and recruit employees in the face of increased competition. Actions include collaborating with the existing job service set up by other LNG proponents for local businesses and using this to advertise for local positions. This will allow applicants to choose between industry and non-industry jobs. Arrow Energy will also engage an Education and Training Coordinator to undertake regular reviews of labour requirements and current skills sets to ensure that training strategies meet these needs. The coordinator will work with the Social Investment Team and various state agencies and other skills bodies to conduct assessments of existing community skills.

Table 3.22 Issues register – Chapter 27: Economics (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
411	Council is concerned the economics presented in the EIS and resultant commitments does not adequately address concerns of local businesses. The proponent should: (a) give specific consideration to the development of procurement policies to enhance the prospects of smaller, local businesses. (b) work in partnership with the Industry Capability Network (Queensland) to meet obligations under the Australian Industry Participation Plan which align with the Queensland Local Industry Policy in the areas of building local supply capability and full fair and reasonable opportunity to local suppliers.	LNG S030	**EIS** Attachment 7, Section 3.5. **SREIS** Attachment 4, Section 3.5.	A detailed response is provided in Section 4.9 of Chapter 4, Part B of the SREIS.

Table 3.23 Issues register – Chapter 28: Traffic and Transport

Issue No.	Issue	Submission No.	Response Reference	Comments
53, 252, 260, 261	Describe the consultation undertaken with the LNG Maritime Movement Scheduling Committee, Maritime Safety Queensland, the Regional Harbour Master and the commercial shipping sector with regards to compliance with Port of Gladstone requirements for safe project shipping and marine construction vessel movement and scheduling, including dredges and pilotage requirements.	LNG S012 LNG S021	**EIS** Chapter 28, Section 28.1.5. **SREIS** Chapter 2, Section 2.2.1.	A detailed response is provided in Section 4.10 of Chapter 4, Part B of the SREIS.
80	Proposed access to Launch Site 1 is from Bryan Jordan Drive or Gladstone-Mt. Larcom Road. Appendix 23 nominates Alf O'Rourke Drive. Maps only illustrate access from Gladstone-Mt. Larcom Road. If alternatives are considered, include further details and illustrations.	LNG S017	**SREIS** Chapter 3, Section 3.4.	Access to the mainland launch site will be from Port Curtis Way via one of the three possible routes described in SREIS Chapter 3, Assessment of Alternatives. The options are shown on Figure 3.3 within that chapter.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
91, 259	The proponent should describe the nature and timing of the closure of Calliope River public boat ramp (owned by GPC), and mitigation strategies to reduce impacts on recreational boaters including alternative recreational boating facilities.	LNG S017 LNG S021	–	The direct impact of Arrow project development activities on boat ramps is discussed in the SREIS project description section 4.6 as follows: It was indicated in the EIS that marine facilities such as boat ramps in the Calliope River may be temporarily unavailable to local boating and fishing users at certain times throughout construction of launch site 1. Restriction of vessel movement (including speed and wash limitation) will be required in the vicinity of dredges that are moving due to safety considerations. Such restrictions may temporarily affect river usage. Whilst dredges are stationary but operating there will be speed and wash restrictions in the Calliope river adjacent to launch site 1. Public access to an unnamed boat ramp located immediately adjacent to launch site 1 will be permanently restricted as launch site 1 is developed. Access to this boat ramp has been restricted for some time due to the nearby haul road. Arrow Energy will notify the public in advance of any closures and limitations will be advised through 'notices to mariners'. Information on planned closures and limitations will be provided in accordance with MSQ requirements and in a timely manner that ensures potentially affected stakeholders are informed. Details of specific notification requirements will be set out in the marine activity management plan that will be developed prior to construction commencing. There is no expectation that the Calliope River boat ramp (near the NRG plant) will be closed at any time. It is however anticipated that dredging will result in an increased impact to this ramp during the lowest of low tides. This is discussed in Chapter 14.
93, 100	Provide further information and consult GPC regarding potential impacts to port roads, intersections and rail infrastructure (e.g., rail access to RG Tanna Coal Terminal). Acknowledge and assess the adverse impact of locating Launch Site 1 adjacent to the RGTCT and across from WICET.	LNG S017	**SREIS** Chapter 3, Section 3.5. Chapter 4, Sections 4.8 Chapter 20. Appendix 13.	A detailed response is provided in Section 4.10 of Chapter 4, Part B of the SREIS.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
94, 95, 240	Supply details of heavy vehicle transport of goods and materials to project sites, including traffic management and heavy vehicle parking. Assessment under GARID requires analysis of pavement impacts and road safety risks from project traffic. Early estimates are required to develop broad mitigation strategies which will be developed as more detailed estimates are available.	LNG S017 LNG S021	**SREIS** Chapter 7 Chapter 20, Section 20.5.2. Appendix 13, Section 5.5.2, 6.5, and 6.7.	A detailed response is provided in Section 4.10 of Chapter 4, Part B of the SREIS.
96	Supply detail of barges to be used by the project, including vessel types, numbers, movement and frequency during construction and operations. Consider vessel movements in light of experience of existing LNG proponents.	LNG S017	**SREIS** Chapter 7, Sections 7.1.1 and 7.2.1.	Estimated vessel movements during construction and operations are described in SREIS Chapter 7, Project Description: Logistics (Section 7.1.1 and Section 7.2.1 respectively). Arrow Energy is a member of relevant LNG proponent forums and will consider feedback from these forums in developing the marine activity management plan for the project.
97	Lack of assessment of impacts of maritime traffic associated with the project. The EIS should acknowledge the extra construction traffic Arrow will add to existing commercial traffic levels and assess mitigation strategies for identified impacts.	LNG S017	**SREIS** Chapter 7, Sections 7.1.1 and 7.1.2.	A detailed response is provided in Section 4.10 of SREIS Chapter 4, Part B of the SREIS.
101	Acknowledge and assess the project impacts of the proposed Hamilton South MOF on strategic port land.	LNG S017	**SREIS** Chapter 4, Section 4.1.	Hamilton Point South MOF has been discontinued as a project option. Boatshed Point is the preferred site for the MOF. Access to the GLNG pioneer MOF is still being investigated by Arrow Energy for the early works phase of construction.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
104	Include GPC in formal consultation with regard to the Traffic Management Plan. (No formal consultation on traffic undertaken as part of the EIS).	LNG S017	–	GPC will be consulted (where they are the relevant agency) on the development of various plans for the project including but not limited to: • Traffic management plan. • Marine activity management plan. • Marine operations maritime safety plan.
105, 256	How will pipe be delivered to site? Provide further detail on the use of Gladstone Port for pipe shipments, including vessel frequency and storage requirements. The proponent should consult with the Regional Harbour Master (Gladstone) to develop risk treatments and comply with Port Procedures and Information to Shipping Manual regarding pipe movement. It is likely Port Alma will be used to receive pipe.	LNG S017 LNG S021	**SREIS** Appendix 13, Section 5.5.3.	Pipe will be unloaded from cargo vessels. Pipe will be transported to the pipe laydown areas located near the mainland tunnel entry point. Curtis Island specific items may be landed at Boatshed Point; mainland specific items will be landed at ports other than Gladstone (to avoid adding to congestion in Port Central). Pipe for the harbour crossing is likely to be imported along with pipe for the Arrow Surat Pipeline (approved project).
106	Appendix 23 states Scenarios 1 and 2 are considered best by Coffey however the Executive Summary says Scenarios 1 and 5 are best for least impact on roads. Correct this inconsistency.	LNG S017	**SREIS** Chapter 20. Appendix 13.	Noted. Due to project description changes which have occurred since the EIS was finalised, scenarios and findings presented in SREIS Chapter 20 and Appendix 13 now supersede Appendix 23 of the EIS.
107, 118, 237	Confirm requirements for rail level crossings and provide details of any proposed crossing(s) including illustrations, geotechnical data for construction requirements, photographs of section of railway to be crossed, number and frequency of coal trains using the line, and assessment of practical alternative access strategies to enable guaranteed access to Launch Site 1. The railway manager and Queensland Rail Network should be consulted on all rail crossing issues.	LNG S017 LNG S021	**SREIS** Chapter 3, Section 3.4.	No rail crossings are anticipated to be required for the Arrow LNG Plant. Access options to launch site 1 from the Port Curtis Way – Red Rover Road intersection and Alf O'Rourke Drive were discounted as they involved railway crossings. Three options utilising the existing access road to the Calliope River Sewage Treatment Plant are still under consideration. These options are described in SREIS Chapter 3, Assessment of Alternatives. The options are shown on Figure 3.3 within that chapter. Arrow Energy will consult with the railway manager and Queensland Rail Network should the need for rail crossings arise during detailed design work for the project.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
109	Section 11 of Appendix 23 says shipping is dealt with in the 'Shipping Report', however this does not appear within the EIS. Clarify what constitutes the 'shipping report' and its location.	LNG S017	**EIS** Chapter 28. **SREIS** Chapter 7, Sections 7.1.1 and 7.2.1.	Shipping issues as described in the Terms of Reference for the EIS are identified and assessed in Chapter 28 of the EIS (Traffic and Transport). Estimated shipping movements within the harbour have been updated and are presented in SREIS Chapter 7, Project Description: Logistics.
238	Section 28.3.2 infers Queensland Rail is the railway manager for the Blackwater and Moura systems. This is incorrect and the networks are managed by QR Network Pty. Ltd. (a subsidiary of QR National Pty. Ltd.) Both QR National and Queensland Rail provide services on this system.	LNG S021	**SREIS** Appendix 13, Section 4.6.	Noted. References amended in SREIS Appendix 13, Traffic and Transport, Section 4.6.
239	Change references to Road Implementation Plan 2010-2011, to Queensland Transport and Road Investment Program 2010/11 – 2012/14 (QTRIP).	LNG S021	**SREIS** Appendix 13, Section 2.1.	Noted. References amended in SREIS Appendix 13, Traffic and Transport, Section 2.1.
241	The Assessment of Significance does not fulfil the requirements of the GARID – the road impact assessment must be undertaken in accordance with the GARID.	LNG S021	–	The assessment of significance was applied to the Traffic and Transport assessment in the EIS in addition to following the standard methodology in accordance with the GARID. The GARID assessment considers impacts for any section of a state controlled road where the construction or operational traffic generated by the development equals or exceeds 5% of the existing AADT on the road section, intersection movements or turning movements. Further assessment in the SREIS phase follows the GARID only. Updated information available on the transport of plant, personnel and materials to and from the LNG plant site including during the early works phase was used to update scenarios considered in this assessment.
242	Regarding Table 28.4, rather than state "infrastructure solutions may be required" for intervention statements for 'Major' risks, state "adequate impact mitigation is necessary".	LNG S021	–	Noted. The application of significance is not considered in the SREIS assessment (GARID only).

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
243	There is a need for collaboration and timely completion of management plans and resolution of negotiations to allow for design and construction of any hard infrastructure solutions to project transport impacts and apportioning of costs.	LNG S021	**EIS** Chapter 28, Section 28.2.7	Transport workshops were held with other LNG proponents and their transport consultants throughout the EIS process. Traffic data has been shared between LNG proponents for the purpose of assessing the combined impacts of LNG projects over and above other developments. Arrow Energy has been participating in the Road Transport Infrastructure Cumulative Impacts Study – Proposed LNG Industry Impacts facilitated by the Department of State Development, Infrastructure and Planning (formerly the Department of Infrastructure and Planning) which includes representatives of DTMR, GLNG, QCLNG and APLNG. This forum was set up to address the cumulative impact assessment on state road infrastructure and the apportionment of impacts by the respective projects. Arrow Energy will continue to work with forum members to further understand the project's contribution to the cumulative road impacts, once the detailed logistics strategy and associated traffic management plans have been developed. Plans will be developed in a timely manner in consultation with relevant agencies.
244	The supplementary report to the EIS should reflect the latest QTRIP. Consultation should be undertaken with regard to the latest updated regional transport planning that is underway.	LNG S021	**SREIS** Chapter 20, Section 20.3 Appendix 13, Section 2.1	Noted. QTRIP is discussed in SREIS Chapter 20, Traffic and Transport and Section 2.1 of Appendix 13, Traffic and Transport, and will be incorporated into the detailed transport planning being undertaken for the project prior to construction. Transport planning for the project will be undertaken in consultation with DTMR.
245	Assist Figure 28.3 interpretation by adding a legend explaining intersections, e.g., at a reduced scale between the Bruce Highway and Targinie Road.	LNG S021	**SREIS** Chapter 20. Appendix 13	A legend has been included on Figure 20.1 of SREIS Chapter 20, Traffic and Transport and Figure 4.2 of SREIS Appendix 13, Traffic and Transport, which supersede Figure 28.3 from the EIS.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
246	DTMR expects that moderate residual impacts should be addressed by the proponent (i.e., Intersection L: Dawson/Aerodrome Road).	LNG S021	**SREIS** Chapter 20, Section 20.5.2. Appendix 13, Sections 3.7 and 7.1	Noted – the updated traffic and transport assessment of impacts on key intersections has been undertaken in accordance with the GARID at the request of DTMR and no longer prescribes a level of significance to the impacts on each intersection. The requirement for intersection upgrades are proposed on the basis of the GARID 5% rule, level of service (LOS) and degree of saturation (DOS). See SREIS Appendix 13, Traffic and Transport (Section 3.7). Intersection upgrades are proposed in SREIS Section 7.1 of Appendix 13, Traffic and Transport and highlight where required upgrades differ from those planned by DTMR for key intersections in the Gladstone area.
247	Further information should be presented on the purpose of the logistics plan. Follow the draft guidelines on preparing a logistics plan.	LNG S021	**SREIS** Chapter 7. Chapter 20.	A detailed response is provided in Section 4.10 of Chapter 4, Part B of the SREIS.
248	In order of preparation the following transport related documents or plans are required: 1). Road Impact Assessment (following the GARID) 2). Road use management plan (documents latest traffic estimates and summarises final RIA once FID is made). 3). Logistics Plan documenting strategies to maximise transport logistics. 4). Traffic Management Plan demonstrating how road works will be safely undertaken in accordance with DTMR guideline.	LNG S021	**SREIS** Chapter 7. Chapter 20, Section 20.5.2.	A detailed response is provided in Section 4.10 of Chapter 4, Part B of the SREIS.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
249	Add objective to Box 28.1, add the objective to provide the latest estimates of traffic generation.	LNG S021	**SREIS** Appendix 13, Section3.	Noted. The updated traffic and transport assessment for the SREIS (Appendix 13) provides the latest estimates of traffic generation for the project and cumulative projects in the Gladstone region. Current traffic data has been obtained from a number of authorities including TMR and GRC for the Gladstone region. This data has specifically been collated for roads and intersections expected to be used by the project. The current traffic volumes were factored by growth rates (endorsed by TMR) based on suggested forecast growth in the Gladstone area. The design years chosen to assess the transport impacts have been based on key periods in the project's construction and operation schedule.
251	Further rail-related documents including the Australian Level Crossing Assessment Model (ALCAM) should be referenced.	LNG S021	–	No level crossings will be impacted by the project.
254	The proponent will be required to conduct and meet the costs of marine simulations of its proposed sites to ensure the feasibility of the locations, subject to the satisfaction of the General Manager, MSQ.	LNG S021	–	Arrow Energy, as a party to the LNG Simulations Group, working closely with Gladstone Ports Corporation and Maritime Queensland, has commissioned simulations for the safe navigation and mooring of LNG tankers. Arrow Energy's participation in this forum is ongoing. Arrow Energy has also carried out separate simulation exercises in conjunction with Maritime Safety Queensland and Gladstone Ports Corporation for construction vessel manoeuvres around the MOF and mainland launch site.
255	Describe ship sourced pollution management strategies for Curtis Island and mainland facilities. These must comply with the Transport Operations (Marine Pollution) Act 1995.	LNG S021	**EIS** Chapter 16, Section 16.8.	Arrow Energy has committed to developing spill response plans to cover marine activities, including all vessel operations. A number of other commitments, listed in EIS Chapter 16, Marine Water Quality, relate to managing waste from vessels and preventing spills.
257	At least 12 months prior to the first LNG shipment, the proponent should finalise and submit a Shipping Management Plan for approval, describing the agreed risk treatments to manage LNG shipping operations.	LNG S021	**SREIS** Chapter 20.	Arrow Energy has committed to developing a marine activity management plan. See SREIS Chapter 20, Traffic and Transport.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
264	Maritime Safety Queensland acknowledges the commitments pertaining to shipping included in Attachment 8 of the EIS.	LNG S021	–	Noted.
304	Existing LNG projects have already increased vehicle movements in Gladstone. Commit to the delivery of proposed upgrades to identified intersections in advance of project construction.	LNG S025	**SREIS** Chapter 20, Section 20.5.2. Appendix 13.	A detailed response is provided in Section 4.10 of Chapter 4, Part B of the SREIS.
403	Relevant plans (Gladstone Logistics Plan, Road Use Management Plan, Road Impact Assessment, Traffic Management Plan and Road Infrastructure Agreement) should be provided to GRC for approval for local roads traffic.	LNG S030	**SREIS** Chapter 20, Section 20.5.2.	SREIS Chapter 20, Traffic and Transport (Section 20.5.2) identifies the requirement for infrastructure agreements, including finalising the road impact assessment, road use management plan, logistics plan and traffic management plan.
413	The Gladstone Regional Council has adopted a Pavement Impact Assessment Model which the proponent will need to populate and supply. The Coordinator-General should condition the proponent to: (a) Enter into a Road Infrastructure Agreement with GRC similar to that the council has entered into with other LNG proponents. (b) Require the submission of the completed pavement impact assessment (utilising the GRC model) for assessment and approval by GRC.	LNG S030	**SREIS** Chapter 7, Sections 7.1.2 and 7.2.2. Appendix 13, Section 6.5.	Updated information on the transport of plant, personnel and materials to and from the LNG plant site including during the early works phase was used to update scenarios considered in the traffic and transport assessment. Information pertaining to heavy vehicles is discussed in SREIS Section 5.5.2 of Appendix 13, Traffic and Transport, and in SREIS Chapter 7, Project Description: Logistics (Section 7.1.2 and Section 7.2.2). The Pavement Impact Assessment is described in SREIS Section 6.5 of Appendix 13, Traffic and Transport. Identification of pavement impacts to Council-Controlled roads was not undertaken at the time of this report, but will be undertaken at a later stage when the pioneer site location has been confirmed, and when more detailed information is available. Notwithstanding, when the pavement impact assessment for Council Controlled Roads is conducted, the assessment shall be undertaken in accordance with the GRC 'Pavement Impact Assessment Guidelines' (GRC, 2010).
414	Figure 28.2 incorrectly names Calliope River Road and Targinnie Road. Correct this figure by swapping the two road names. (Targinnie Road is north of Gladstone-Mt. Larcom Road).	LNG S030	**SREIS** Chapter 20. Appendix 13.	Noted. All figures in both the SREIS technical study (Appendix 13) and Chapter 20, Traffic and Transport, which show these roads are labelled correctly.

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
415	Calliope River Road is an approved B-double route (not shown as such on the figure) and is generally used by project traffic as a more practical access from the Bruce Highway to areas such as Fishermans Landing. Correct figure.	LNG S030	**SREIS** Appendix 13, Section 4.2.	Noted. Calliope River Road is listed as an approved B-double route in Figure 4.1 of the SREIS Appendix 13, Traffic and Transport.
416	Table 28.01 purports to identify impacts of more than 5% including local roads. Council does not use the DTMR Guideline of 5% cut-off.	LNG S030	–	GRC does not have a policy or guideline which details requirements for operational assessments of road links or intersections. In the absence of such documentation, the GARID methodology, which is used state-wide, has been used as the basis of the road impact assessment. This guideline is based on a 5% threshold where impacts are considered relatively minor if less than this value. It is appreciated that GRC does not consider the GARID methodology to be suitable for use in assessment of Council roads, although, an alternate approach has not been suggested. GRC does have a guideline in relation to calculation of pavement impact assessments. This guideline shall be used in the assessment of pavement impacts for Council controlled roads.
417	Traffic movement for the tunnel workforce has been excluded. The Coordinator-General should require all project generated traffic to be reported on in approvals documentation.	LNG S030	**SREIS** Chapter 20, Section 20.4. Appendix 13, sections 5.3 and 5.4.	Traffic movement for the tunnel workforce is included in updated modelling undertaken for the traffic assessment for the SREIS (Chapter 20, Traffic and Transport and Appendix 13).
418	The estimate of 1,000 external personnel commuting daily to the mainland launch site is considered too high. The Coordinator-General should condition the proponent to: (a) put in place car/bus interchange points for the collection of project staff housed on the mainland. (b) actively discourage individual worker vehicle trips by limiting car parking or making bus transportation a condition of employment.	LNG S030	**SREIS** Chapter 4, Section 4.8.	Car parking at the mainland launch site has been reduced, as forecast congestion at roundabouts on Port Curtis Way (particularly at its intersection with Blain Drive and Red Rover Road) makes it prudent to develop a staging area from which workers would be bussed to and from the mainland launch facility. Two potential sites for staging areas have been identified and are under consideration, at Red Rover Road and TWAF 7 (SREIS Chapter 4, Project Description: LNG Plant, Section 4.8).

Table 3.23 Issues register – Chapter 28: Traffic and Transport (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
419	GRC note that traffic movement to TWAFs are not able to be finalised until the actual TWAF locations on the mainland are known.	LNG S030	**SREIS** Chapter 20. Appendix 13.	Noted. Revised personnel transport scenarios, which account for alternative mainland accommodation options, have been used for the supplementary traffic and transport assessment (Chapter 20, Traffic and Transport and Appendix 13).
420	Table 28.11 and preceding commentary make it clear that the proponent has not seriously considered the Council's advice to utilise Don Young Drive/Red Rover Road in lieu of the Dawson Highway. The Coordinator-General should condition the proponent to: (a) liaise with and seek approval from GRC/DTMR with regard to heavy vehicle routes. (b) ensure contractors are required to use roads agreed with GRC/DTMR. (c) ensure these routes are reflected in the pavement/roads impact assessments.	LNG S030	–	The traffic management plan for the project will be developed in consultation with DTMR and GRC. The traffic management plan will include measures to address public safety at project sites, avoid obstruction to other road users, address seasonal weather influences on transport arrangements, and manage associated issues including driver fatigue. The traffic management plan will address the movement of heavy vehicles (including routes) and oversized loads. The contractor will be required to use roads as set out in various plans including the road use management plan, logistics plan and traffic management plan. A final road impact assessment (including pavement impact assessment to determine infrastructure contributions) will be undertaken at the time the road use management plan, logistics plan and traffic management plan are finalised.
421	Council is experiencing significant quantities of heavy vehicles being parked in residential, commercial and industrial areas. The Coordinator-General should condition the proponent to: (a) require contractors to provide and utilise legal locations for heavy vehicle parking. (b) require contractors to provide transport from legal locations to accommodation facilities.	LNG S030	**SREIS** Chapter 20. Appendix 13.	Noted. SREIS Chapter 20, Traffic and Transport (Section 20.5.2) identifies the requirement for infrastructure agreements, including finalising a road impact assessment, road use management plan, logistics plan and traffic management plan. These plans will be developed in conjunction with the EPC contractor. The use of heavy vehicles in residential, commercial and industrial areas will be covered in such plans including heavy vehicle routes and areas that these vehicles may be parked.
422	The Coordinator-General should note and condition the proponent to comply with the terms of the agreement entered into with Gladstone Regional Council to partially fund the new instrument landing system at the Gladstone Airport.	LNG S030	**EIS** Chapter 28, Section 28.3.3.	Noted. During September 2011, LNG proponents for the APLNG, GLNG and QCLNG projects, and the Arrow LNG Plant committed to provide $10.5 million in funding to upgrade the airport's instrument landing system. The upgrade will improve the ability of aircraft to land at the airport during adverse weather conditions and reduce the diversion of flights to Rockhampton. Arrow Energy has committed to provide its share of this funding at project final investment decision (FID) (Commitment 28.08).

Table 3.24 Issues register – Chapter 29: Hazard and risk

Issue No.	Issue	Submission No.	Response Reference	Comments
20	Consult with QAS in relation to: displacement of critical community members in the housing market; treatment plans for injured workers (onsite chemical processes); unloading/loading facilities for injured workers and transport to/from Curtis Island; development and testing of Emergency Response Plans; first aid facilities, locations and evacuation procedures for TWAFs; traffic management plans in relation to delays to traffic flow; paramedical service on site for construction and operation; notification of planned exercises requiring QAS involvement.	LNG S004	**EIS** Chapter 29, Section 29.6.2.	As noted in EIS Chapter 29, Hazard and Risk, Arrow Energy will consult with relevant Queensland government authorities and emergency services organisations including QAS on all emergency management planning for the project. These plans will include a detailed medical emergency response plan and traffic management plan. A range of medical emergency facilities and resources will be available on site including a medical facility, trained medical personnel, first aid equipment, transport facilities, and remote medical support. As discussed in EIS Chapter 29, Section 29.6.2, a detailed medical emergency response study will also be undertaken prior to construction commencing to assess transport times and to determine that response times can be met.
21	Provide further detail to QAS on: whether construction camps will be alcohol free; fatigue management policy in relation to roster shifts and pre- and post-shift; Major Emergency Incident Plan; any road diversions or other closures to the Ambulance Communication Centre; methods and equipment to be used in the transfer of injured persons from the island; possible landing sites for rescue helicopter services / fixed wing aircraft services if required (including landing zone, flight paths, lighting and wind sock).	LNG S004	**EIS** Attachment 7, Section 3.6.	A detailed response is provided in Section 4.11 of Chapter 4, Part B of the SREIS.

Table 3.24 Issues register – Chapter 29: Hazard and risk (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
24	EIS identifies an anticipated 5% increase in average daily traffic. An increase in transport emergencies will result in greater number of responses by QFRS requiring specialized equipment. QFRS currently does not have the capacity to respond specialized equipment on initial response. Additional staffing is required to enable flexible response of primary resources.	LNG S004	–	Noted.
25, 26	Queensland Fire and Rescue Service (QFRS) requests to be engaged as a referral agency under the Sustainable Planning Regulation 1998 to provide advice on any special fire services to be installed or alternative solutions required for structures and buildings. Also consult QFRS on the development of the emergency management and response plan and provide QFRS crews with site familiarisation and maps identifying access points to, from and within the project area.	LNG S004	–	Noted. Arrow Energy has committed to ongoing consultation with relevant agencies in developing the various management plans required for the project. QFRS will be consulted on the development of an emergency response plan which will identify areas of responsibility and include procedures for coordination with QFRS in the event of an emergency.
27, 401	Fire-fighting equipment must be compatible with Queensland fire and rescue service resources and equipment. The proponent should coordinate with other LNG proponents to maximise the standardisation of emergency equipment and procedures across projects.	LNG S004 LNG S030	–	Noted. Arrow Energy will continue to liaise with other LNG project proponents on a range of issues and procedures of common interest. In particular, Arrow Energy will contribute to a common Curtis Island local emergency response strategy being developed by the various stakeholders involved in the Curtis Island LNG projects.

Table 3.24 Issues register – Chapter 29: Hazard and risk (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
32	No mention was made in regards to traffic and road safety, in particular with regard to driver fatigue. The traffic and transport section could be split to include a section on road safety strategies.	LNG S007	**EIS** Chapter 28, sections 28.4.1 and 28.5.1 Chapter 29, sections 29.1 and 29.4.	Road safety, including driver fatigue is considered in EIS Chapter 28, Traffic and Transport (sections 28.4.1 and 28.5.1); and EIS Chapter 29, Hazard and Risk (sections 29.1 and 29.4). The safety of all road users will be a key consideration in the final choice of haulage routes and access points for the project. For example, only qualified fuel transport operators will be utilised on the project. Arrow Energy's 12 Life Saving Rules, which include requirements on safe driving, will be adopted. A detailed traffic management plan will be developed in consultation with the Department of Transport and Main Roads and GRC prior to construction commencing. The plan will include measures to ensure public safety for all road users and manage issues such as driver fatigue.
34	HICB do not have any objections to the project as presented. Further demonstration of project compliance with the Work Health and Safety Act 2011 may be required. This is in accordance with commitments C29.01 and C29.02 in the EIS.	LNG S009	–	Noted.
99	Include the risks associated with bulk fuel transfers in the hazard and risk assessment.	LNG S017	**EIS** Chapter 29. Appendix 24.	A detailed response is provided in Section 4.11 of Chapter 4, Part B of the SREIS.
173	The preliminary safety management study (Appendix 25) focuses on the feed gas pipeline. What safety risks does the LNG plant pose? What response plans will be prepared to manage natural events such as earthquake and floods? Address in the supplementary EIS.	LNG S018	**EIS** Chapter 29. Appendix 24.	A preliminary hazard and risk assessment was undertaken on the Arrow LNG Plant and included as EIS Appendix 24, Confidential Appendix. EIS Chapter 29, Hazard and Risk presents the key findings of this study.
262	Prior to construction a cyclone contingency plan must be submitted for endorsement.	LNG S021	–	Noted.

Table 3.24 Issues register – Chapter 29: Hazard and risk (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
423	The Coordinator-General should condition the proponent to actively consult GRC with respect to emergency management planning of all aspects of the project that may impact on GRC's emergency management responses.	LNG S030	–	Noted. Arrow Energy is committed to ongoing consultation with relevant agencies in developing the various management plans required for the project. GRC will be consulted on the development of emergency response plans which will include procedures for coordination with the council.

Table 3.25 Issues register – Chapter 30: Land use and planning

Issue No.	Issue	Submission No.	Response Reference	Comments
75, 114	Reassess potential project impacts in the context of the latest Gladstone Ports Corporation Land Use Plan, gazetted in February 2012. Update mapping accordingly.	LNG S017	–	Arrow Energy has consulted regularly with GPC on its proposed development to ensure it integrates with the GPC Land Use Plan 2012. The assessment completed in the EIS and the review of the February 2012 update conducted for the SREIS confirm that the project activities are consistent with the GPC Land Use Plan 2012, and the GPC Port of Gladstone 50 year strategic plan strategic plan, 2008.
115	Address TOR Section 3.2.3.2. Assess proposed land uses in relation to 'disruption, severance and fragmentation'. Note that proposed facilities are consistent with port planning documents and plans and use of SPL. Do not mention the potential impacts of using Hamilton Point South in Section 5.5, 5.7 of Appendix 28.	LNG S017	**EIS** Chapter 30, Section 30.4.7. **SREIS** Chapter 3, Section 3.1.	Land use and planning is addressed in EIS Chapter 30, Land Use and Planning, which describes the consistency of the project with the long term policy framework for the study area. Potential impacts to proposed land uses in relation to disruption, severance and fragmentation are discussed in Section 30.4.7. Potential impacts to Strategic Port Land development opportunities at Hamilton Point are discussed in Section 30.4.7 of the EIS. The Hamilton Point South MOF option has been discontinued and no longer forms part of the Arrow LNG Plant (SREIS Chapter 3, Assessment of Alternatives Update, Section 3.1).
308, 310	Rename the heading in Section 30.3.4 to Extractive, Mineral and Petroleum and Gas Deposits (due to Stuart Oil Shale), and provide detail of the feed gas pipeline in shape file format to assess conflict with other developments in the area. The accuracy of data needs to be checked against the Interactive Resource and Tenure Maps. Verify that tenure holders for mining leases, mineral development licenses and pipeline licenses have been consulted in the EIS process (refer to the full list of tenure holders included in the submission). The proponent should ensure they have been consulted and provide details of this consultation.	LNG S025	**SREIS** Chapter 2. Chapter 5. Appendix 16.	Renaming comment is noted. Updated details of the feed gas pipeline alignment are contained in the SREIS in Chapter 5, Project Description: Feed Gas Pipeline. The final detailed alignment of the pipeline will be developed during the detailed design phase of the project. Arrow Energy's current and proposed engagement activities with landholders align with the Queensland Land Access Code under Section 24A of the Petroleum and Gas Act 2004. This engagement process is ongoing, will continue through subsequent phases of the project, and will include all tenure holders as required. SREIS Chapter 2, Consultation and Communication Update provides an update on consultation undertaken for the project in the period July 2011 to June 2012. Further details are also contained in SREIS Appendix 16, Supplementary Consultation Report.

Table 3.26 Issues register – Chapter 31: Waste management

Issue No.	Issue	Submission No.	Response Reference	Comments
124	A breakdown of discharge contributing components in equivalent persons is not provided for sewage at the site (i.e., where flows come from such as common amenities, cabins, laundry, etc.)(see section 6.4.3). This information is needed to assess the ERA. The EIS needs to demonstrate the disposal of treated effluent relates to the waste management hierarchy. Benchmark the proposed method against alternatives (e.g., Gladstone sewage treatment) and practice treatment technology and other options available prior to opting for marine discharge.	LNG S018	**EIS** Chapter 31, Section 31.6. Appendix 29, Section 6.2.	Estimated sewage generation rates are provided in EIS Appendix 29, Waste Impact Assessment (Chapter 6, Section 6.2 and Table 6.3) and are summarised in EIS Chapter 31, Waste Management (Table 31.1). Further information for the assessment of ERAs for licensing purposes will be provided in the environmental authority application. The hierarchy adopted for the management of general and regulated waste generated through construction, operations and maintenance activities for the project is discussed in EIS Chapter 31, Section 31.6. The supply of mains water to Curtis Island via a pipeline installed by GAWB and two sewer mains under Port Curtis to service the LNG plants on Curtis Island by GRC, has provided an opportunity for direct supply of water from, and discharge of wastewater to, the mainland and is now the base case for the project. The sewer mains are expected to have a capacity of 864 m^3 per day, which will be sufficient to meet peak construction demands for both the LNG plant and construction camp. On site effluent treatment remains as a project option.

Table 3.26 Issues register – Chapter 31: Waste management (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
125	The EIS does not contain adequate detail on expected quantity or types of waste generated. Waste streams not routinely managed by the waste industry in the local area need to be identified and proposed management actions identified. Group in terms of general solid waste streams; regulated solid waste streams; general liquid waste streams; regulated liquid waste streams; gaseous waste streams. Discuss in terms of 'storage facilities and methods' and 'proposed management actions'. Identify those waste streams not routinely handled in Gladstone.	LNG S018	**EIS** Chapter 31, Sections 31.3, 31.4, and 31.6. Appendix 29, Section 6.	Expected quantity and types of waste generated (solid, liquid and gaseous wastes) are detailed in EIS Appendix 29, Waste Impact Assessment (Chapter 6 and tables 6.1 and 6.2) and are further summarised in EIS Chapter 31, Waste Management (sections 31.3 and 31.4, and Table 31.1). The assessment was presented on the data available prior to completion of front end engineering design of the LNG plant and was based on Shell's knowledge and experience of wastes generated at similar LNG facilities it has constructed and operates. An assessment of the local and regional waste management infrastructure, including available waste contractors and disposal and recycling facilities is described in EIS Appendix 29, Section 5.2 and in EIS Chapter 31. Licensed waste contractors and disposal facility operators will be consulted prior to construction. The detailed waste management strategies for each type of waste are included in EIS Appendix 29 in Section 8 and Table 8.1 and summarised in EIS Chapter 31, Section 31.6.4. Table 8.1 groups each type of waste in terms of 'general solid waste streams', 'regulated solid waste streams', etc. The hierarchy for the management of waste from the project is summarised in EIS Chapter 31, Section 31.6, and includes proposed management strategies for storage and handling.
265	Include ship sourced pollution (sewage, garbage, oil) in the Arrow LNG Plant Waste Impact Assessment.	LNG S021	**EIS** Chapter 31, Section 31.4. Chapter 16. Chapter 19. Appendix 29, Section 8.8.4.	Ship sourced pollution is discussed in EIS Appendix 29, Waste Impact Assessment, Section 8.8.4 and summarised in EIS Chapter 31 Waste Management, Table 31.1. All ship sources of potential pollution will be managed in compliance with the International Convention for the Prevention of Pollution from Ships (MARPOL) and the Australian Quarantine and Inspection Services Australian Ballast Water Management Requirements (AQIS, 2008). Impacts of waste on environmental values are discussed throughout appropriate sections of the EIS. In particular, potential impacts of marine waste on water quality and marine ecology are discussed within EIS Chapter 16, Marine Water Quality and Sediment and Chapter 19, Marine and Estuarine Ecology respectively.

Table 3.26 Issues register – Chapter 31: Waste management (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
381	The Coordinator-General should condition the proponent to update the waste management plan for the project, including provision of more accurate projections of waste types and quantities, and seek approval of the plan from Gladstone Regional Council. The party responsible for overseeing the waste management plan must also be nominated.	LNG S030	**EIS** Chapter 31, Section 31.8.	Arrow Energy will review and revise its estimates of waste to be produced by the project through the detailed design phase and prior to construction. Contractors will be required to produce and implement waste management plans in accordance with Arrow Energy's Health, Safety and Environmental System and the specific waste management commitments included in EIS Chapter 31, Waste Management, Section 31.8 (Table 31.3). Arrow Energy will consult with appropriate stakeholders including GRC in selecting appropriate management and disposal facilities and methods to be included in the waste management plans.
425	There is only one landfill site within the Gladstone Regional Council area, not several as indicated. Update in appropriate documentation.	LNG S030	**EIS** Chapter 31, Section 31.5.1.	EIS Chapter 31, Waste Management, Section 31.5.1, states 'There are several landfills within or surrounding the project area'. The project area incorporates Benaraby Regional Landfill which is operated by GRC; and also several smaller landfills in the GRC area for domestic waste, which are not available for commercial waste generators.

Table 3.26 Issues register – Chapter 31: Waste management (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
426	The quantum of 1,364,100 t of waste over 30 years represents 45,000 t per annum which would reduce the Benaraby landfill life from 30 years to 15 years. This needs to be checked as it is inconsistent with the estimate of 562,200 t over 30 years by cumulative projects. The Coordinator-General should condition the proponent to review the level and types of waste expected and update appropriate documentation.	LNG S030	**EIS** Chapter 31, sections 31.5.1 and 31.5.4.	EIS Chapter 31, Waste Management, Section 31.5.1 identifies that a minimum of approximately 1,364,100 t (over a period of 30 years) of solid waste will be generated by Arrow Energy and other commercial waste generators in the area. A minimum of 563,200 t of this waste is estimated to require disposal by a licensed contractor over a period of 30 years (Section 31.5.4). Approximately 1.3% of waste requiring disposal by a licensed waste management contractor is predicted to be generated by the Arrow LNG Plant. Assuming that all solid waste will be disposed of at the Benaraby Regional Landfill, the operating life is unlikely to be reduced below the current licensed life span of 30 years. The licensed disposal rate of 50,000 t per annum will only be compromised if construction of the proposed multiple projects occurs simultaneously, as the majority of waste will be generated during construction activities. Should this occur, waste generators will need to find temporary storage or alternative disposal options. Alternatively, disposal charges may be incurred to compensate for the additional resources required to manage the waste. Arrow Energy will review and revise its estimates of waste to be produced by the project through the detailed design phase and prior to construction. Contractors will be required to produce and implement waste management plans in accordance with Arrow Energy's Health, Safety and Environmental System and the specific waste management commitments included in EIS Chapter 31, Section 31.8, Table 31.3.
427	The quantity of waste to be disposed of in the Benarby landfill will bring forward the date from which the council will be subject to carbon pricing mechanisms. The Coordinator-General should condition Arrow to fund an update to GRC's studies on carbon pricing and compensate GRC for additional costs identified as a result of the project.	LNG S030	**EIS** Chapter 31, Section 31.8.	Noted. Arrow Energy will review and revise its estimates of waste to be produced by the project through the detailed design phase and prior to construction. Contractors will be required to produce and implement waste management plans in accordance with Arrow Energy's Health, Safety and Environmental System and the specific waste management commitments included in EIS Chapter 31, Waste Management, Section 31.8, Table 31.3.

Table 3.26 Issues register – Chapter 31: Waste management (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
440	The majority of waste generated during the construction phase will be transferred to local landfills and licensed facilities. Some waste can be transferred on return trips of vessels delivering products to Curtis Island, however it is likely that some of the waste generated will require specific transport modes to and from Curtis Island.	LNG S017	–	Noted. The transportation of waste will be included within the shipping activity management plan to be developed in consultation with Gladstone Regional Council, Gladstone Ports Corporation, Maritime Safety Queensland and all contractors operating within the Gladstone Port.

Table 3.27 Issues register – Chapter 32: Cumulative impacts

Issue No.	Issue	Submission No.	Response Reference	Comments
4, 8	The final EIS should assess the cumulative impact of all fossil fuel exports from Australia for end-use electricity generation, with respect to climate change.	LNG S001 LNG S002	**EIS** Chapter 32, Section 32.2.2.	EIS Chapter 32, Cumulative Impacts, Section 32.3.2 states that cumulative impacts associated with greenhouse gas emissions for the project were assessed as negligible. The predicted greenhouse gas CO2-e emissions for the worst-case Arrow LNG Plant operational year, when compared to 2007 emissions, was equivalent to 0.028% of global emissions from fossil fuel consumption.
36	Significant issues have arisen relating to dredging and water quality since the commencement of preliminary studies. These have not been fully considered in the EIS.	LNG S010	**SREIS** Chapter 13, Section 13.5. Appendix 5.	A supplementary marine water quality study has been conducted by CQU for the SREIS to address changes made to the project description, review additional water quality data including from recent monitoring programs carried out in Port Curtis and supplement water quality monitoring undertaken for the Arrow LNG Plant EIS. The results of the additional water quality analysis are provided in SREIS Appendix 5, Marine Water Quality Report, and are summarised in SREIS Chapter 13, Marine Water Quality, Section 13.5.
38	Avoid the Calliope River launch site option. Option 4N at the Western Basin Reclamation Area for the mainland launch site involves fewer environmental concerns. The dredging footprint should not be extended to the mouth of the Calliope River.	LNG S010	**EIS** Chapter 6, Section 6.6. **SREIS** Chapter 3, Section 3.4.	Two options were presented in the EIS for the location of the mainland launch site (Chapter 6, Project Description: LNG Plant, Section 6.6); launch site 1 situated on the former Gladstone Power Station ash ponds adjacent to the RG Tanna Coal Terminal and Calliope River (preferred), and launch site 4N at the northern end of the as-yet-to-be completed Western Basin Reclamation Area. Launch site 1 was confirmed as the preferred mainland launch site following FEED. Launch site 4N is still viable but dependent, in part, on the timing of completion of filling and stabilisation of the Western Basin Reclamation Area, which is proceeding from south to north.

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
40	There appears to be no commitment in the EIS to a rigorous process of assessment in relation to cumulative need of the community for services. DCCSDS requests more comprehensive mitigation strategies and planning commitments in relation to child care services; early childhood and allied health services; and community health services and infrastructure.	LNG S011 LNG S031	**EIS** Chapter 26, sections 26.6.6 and 26.6.9. Chapter 32, Section 32.3.3. Attachment 7. **SREIS** Attachment 4, Section 3.6.	Cumulative social impacts are discussed in EIS Chapter 32, Cumulative Impacts, Section 32.3.3. Mitigation strategies to address potential impacts of the project on social and community infrastructure within the Gladstone area are discussed in EIS Chapter 26, Social, in Section 26.6.6. Avoidance, mitigation and management measures relating to community health and wellbeing are discussed in EIS Chapter 26, Section 26.6.9. To avoid pressure being placed on local health services and infrastructure, Arrow Energy will provide an on-site health service for the workforce on Curtis Island and will liaise with emergency services and Queensland Health in planning this facility. The community health and safety action plan within the SIMP (EIS Attachment 7 SIMP, and SREIS Attachment 4 SIMP Update, Section 3.6) includes a range of measures to manage impacts on existing health and community services. Arrow Energy will liaise with Queensland Health and other relevant agencies to refine these measures prior to construction commencing.
51	No assessments have been made in relation to the cumulative impacts of dredging and loss of marine habitats in the Western Basin Dredging and Disposal Project and the Arrow dredge projects (refer sections 8.1, 32.3.5). Little responsibility is taken by Arrow, except to state the project is adding to existing infrastructure in the region.	LNG S012	**EIS** Chapter 32, Section 32.3.5.	A detailed response is provided in Section 4.12 of Chapter 4, Part B of the SREIS.

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
54	Cumulative impacts relating to increased vessel frequency (see section 32.3.5) will also have impacts on commercial fishing activity in the region.	LNG S012	**EIS** Chapter 26, Section 26.5.8. Chapter 32, Section 32.3.5.	Cumulative impacts to the marine environment (including the cumulative impacts of shipping) are discussed in the EIS in Chapter 32, Cumulative Impacts, Section 32.3.5. Arrow Energy acknowledges that permanent loss of public access for recreational and commercial boating and fishing activities will occur along the foreshore of the Curtis Island Industry Precinct, through establishment of exclusion zones around the four LNG plants. The LNG Maritime Movement Scheduling Committee will manage and monitor marine construction traffic travelling from the mainland to Curtis Island to reduce cumulative impacts of this traffic in the harbour. During the construction and operation phases of the Arrow LNG Plant, marine and estuarine exclusion zones will need to be created for the safety and security of both employees and the community, as well as for the overall security of the project. As described in Section 26.5.8 of the EIS, recreational activities are known to occur in some of the areas that will be impacted by the exclusion zones, therefore impacting the ability of recreational boats to use certain areas within Port Curtis. During operations, the exclusion zones will be localised to the Arrow LNG Plant marine facilities and the LNG ships. The fixed safety zones will not impede the passage of recreational boats, including between South Passage Island and the terminal jetty on Curtis Island. The placement of exclusion zones in the harbour is expected to have a minimal impact on existing recreational uses, even when the cumulative impacts of other projects in the region are considered due to their localised nature. Arrow Energy will prohibit non local construction workers and operators from engaging in fishing, crabbing or boating in any exclusion zone.

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
68	Proponent has failed to adequately address cumulative impacts of shipping on environmental values. The proponents should be required to describe these impacts and provide data including the number of shipping movements.	LNG S014	**EIS** Chapter 32, Section 32.3.5. Chapter 28, Section 28.4.5. **SREIS** Chapter 7, sections 7.1.1 and 7.2.1. Chapter 15, Section 15.6.3. Appendix 8.	A detailed response is provided in Section 4.12 of Chapter 4, Part B of the SREIS.
70	Clarify Arrow's involvement with the cooperative model currently operating in Gladstone that includes participation by other LNG proponents, Gladstone Regional Council and Gladstone Affordable Housing Company.	LNG S016	**EIS** Chapter 4, Section 4.2.4. Attachment 7, Section 3.2. Appendix 30. **SREIS** Attachment 4, sections 3.2 and 3.8	A detailed response is provided in Section 4.12 of Chapter 4, Part B of the SREIS.
108	There does not appear to be an assessment of cumulative construction marine traffic within the EIS. Assessment of impacts and mitigation strategies required.	LNG S017	**EIS** Chapter 32, Section 32.3.4.	EIS Chapter 32, Cumulative Impacts, Section 32.3.4 discusses cumulative marine transportation impacts, including marine construction traffic. The LNG Maritime Movement Scheduling Committee will manage and monitor marine construction traffic travelling from the mainland to Curtis Island to reduce cumulative impacts of this traffic in the harbour.

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
151	The EIS does not adequately address cumulative impacts from dredging carried out for the Arrow LNG Plant at the same time as dredging for adjacent projects against the values as per the EPP (Water). A summary of potential cumulative impacts should be provided.	LNG S018	**EIS** Chapter 32, Section 32.3.5.	EIS Chapter 32, Cumulative Impacts, Section 32.3.5 discusses project dredging activities that could occur concurrently with other dredging activities in Port Curtis. These are limited to Stage 2 of the Western Basin and Dredging and Disposal (WBDD) Project dredging at Laird Point. The dredge management plan for the Arrow LNG Plant will consider the locations and timing of all dredging activities in Port Curtis (project and non-project) and include requirements for water quality monitoring and actions to be taken to minimise the impacts of dredging on sensitive areas should water quality monitoring data show performance criteria are exceeded. Potential cumulative impacts to the marine environment are discussed within this section of the EIS, including information on direct and indirect impacts to marine water quality.
152	The EIS does not adequately address the cumulative impacts of brine water discharge into Port Curtis taking into account other LNG plants on Curtis Island and major harbour dredging programs. Consider and address this matter.	LNG S018	**EIS** Chapter 15, Section 15.3. **SREIS** Chapter 3. Chapter 14, Section 14.6.	A detailed response is provided in Section 4.12 of Chapter 4, Part B of the SREIS.

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
272, 298, 306	The study area for the social and economic impact assessments is not sufficiently large and the LNG industry is affecting a broader region than the Gladstone Regional Council area. Re-evaluate extent of impacts on socio-economic considerations in the Gladstone region to provide a broader overview of regional cumulative impacts. Include representatives of adjacent regional councils in ongoing stakeholder consultation.	LNG S022 LNG S025	**EIS** Chapter 32, Section 32.3.3. Attachment 2. Appendix 20, Chapter 2. **SREIS** Appendix 16.	As discussed in EIS Appendix 20, Social Impact Assessment, (Chapter 2), the Coordinator-General Terms of Reference (TOR) was reviewed to identify the scope of the assessment and a study area. The TOR (EIS Attachment 2) requires a study area to be selected that defines the project's social and cultural area of influence. EIS Chapter 32 Cumulative Impacts (Section 32.3.3) outlines the cumulative impact assessments undertaken as a part of the social and economic impact assessments. These studies have assessed the potential cumulative impacts from a wide spread of projects on services and infrastructure in the Gladstone region, Queensland and more broadly (such as on the Australian economy and domestic gas market).As such, the study area was considered sufficiently wide to identify and address potential social and economic impacts from the project. Arrow Energy has engaged with a range of stakeholders about the project including agencies with jurisdiction across a number of local government areas (SREIS Appendix 16, Supplementary Consultation Report). Arrow Energy is committed to maintaining effective communication with key stakeholders as the project progresses.
328	Consider cumulative impact (short and long term) of LNG Project and other industrial projects in Gladstone, considering air quality, nature conservation, climate change, marine environment and community quality of life.	LNG S026	**EIS** Chapter 32, sections 32.3.3, 32.3.7 and 32.3.5	EIS Chapter 32, Cumulative Impacts, describes the cumulative impact assessments undertaken and the conclusions from these assessments. This includes the findings of the cumulative assessment of air quality impacts (Section 32.3.1) terrestrial and marine ecology impacts (Sections 32.3.7 and 32.3.5 respectively) and social and economic values (including quality of life) (Section 32.3.3).

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
344	Cumulative impact assessment should consider all projects in the vicinity, not be limited to those which had made an investment decision by January 2011. The assessment must include the Tenement to Terminal project.	LNG S026	**EIS** Chapter 32, Section 32.2. **SREIS** Chapter 18. Chapter 19.	The cumulative impact assessment for the Arrow LNG Plant EIS considered the combined effects of all existing developments operating in the Gladstone region, including those under construction, those that have taken a financial investment decision to proceed and projects that have been approved by the Queensland Coordinator-General or have sufficient information in the public domain to enable the potential impacts associated with these projects to be included in the cumulative impact assessment. At the time of writing of the EIS, only the initial advice statement and EPBC Act referral were available for the Tenement to Terminal project; this was insufficient information to accurately assess cumulative impacts. Despite this lack of information, potential cumulative impacts have been considered in the SREIS for terrestrial ecology (Chapter 18) and shorebirds (Chapter 19). The Tenement to Terminal project will be required to consider the Arrow LNG Plant in its assessment of cumulative impacts.
347	No qualitative or quantitative numbers of cumulative shipping or boating numbers have been mentioned. Provide quantitative figures for increased shipping and boating traffic (including LNG tankers and personnel and MOF boat traffic), noise levels from construction and boating and associated dredging for all proposed and current projects known in the Gladstone and Port Curtis area. Assess cumulative impact of project shipping and boats on habitat (loss) for marine species and water quality.	LNG S026	**EIS** Chapter 32, sections 32.3.2, 32.3.4 and 32.3.5. Appendix 12. Appendix 16. **SREIS** Appendix 8, Section 7.3.	EIS Chapter 32, Cumulative Impacts, Section 32.3.4 discusses cumulative impacts of shipping, including cumulative volumes of vessels and marine construction and operations traffic, under the scenario that all proposed projects are approved. EIS Appendix 12, Marine and Estuarine Ecology Impact Assessment, Table 19 provides estimated cumulative frequency of marine vessels. Since the publication and exhibition of the EIS, marine vessel numbers for the project have been revised and are provided in the SREIS Appendix 8, Technical Study of Marine Ecology, Section 7.3, Table 2. The cumulative impact of vessel movements on the marine environment, including marine species habitat and marine water quality is discussed in EIS Chapter 32 of the EIS (Section 32.3.5, Table 32.2). An assessment of cumulative noise levels is provided in EIS Appendix 16, Noise and Vibration Impact Assessment, and discussed in Chapter 32, Section 32.3.2.

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
382	The EIS is not complete with respect to identifying the expected use of local and state road networks in the Gladstone region. The EIS acknowledges this and advises impacts will be assessed in the supplementary EIS. The Coordinator-General should condition the proponent to: (a) provide estimated traffic data for all local roads (in addition to State-controlled roads) in the Gladstone Regional Council area for the Arrow LNG Plant and related projects (Arrow Bowen and Arrow Surat pipeline projects) in the format utilised in traffic data recently sought and obtained from QCLNG, APLNG and GLNG projects. (b) enter into a Road Infrastructure Agreement with Gladstone Regional Council.	LNG S030	**SREIS** Chapter 20, Section 20.5.2. Appendix 13.	Details on the impacts on local and state road networks are included in SREIS Appendix 13, Supplementary Traffic and Transport Impact Assessment, and discussed in SREIS Chapter 20, Traffic and Transport, Section 20.5.2.
428	Cumulative workforce projections in Figure 32.1 and especially Figure 32.3 are based on outdated information. The Coordinator-General should condition the proponent to update these projections for inclusion in the SIMP and Integrated Housing Strategy.	LNG S030	**EIS** Chapter 32, Section 32.3.3. **SREIS** Attachment 4, Section 3.1.	Cumulative workforce projections were based on the most recent data available at the time of writing the EIS and included data sourced from Commonwealth and state government agencies and local government. As discussed in SREIS Attachment 4, SIMP Update, in order to manage and mitigate the identified social impacts and enhance the benefits of the project, a series of action plans have been developed, including a housing and accommodation plan (Section 3.1). These strategies are being developed based on current and available data (at the time) and include consultation with other LNG proponents. Accommodation strategies will be developed in consideration of updated reports from the Office of Economic and Statistical Research.

Table 3.27 Issues register – Chapter 32: Cumulative impacts (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
429	Cumulative impacts of the Arrow LNG Plant with the Arrow Bowen and Arrow Surat pipeline projects should be identified and mitigated by the proponent. The Coordinator-General should condition the proponent to consolidate the impacts of these projects with respect to traffic, housing and other social impact related issues. Cumulative impact analysis and mitigation strategies should be prepared accordingly.	LNG S030	**EIS** Chapter 9. Chapter 32.	A detailed response is provided in Section 4.12 of Chapter 4, Part B of the SREIS.

Table 3.28 Issues register – Chapter 33: Sustainable development

Issue No.	Issue	Submission No.	Response Reference	Comments
1, 6	The EIS assessment does not address the ecological sustainable development (ESD) requirements of the Sustainable Planning Act 2009, which requires consideration of ecological sustainability at local, regional, state and national levels.	LNG S001	**EIS** Chapter 33, Section 33.1.2	The ecologically sustainable development (ESD) requirements of the Sustainable Planning Act 2009 are discussed in the EIS, in Chapter 33, Sustainable Development, Section 33.1.2. The principles of ESD were employed in the assessment approach to the sensitivity and significance of ecological values at local, regional, state and national levels, and were addressed throughout EIS technical reports and chapters.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance

Issue No.	Issue	Submission No.	Response Reference	Comments
67, 291	Further research is recommended on the distribution and extent of relevant species (Irrawaddy dolphin, Snub-fin and Indo-pacific humpback dolphin). Provide further detail on the impacts to these species in Port Curtis in the MNES attachment including on habitat loss, cumulative impacts and proposed mitigation measures (including offsets).	LNG S014 LNG S024	**SREIS** Chapter 15. Appendix 8, sections 4.2.1 and 5.2. Attachment 2, sections 2.2.2 and 4.2.	The spatial and temporal use of the Port Curtis and Calliope River estuary by marine mega fauna has been reviewed using records of opportunistic and targeted observations. Observations and additional assessments are reported in SREIS Chapter 15 Marine Ecology, and Appendix 8, Technical Study of Marine Ecology (Port Curtis). Impacts to dolphins and marine habitats are discussed in the Marine Ecology Technical Study (Port Curtis) completed for the SREIS (Appendix 8, sections 4.2.1 and 5.2), and summarised in SREIS Chapter 15. Section 4.1.2 of Appendix 8 explains the revised field and desktop survey methodology, and impact assessment methodology. This includes locations, dates and methods for aerial and vessel surveys. Section 5.2 of Appendix 8 presents the results of additional survey effort completed to inform the SREIS, as well as the revised assessment of direct and indirect impacts on these species. Accordingly, additional mitigation measures have been developed to manage potential impacts of project activities on marine fauna. Technical study findings are included in SREIS Attachment 2, MNES Update, Section 2.2.2, and Tables 2.2 and 2.3; Section 4.2, and Table 4.1.
162, 287	Provide a map and details of the areas of vegetation proposed to be cleared including for MNES vegetation. Vegetation clearance should be discussed in the context of wilderness, natural beauty or rare and unique environmental values. Provide details of the vegetation management plan, including its purpose and the proposed mitigation measures.	LNG S018 LNG S024	**EIS** Chapter 32, Section 32.3.7. Attachment 4. **SREIS** Chapter 18, sections 18.6, 18.8 and 18.10. Attachment 2, sections 3.1.2 and 3.2.2.	A detailed response is provided in Section 4.13 of Chapter 4, Part B of the SREIS.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
277	MNES chapter must be a standalone document, and while cross-referencing may be provided to specific areas of the EIS, the MNES attachment needs to include survey methodology, information on rationale for determinations of non-significance, assessment of cumulative impacts on MNES, key mitigation measures and offsets for MNES.	LNG S024	**EIS** Attachment 4. **SREIS** Attachment 2.	The MNES attachment (EIS Attachment 4) references information in the EIS to provide background, context and detailed information about survey methods. The MNES attachment included in the SREIS (Attachment 2, MNES Update) addresses changes to the assessment of MNES as a result of project changes, additional information and issues raised in submissions.
278	Further information required in MNES attachment, on methodology used, including limitations and how surveys followed Commonwealth guidelines. Further survey work will need to be undertaken (including targeted surveys if appropriate) unless justification can be provided. Information on the scientific reliability of surveys undertaken and degree of certainty around impacts and mitigation measures required (evidence based analysis for all conclusions, especially conclusions of non-significance).	LNG S024	**SREIS** Chapter 15. Chapter 16. Chapter 17. Chapter 18. Chapter 19. Attachment 2.	Additional field survey work has been undertaken in 2012 relating to MNES and is summarised in Chapters 15 to 19 of the SREIS. SREIS Attachment 2 (MNES Update) summarises the survey and assessment methodology described in the supporting technical studies, particularly; terrestrial ecology, shorebirds, marine ecology, and estuarine ecology. The MNES Update in the SREIS confirms that the survey methodology complies with the EPBC Act Policy Statement 1.1 'Significant Impact Guidelines: Matters of National Environmental Significance' (DEWHA, 2009). The significance assessment approach adopted for the EIS and SREIS is underpinned by management measures that are effective and proven, based on industry standards where relevant. The management measures have been reviewed through FEED to ensure they can be implemented and will be effective in managing identified impacts.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
279	Provide more detail in the MNES attachment regarding indirect impacts and management of these impacts (e.g., activation of ASS in relation to MNES). The EIS should account for indirect impacts when coming to a conclusion on MNES.	LNG S024	**EIS** Appendix 4. **SREIS** Chapter 12.	Technical studies informing the SREIS chapters (Terrestrial Ecology; Shorebirds; Marine Ecology; Calliope River Estuarine Ecology) all review and assess potential indirect impacts. For example, EIS Appendix 4, Acid Sulfate Soil Impact Assessment, provides a comprehensive assessment of acid sulfate soils expected to be encountered in the project area and proposes measures to effectively manage these soils during disturbance, handling and disposal. The study concludes that "…ASS disturbances in the Gladstone area have not and are not likely to cause significant environmental harm as disturbances are managed or planned to be managed in accordance with SPP 2/02 and its attendant guidelines and reference documents." Further information on ASS in the project area has been obtained from a geotechnical investigation being carried out in project areas. The program has included analysis for ASS/PASS. Preliminary results of this investigation for marine sediments at the dredge sites are included in SREIS Chapter 12, Sediment Characterisation. This information and the final results of the investigation will inform the development of the ASS management plan.
280	Provide further information and justification for use of separate gas pipeline rather than Northern Infrastructure Corridor precinct of the GSDA, particularly in relation to impacts on MNES. Note that the Northern Infrastructure Corridor has already been approved and a number of impacts to MNES addressed in previous approvals.	LNG S024	**EIS** Chapter 5, Section 5.3.4.	EIS Chapter 5, Assessment of Alternatives, Section 5.3.4 provides the rationale for a separate gas pipeline to the mainland, rather than using the Northern Infrastructure Corridor Sub-Precinct of the GSDA. The reasons include proximity to the Arrow Surat Gas Pipeline, misalignment with the construction schedules of the other projects, avoidance of significant environmental and cultural heritage management issues, and avoidance of conflicts with future infrastructure.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
281	Information on the indicative frequency of all maritime vessel types (dredging, shipping, transport of goods and materials) is required in MNES attachment.	LNG S024	**SREIS** Chapter 7, sections 7.1.1 and 7.2.1. Chapter 15, Section 15.6.2. Appendix 13.	Technical studies informing the SREIS have assessed revised projections of vessel movements with respect to marine logistics and transport. Estimated vessel movements during construction and operations are described in SREIS Chapter 7, Project Description: Logistics (Section 7.1.1 and Section 7.2.1 respectively). Additional details on ferry movements are included in the Transport and Traffic Technical Study completed for the SREIS, Appendix13, Chapter 5, Section 5.5. Impacts of vessel movements on marine fauna are addressed in SREIS Chapter 15 Marine Ecology Section 15.6.2.
282	Further detail required in MNES attachment around vegetation communities, habitat type and use with the Great Barrier Reef World Heritage Area (GBRWHA). Maps of important habitat for key species (seagrass for dugongs) and other values in relation to project infrastructure would be useful, including any within the area of 10m salinity discharge. Vegetation clearance should be discussed in the context of wilderness, natural beauty or rare or unique environment values.	LNG S024	**SREIS** Attachment 2, sections 2.1 and 2.2. Chapter 16. Chapter 19. **EIS** Chapter 19.	A detailed response is provided in Section 4.13 of Chapter 4, Part B of the SREIS.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
284	MNES attachment presents a reasonable summary of the anticipated impacts on Great Barrier Reef World Heritage Area (GBRWHA) and Natural Heritage values and provides mitigation measures based on legislation and industry standards. However, for those impacts that cannot be fully mitigated (associated with habitat loss, dredging, dredge spoil disposal and loss of visual amenity) further information around offsetting is required (the offsets plan, or at a minimum, more detail around offsetting) including: • what specific components of the project will impact upon Great Barrier Reef World Heritage Area (GBRWHA) values; • impacts from dredging and dredge spoil disposal; • aesthetic impacts; • quantification of impacts (direct and indirect; vegetation clearance placed in regional context); • assessment of cumulative impacts; • effectiveness of mitigation measures; • assessment of residual impacts; and • details around proposed management plans.	LNG S024	**SREIS** Chapter 16. Chapter 17. Chapter 18, Section 18.6. Attachment 2, Chapters 2 and 3. Attachment 6	Further assessment of impacts on the GBRWHA and Natural Heritage values is provided in SREIS Attachment 2, MNES Update, Chapter 2 and is based on additional technical studies completed for the SREIS. Table 2.2 of SREIS Attachment 2, correlates specific project components and potential impacts to the Great Barrier Reef World Heritage and Natural Heritage values. The potential direct and indirect impacts of dredging on marine fauna and habitats are addressed in SREIS Chapters, 16 Marine Ecology, and Chapter 17, Estuarine Ecology (Calliope River), and their associated technical studies. SREIS Chapter 18, Terrestrial Ecology, Section 18.6 provides a revised floristic assessment of terrestrial vegetation. Section 18.6.2 addresses EPBC listed threatened ecological communities and s.18.6.4 addresses EPBC listed flora species. Chapter 18, Table 18.3 tabulates the revised areas of regulated vegetation to be cleared within the project area. This information is summarised in SREIS Attachment 2 (MNES Update) sections 3.1.2 & 3.2.2, and Tables 3.1 and 3.2. The MNES Attachments to the EIS and the SREIS include commitments to address potential impacts to EPBC listed species. Arrow Energy has developed a Draft Environmental Offset Strategic Management Plan (Attachment 6 of the SREIS) to ensure that Arrow Energy's operations are conducted at, or above, the legal requirements and standards expected by stakeholders and the broader community. The strategy has been informed by the current Queensland and Australian government's regulatory framework for environmental offsets. SREIS Attachment 6 identifies Arrow Energy's likely offset requirements and how these offsets are likely to be achieved, and will be used to inform these project specific management plans.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
285	Detail required in MNES attachment on how project dredging will be integrated with WBDDP dredging, and the cumulative impacts associated with dredging.	LNG S024	**EIS** Chapters 15, 16 and 19 **SREIS** Attachment 2.	The modelling of impacts of dredging on coastal processes and water quality carried out for the EIS included the WBDD project and other relevant developments in Port Curtis in the base case. The modelling results were used in the assessment of cumulative impacts for coastal processes, water quality and marine and estuarine ecology (EIS chapters 15, 16 and 19). The conclusions of these studies has been reviewed for the SREIS in light of changes to project dredging activities and considered in the MNES Update in SREIS Attachment 2. The dredge management plan for the Arrow LNG Plant will consider the locations and timing of all dredging activities in Port Curtis (project and non-project).
286	Provide a more detailed rationale in MNES attachment for the conclusion that there will be no residual significant impact on landscape and visual receptors from lighting during construction, given that the EIS states that lighting will have a significant impact on landscape and visual receptors.	LNG S024	**EIS** Chapter 23, sections 23.4.2 and 23.8. Chapter 32. Attachment 4, Section 6.5.2 **SREIS** Chapter 16.	A detailed response is provided in Section 4.13 of Chapter 4, Part B of the SREIS.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
288	Further detail of MNES protected species is required around: • status of each species (vulnerable, endangered, etc.) and scientific name of each species. • use of diagrams and illustrations to show proximity of species/habitat (potential/known/type) in relation to project infrastructure. • assessment of impacts on all listed threatened species or communities likely to occur or be impacted by the proposed action. • detail around methodologies used. • assessment of residual impacts. • details around proposed mitigation measures and management plans. • detail around pre-clearance surveys to demonstrate avoidance and mitigation measures will be effective. The timing of pre-clearance surveys is crucial (especially shorebirds). • proposed offsets (what will be offset and how will it be implemented/managed). For those species considered not likely to be impacted by the proposed action, a clear rationale of why no impact is likely is required to be presented.	LNG S024	**EIS** Attachment 4 **SREIS** Chapter 3 Chapter 18. Attachment 2, Chapter 3. Attachment 5 Attachment 6. Appendix 8. Appendix 11. Appendix 12.	A detailed response is provided in Section 4.13 of Chapter 4, Part B of the SREIS.

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
289	Further detail of MNES migratory species is required around: • use of diagrams and illustrations to show proximity of species/habitat (potential/known/type, e.g., white-bellied sea-eagle nest) in relation to project infrastructure; • assessment of impacts on all listed threatened species or communities likely to occur or be impacted by the proposed action; • detail around methodologies used; • assessment of residual impacts; • details around proposed mitigation measures and management plans; • detail around pre-clearance surveys to demonstrate avoidance and mitigation measures will be effective. The timing of pre-clearance surveys is crucial (especially shorebirds); and • proposed offsets (what will be offset and how will it be implemented/managed).	LNG S024	**EIS** Attachment 4 **SREIS** Chapter 15, Section 15.4.2. Chapter 19. Attachment 2, Chapter 4. Attachment 5. Attachment 6 Appendix 8. Appendix 11. Appendix 12.	A detailed response is provided in Section 4.13 of Chapter 4, Part B of the SREIS.
290	Migratory shorebird surveys undertaken as a condition of the WBDDP indicate intertidal areas within the footprint of the proposed action as feeding habitat for migratory shorebirds, and two roost sites were identified in proximity to launch site 1. The presence of shorebird feeding and roosting habitat needs to be clarified.	LNG S024	**SREIS** Chapter 19 Attachment 2, chapters 2 to 5. Appendix 12.	The SREIS Interim Shorebirds Technical Study report (Appendix 12) identifies the location the two roost sites and provides details for 21 habitat sites, including launch site 1 (Figure 3). The findings of the study are summarised in the SREIS in Chapter 19, Shorebirds. The SREIS Attachment 2, MNES draws in the technical study in the discussion of MNES (chapters 2 to 5).

Table 3.29 Issues register – Attachment 4: Matters of national environmental significance (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
292	Provide information on proposed offsets, including what the offsets compensate for and how the offsets comply with guidelines and policies. The offset strategy must specifically address MNES. The Australian Government preference is for the strategy to align with the offsets required for the three approved LNG plants on Curtis Island.	LNG S024	**SREIS** Attachment 2, Chapters 2 to 5. Attachment 6.	A detailed response is provided in Section 4.13 of Chapter 4, Part B of the SREIS.
293	Commitment language must be used for mitigation measures, and the level of impact must be appropriately mitigated. The expected cost and approving agency for each mitigation measure is also required.	LNG S024	**EIS** Chapter 2. Attachment 1. Attachment 4. **SREIS** Attachment 1. Attachment 2.	The mitigation measures presented in the EIS and the MNES Attachment 4 are presented as commitments. SREIS Attachment 2, MNES Update, Appendix C provides the project commitments relating to the protection and management of MNES. The framework for project approvals is provided in EIS Chapter 2, Project Approvals, and Attachment 1, Relevant Legislation, Policies and Approvals; and has been updated for the SREIS (Attachment 1, Approvals Update). The cost of mitigation will be determined through a competitive tendering process for the construction of the Arrow LNG Plant. Consequently, it is not possible to provide details of the costs of mitigation. All mitigation measures have been reviewed by Arrow Energy for technical feasibility and cost to ensure they can be implemented.
294	More information is required in the MNES on the circumstances around the two Penalty Infringement Notices noted in the EIS.	LNG S024	**EIS** Chapter 1.	EIS Chapter 1, Introduction discusses the penalty infringement notices (PINs).

Table 3.30 Issues register – Attachment 6: Environmental management plan

Issue No.	Issue	Submission No.	Response Reference	Comments
185	EMP – The draft EMP provided in the EIS references both the LNG facility and the feed gas pipeline. Provide two draft EMPs, one for the petroleum facility license and another for the petroleum pipeline license to accompany the environmental authority applications for each tenure.	LNG S018	**EIS** Attachment 6. **SREIS** Attachment 3.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.
186	EMP – Existing or proposed notifiable activities have not been clearly listed in the draft EMP. Section 1 of the draft EMP should be revised to list the number and name of all existing and proposed notifiable activities on each project site.	LNG S018	**EIS** Attachment 6, Section 4.3.1. **SREIS** Attachment 3.	The single existing notifiable activity of a 'cattle dip' is listed in Section 4.3.1 of the EMP. Details of proposed notifiable activities be available after the completion of detailed engineering design which is yet to be completed. These will be included with the statutory EM Plans that will accompany the environmental authority application for the project. Environmentally relevant activities anticipated to be applicable to the project, and providing an indication of notifiable activities are presented in Table 1.2 of the Strategic EMP presented as SREIS Attachment 3.
187	EMP – ERAs have been listed in the EMP but associated thresholds are not specified. Revise the draft EMP to include ERA thresholds as specified in the Environmental Protection Regulation 2008.	LNG S018	–	Details of proposed ERA thresholds will be included with the statutory EM Plans that will accompany the environmental authority applications for the project.
188	EMP – The total financial assurance amount has not been specified in the EMP. Section 310D (4) of the EP Act requires a rehabilitation program as part of the EMP to state a proposed amount of financial assurance for the environmental authority. Specify the required financial assurance in Section 1.8 of the EM Plan, including assumptions used. Show financial assurance for each the petroleum facility license and the petroleum pipeline license.	LNG S018	–	The total financial assurance amount will be included with the statutory EM Plans that will accompany the environmental authority applications for the project.

Table 3.30 Issues register – Attachment 6: Environmental management plan (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
189	EMP - The maximum disturbance area has not been specified in the EMP. Include the maximum disturbance areas in hectares for the LNG Plant, marine facilities and workers accommodation.	LNG S018	**SREIS** Attachment 3	At the time of publication of the SREIS, the total area of disturbance of the project is 533.7 ha. The final area of disturbance details will be confirmed following completion of detailed design of the project and will be included with the statutory EM Plan that will accompany the environmental authority application for the project. The total area of disturbance is presented in Table 4.8 within Section 4.8.1 of the Strategic EMP presented as SREIS Attachment 3.
190	EMP - Greater detail is required over the length of each section of the pipeline and potential impacts to environmental values and associated mitigation measures (refer to submission for detailed information requirements).	LNG S018	–	Specific details relating to infrastructure design will be available after the completion of detailed engineering design and will be included in the statutory EM Plans that will accompany the environmental authority applications for the project.
191	EMP - Various implementation strategies in the draft EMP do not provide adequate information on when, how and where each strategy will be used. Terms such as 'where practical' and 'where alternatives are not available' are not suitable for use in this plan, and replaced with quantifiable, objective commitments. If precise timing is unknown, provide indicative timeframes such as the minimum or maximum timeframes before work will be conducted.	LNG S018	–	Specific details of proposed implementation strategies will be included with the statutory EM Plan that will accompany the environmental authority application for the project. Some specific details may not be available until after the completion of detailed engineering design to be completed by the Engineering Procurement and Construction (EPC) contractor. It is likely that the EPC phase will design out much of the current optionality that is being carried forward.

Table 3.30 Issues register – Attachment 6: Environmental management plan (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
192	EMP - Impacts such as groundwater dewatering presenting a risk to personnel, and dewatering leading to reduced aquifer recharge are not addressed adequately by mitigation in the EMP. Provide further information on groundwater dewatering, management of contaminants, and groundwater monitoring bores (refer to submission for detailed information requirements).	LNG S018	**EIS** Chapter 14, Section 14.4 Attachment 6. Appendix 7. **SREIS** Attachment 5.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.
193	EMP - The EMP does not clearly indicate the extent of dredge areas. Provide a map that clearly shows the extent of dredging outside the WBDDP area. Provide evidenced based assessment of environmental values present, potential impacts (including to water quality) and mitigation measures.	LNG S018	**EIS** Chapter 15. Chapter 16 Chapter 19. **SREIS** Chapter 6 Chapter 13. Chapter 14. Chapter 15. Chapter 17. Attachment 3.	The revised extent of dredge areas is shown in SREIS Chapter 6, Project Description: Dredging, Figures 6.1 to 6.5. Impacts on environmental values at dredge sites in Port Curtis and the Calliope River were assessed in detail in the studies completed for the EIS and summarised in Chapter 15, Coastal Processes, Chapter 16, Marine Water Quality and Sediment and Chapter 19, Marine and Estuarine Ecology. These assessments have been reviewed in light of changes to the layout and design of some of the dredge sites and are discussed in SREIS Chapter 13, Marine Water Quality, Chapter 14, Coastal Processes, Chapter 15, Marine Ecology and Chapter 17, Estuarine Ecology (Calliope River). The Strategic EMP has been updated accordingly and is included in SREIS Attachment 3. Further detail will be included as required with the statutory EM Plans that will accompany the environmental authority applications for the project.
194	EMP - The EMP provides insufficient detail of where storm water, hydrostatic test water, brine, dewatering of tunnel spoil, treated sewage effluent and process water will be disposed, and how disposal will be managed. Provide evidence-based assessment for each contaminant for each release point (refer to submission for detailed information requirements).	LNG S018	**EIS** Chapter 31. Appendix 29. **SREIS** Chapter 4, Section 4.10. Attachment 3, Section 4.22.2.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.

Table 3.30 Issues register – Attachment 6: Environmental management plan (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
195	EMP - The EMP outlines potential erosion and sedimentation impacts and associated control measures, but not in sufficient detail. The plan should include an erosion and sediment control plan that meets the Best Practice Erosion and Sediment Control guidelines (International Erosion Control Association, 2008) (refer to submission for detailed information requirements).	LNG S018	**EIS** Chapter 13, Section 13.5	The EIS contains several commitments to implement measures to manage erosion and sedimentation impacts (EIS Chapter 13, Surface Water Hydrology and Water Quality, Section 13.5). These include the development of a site drainage plan, specific erosion and sediment control measures, and management of surface runoff and stream channel erosion. These commitments are carried forward into the Strategic EMP presented as SREIS Attachment 3. Further details on erosion and sedimentation control measures will be developed through detailed engineering design that has yet to be completed by an EPC contractor. Full details will be included in the statutory EM Plans that will accompany the environmental authority applications for the project.
196	EMP - Advise whether underground storage tanks will be required within the petroleum facility license or petroleum pipeline license areas. Details of the tanks should be provided including leak detection and integrity testing methods.	LNG S018	–	At this time, no underground storage tanks will be required on the LNG plant site or at mainland facilities. Detailed engineering design will determine the need for such facilities. If required, the details of the tanks (number, location, volume, contents, inventory control, leak detection and monitoring requirements) will be provided in the statutory EM Plans that are prepared in support environmental authority applications. Any underground storage tanks that are required for hydrocarbon products will be designed, installed and operated in accordance with AS1940.
197	EMP - Clarify whether brine will be generated by the reverse osmosis or desalination plant. Ensure consistent use of terminology in the EMP as both reverse osmosis plant and desalination plant are used. Detail the quantity of brine and how it will be stored, including capacity/design of any storage ponds.	LNG S018	**SREIS** Chapter 4, Section4.9.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.

Table 3.30 Issues register – Attachment 6: Environmental management plan (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
198	EMP - It is difficult to see the extent of environmentally sensitive areas on Figure 7 of the EMP as it is at a large scale. It is also unclear whether Endangered Regional Ecosystems (ground truthed) vary from State Regional Ecosystem mapping. Provide further information on the ESAs present on the proposed petroleum facility license or petroleum pipeline license sites. Information may be arranged in tabular form.	LNG S018	**EIS** Attachment 3, Section 4.8.	A list of regional ecosystems to be cleared and estimated areas of clearance has been included in SREIS Attachment 3, Strategic EMP, Section 4.8. Figure 7 has been updated and more clearly delineates environmentally sensitive areas.
199	EMP - The EMP does not list the regional ecosystem types of vegetation to be cleared. Provide a list of regional ecosystems present and total area (in hectares) of each regional ecosystem proposed to be cleared. Information may be in tabular form.	LNG S018	**SREIS** Attachment 3, Section 4.8.	A list of regional ecosystems to be cleared and estimated areas has been included in the SREIS in Section 4.8 of the Strategic EMP (Attachment 3).
200	EMP - The EMP does not include details on vegetation clearing, including timing/method/rehabilitation. Provide details of no-go zones; pre-clearance surveys to be undertaken; and the retained wildlife corridor on Boatshed Point. Detail how surveys will be conducted for terrestrial and marine species.	LNG S018	**SREIS** Attachment 5.	Information on vegetation clearing, pre-clearance surveys and the retained wildlife corridor on Boatshed Point are detailed in the draft management plans included in SREIS Attachment 5, Other Management Plans. Final management plans will be included with the statutory EM Plans that will accompany the environmental authority applications for the project.
201	EMP - The EMP outlines maximum greenhouse gas emissions but does not include start-up flaring or provide detail on the emissions expected at various stages of the project, or the implementation strategy to reduce emissions. Include further detail and include commitments for continual improvement and best practice strategies for reducing emissions.	LNG S018	**SREIS** Chapter 10. Appendix 3.	The greenhouse gas emissions of the project were reassessed for the SREIS. The greenhouse gas emissions and the profile of emissions is discussed in SREIS Chapter 10, Greenhouse Gas; and presented in Appendix 3, Greenhouse Gas Impact Assessment.

Table 3.30 Issues register – Attachment 6: Environmental management plan (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
202	EMP - The EMP does not provide background air quality monitoring data, or detail regarding the proximity of sensitive receptors or modelling of the expected air quality from the project. Revise the EMP with reference to the detailed information requirements set out in the submission.	LNG S018	**EIS** Chapter 21. Appendix 14 **SREIS** Chapter 8. Appendix 1. Attachment 3.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.
203	EMP - The EMP does not provide a locality map showing monitoring sites. It is unclear if any of the assessment points refer to sensitive receptor locations. There is no outdoor noise criterion for day and evening in the plan for the construction phase of the project. No detail has been provided on the expected air overblast pressure and/or ground borne vibration. Revise the EMP with reference to the detailed information requirements set out in the submission.	LNG S018	**SREIS** Chapter 11. Attachment 3. Appendix 4.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.
204	EMP - The EMP does not provide adequate detail on the expected quantity and type of waste to be generated on the petroleum facility license or petroleum pipeline license areas. Revise the EMP with reference to the detailed information requirements set out in the submission.	LNG S018	**EIS** Chapter 31. Appendix 29. **SREIS** Attachment 3, Section 4.22.2.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.

Table 3.30 Issues register – Attachment 6: Environmental management plan (cont'd)

Issue No.	Issue	Submission No.	Response Reference	Comments
205	EMP - No information is provided in the EMP regarding the quality or quantity of wastewater to be disposed to land or reused on site, or the characteristics of the receiving site and proposed reuses. Revise the EMP with reference to the detailed information requirements set out in the submission.	LNG S018	**EIS** Chapter 6, Section 6.4.3. Chapter 31. **SREIS** Chapter 4, Section 4.10. Attachment 3, Chapter 4, Section 4.22.2.	A detailed response is provided in Section 4.14 of Chapter 4, Part B of the SREIS.
206	EMP - The EMP does not provide detail on the maximum timeframe for rehabilitation and how long disturbed areas may remain exposed. The frequency of monitoring is not provided, nor are the criteria the rehabilitated site will need to meet to be deemed successfully rehabilitated. Revise the EMP with reference to the detailed information requirements set out in the submission.	LNG S018	–	A rehabilitation plan will be completed prior to construction works commencing. The plan will provide details and timeframes for rehabilitation activities, including target criteria and monitoring programs. These details will be included in the statutory EM Plans to be submitted in support applications for environmental authorities for the project. Arrow Energy will develop landscape and rehabilitation plans for all project sites, particularly the selected TWAF site, which will require remediation after the first construction phase (Commitment 23.14).