

## 13.0 SUMMARY OF ASSESSMENT OF POTENTIAL IMPACTS TO MATTERS OF NES

This PER and associated appendices make reference to both the Approved Gorgon Gas Development and the Revised Gorgon Gas Development, which is the subject of this PER. For clarification purposes, the following definitions are provided:

- ◆ “the Approved Gorgon Gas Development” or “the Approved Development” refers to the development proposed in the EIS/ERMP (Chevron Australia 2005a) and subsequently approved under Statement No. 748 and EPBC Reference: 2003/1294
- ◆ “the Gorgon Gas Development Revised and Expanded Proposal” or “the Revised Gorgon Gas Development” or “the Revised Proposal” refers to the development proposed in this PER, which is yet to gain approval
- ◆ “the Gorgon Gas Development” refers to the entire proposal. This descriptor may be used when the reference is being made to elements of “the Revised Proposal” described in the PER when they replace the elements of “the Approved Development” which have changed to create the final product as proposed in this PER.

### 13.1 Introduction

Matters protected by the Commonwealth EPBC Act are known as matters of National Environmental Significance (NES) and include:

- ◆ World and National Heritage Places
- ◆ Wetlands of International Importance
- ◆ Listed threatened species
- ◆ Listed migratory species
- ◆ Nuclear actions
- ◆ Commonwealth Marine Area.

Under the Commonwealth EPBC Act, the Revised Proposal (as described in Section 3.0) was considered to be a ‘controlled action’, requiring assessment, due to the following controlling provisions:

- ◆ listed threatened species and communities (sections 18 and 18A)
- ◆ listed migratory species (sections 20 and 20A).

### 13.2 Matters of NES Relevant to the Revised Proposal

A total of 30 terrestrial and marine threatened and/or migratory species listed under the Commonwealth EPBC Act could potentially occur within the areas affected by the Revised Proposal and the Approved Development. This includes one species of stygofauna, *Milyeringa veritas* (blind gudgeon). No vegetation associations or flora species which are listed under the Commonwealth EPBC Act have been recorded within areas affected by the Gorgon Gas Development (including those affected by the Revised Proposal).

#### 13.2.1 Listed Threatened Species

Results of a search of the EPBC Act Protected Matters Interactive Search Tool indicated that a total of 16 threatened fauna species listed under the Commonwealth EPBC Act as Endangered or Vulnerable could potentially occur within the areas affected by the

Revised Proposal and the Approved Development (Table 13.1). The threatened fauna included terrestrial and marine species, some of which are also protected by the Commonwealth EPBC Act as migratory species.

### **13.2.2 Listed Migratory Species**

Results of a search of the EPBC Act Protected Matters Interactive Search Tool indicated that 23 migratory fauna species listed under the Commonwealth EPBC Act could potentially occur in the areas affected by the Revised Proposal and the Approved Development (Table 13.1). This included migratory terrestrial, wetland and marine species and migratory marine birds. Some of these species are also listed as threatened species under the Commonwealth EPBC Act.

### **13.3 Potential Sources of Impact to Matters of NES**

Potential sources of impact to terrestrial, subterranean and marine fauna were identified in Section 6.1, Section 6.2 and Section 7.1 respectively. In summary, the key potential sources of impact to matters of NES from the Revised Proposal include:

- ◆ Additional utilisation of approximately 40 ha of the available 300 ha over and above the initial land use estimate for the Approved Development. The long-term land disturbance associated with the Revised Proposal (above that associated with the Approved Development) will decrease the area of available habitat (terrestrial and subterranean) and may increase the potential for loss or displacement of individual fauna.
- ◆ Accelerated rate of reservoir CO<sub>2</sub> injection into the Dupuy Formation when compared with the Approved Development. While total volumes of CO<sub>2</sub> to be injection remain unchanged, unplanned CO<sub>2</sub> release to the surface or near-surface environment from unplanned migration of CO<sub>2</sub> from deep faults could potentially lead to a localised anoxic environment for stygofauna in the superficial aquifer.
- ◆ Additional direct seabed disturbance associated with the proposed reconfiguration of the Approved Development causeway and MOF under the Revised Proposal. The Revised Proposal causeway and MOF will result in a minor increase in the area of the seabed permanently covered by marine infrastructure, noting that some of this additional area would have been subject to disturbance from the LNG Jetty (as part of the Approved Development).
- ◆ Physical presence of infrastructure of increased length resulting in disturbance to marine fauna behaviour patterns and a potential increase in predation of marine turtles.
- ◆ Increased light emissions (mainly associated with the operational phase of the Gorgon Gas Development) associated with the lighting requirements for the additional terrestrial infrastructure may affect both terrestrial and marine fauna behaviour.
- ◆ Increased LNG and condensate tanker movements under the Revised Proposal may have some level of additional impact to individual marine species on the east coast of Barrow Island (i.e. vessel strike).

### **13.4 Assessment of Potential Impacts to Matters of NES**

Refer to Table 13.1 for a summary of impacts to matters of NES as taken from Sections 6.1, 6.2 and 7.1 of the PER.

**Table 13.1: Summary of Assessment of Potential Impacts to Matters of NES**

Species and EPBC Act Status	Occurrence on Barrow Island or in the waters Around Barrow Island	Key Potential Impacts Arising from the Revised Proposal	Significance of Potential Impact	Section Addressed in PER
<p><i>Balaenoptera musculus</i> (blue whale) Threatened Migratory</p>	<p>Migratory species which is not likely to visit the shallow, turbid inshore waters in the vicinity of the east coast facilities that are the subject of the Revised Proposal; likely to be more abundant in offshore, deeper waters.</p>	<p>Vessel collision – the Revised Proposal will result in an increased number of LNG and condensate tanker movements.</p>	<p>The Revised Proposal is considered to present an unchanged risk and is unlikely to have a significant additional impact to this species primarily because there is a low likelihood of vessel strikes. If vessel strike was to occur, the event would have effects at the individual level only (rather than species or population level). Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p>	<p>Section 7.1</p>
<p><i>Megaptera novaeangliae</i> (humpback whale) Migratory</p>	<p>Humpback whales pass through the Montebello/ Lowendal/Barrow Island region between June and October on their annual migration. Humpback whales are more common in waters west of Barrow Island and may occasionally occur in the offshore, deeper waters off the east coast.</p>	<p>As above.</p>	<p>As above.</p>	<p>Section 7.1</p>
<p><i>Balaenoptera edenia</i> (Byrde's whale) Migratory</p>	<p>Known to occur off the north Western Australian coast; may occasionally occur in the waters around Barrow Island</p>	<p>As above.</p>	<p>As above.</p>	<p>Section 7.1</p>
<p><i>Orcinus orca</i> (killer whale) Migratory</p>	<p>Are known in the area from sightings; are likely to be occasional visitors.</p>	<p>As above.</p>	<p>As above.</p>	<p>Section 7.1</p>
<p><i>Sousa chinensis</i> (Indo-Pacific humpback dolphin) Migratory</p>	<p>Have resident populations within the shallow waters of the inner Rowley Shelf, including Barrow Island. The regional distribution of most dolphin species is poorly known and while many species may occur in the Pilbara region, most are likely to be only transients or occasional visitors to the waters around Barrow Island.</p>	<p>As above.</p>	<p>As above.</p>	<p>Section 7.1</p>
<p><i>Tursiops aduncus</i> (spotted bottlenose)</p>	<p>Are expected to occasionally visit all subtidal marine areas of the Revised Proposal. The regional distribution of most</p>	<p>As above.</p>	<p>As above.</p>	<p>Section 7.1</p>

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dolphin) Migratory	dolphin species is poorly known and while many species may occur in the Pilbara region, most are likely to be transients or occasional visitors.		As above.	Section 7.1
<i>Rhinocodon typus</i> (whale shark) Threatened Migratory	Expected to be occasional visitors to either side of Barrow Island.	As above.	As above.	Section 7.1
<i>Dugong dugon</i> (dugong) Migratory	Dugong are generally associated with shallow seagrass meadows and are likely to be occasional visitors to the subtidal seagrass on the east coast of Barrow Island. However, there are no known major seagrass meadows along the east coast of Barrow Island that are likely to be critical feeding habitats for dugong.	As above	The Revised Proposal is considered to present an unchanged risk and is unlikely to have a significant additional impact to this species as dugong have not been observed in high numbers in the waters surrounding Barrow Island. Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development	Section 7.1
<i>Caretta caretta</i> (loggerhead turtle) Threatened Migratory	Have been observed in the waters around Barrow Island and occasional nesting has occurred on Barrow Island beaches.	Light emissions – the Revised Proposal will result in further lighting from additional infrastructure and tankers. Vessel collision – the Revised Proposal will result in an increased number of LNG and condensate tanker movements.	The Revised Proposal is considered to present an unchanged risk and is unlikely to have a significant additional impact to this species as: <ul style="list-style-type: none"> <li>◆ the impacts to marine fauna from light spill are not expected to extend further or affect new areas that were not identified as being affected by the Approved Development</li> <li>◆ light spill from the Revised Proposal Gas Treatment Plant (as modelled) was comparable to illumination levels on clear nights with full or quarter moon. It also needs to be noted that some shielding effects will be provided by the sand dune at Bivalve Beach and additional large structures on the plant, which have not been accounted for in the model (i.e. the model has been projected on a flat plane).</li> <li>◆ the likelihood of vessel strike to this species is not anticipated to significantly increase above that assessed for the Approved Development; although there</li> </ul>	Section 7.1

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<i>Eratmochelys imbricate</i> (hawksbill turtle) Threatened Migratory	Barrow Island is not a regionally important nesting site; these turtles nest at low densities around the Island.	As above.	Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development	Section 7.1
<i>Dermochelys coriacea</i> (leathery or leatherback turtle) Threatened Migratory	Uncommon but expected to be regular visitors to the region; not known to nest in Western Australian waters.	As above.	The Revised Proposal is considered to present an unchanged risk and is unlikely to have a significant additional impact to this species primarily because species is uncommon in the region (and not known to nest in Western Australian waters). If species was present, potential impacts (if any) would be expected to be at the individual level rather than the species or population level. Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development	Section 7.1
<i>Natator depressus</i> (flatback turtle) Threatened Migratory	Nest in high numbers on east coast beaches of Barrow Island and they feed in offshore waters. Post-hatchlings and juveniles may occur in shallow near-shore waters around the island.	Light emissions – the Revised Proposal will result in further lighting from additional infrastructure and tankers. Physical barrier created by marine solid causeway and MOF – the Revised Proposal will result in an increase in length of solid causeway. Vessel collision – the Revised Proposal will result in an increased number of LNG and condensate tanker movements.	The Revised Proposal is considered to present an unchanged risk and is unlikely to have a significant additional impact to this species as: <ul style="list-style-type: none"> <li>◆ the significant distance of the MOF and LNG Jetty from the beach will allow hatchlings to disperse well in the water and will diminish the effect of the additional light sources on the turtles</li> <li>◆ The potential impact to behaviour and potential increase in predation resulting from the increased length of the solid</li> </ul>	Section 7.1

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<p><i>Chelonia mydas</i> (green turtle) Threatened Migratory</p>	<p>Barrow Island is a regionally important nesting area for green turtles. They nest predominantly on the west coast beaches and also mate close to Barrow Island during the summer breeding season and forage very close to shore year round (east and west coast).</p>	<p>As above.</p>	<p>causeway/MOF are not anticipated to result in significant impacts to flatback turtles.</p> <ul style="list-style-type: none"> <li>◆ the impacts to marine turtles from light spill are not expected to extend further or affect new areas that were not identified as being affected by the Approved Development</li> <li>◆ light spill from the Revised Proposal (as modelled) was comparable to illumination levels on clear nights with full or quarter moon. It also needs to be noted that some shielding effects will be provided by the sand dune at Bivalve Beach and additional large structures on the plant, which have not been accounted for in the model (i.e. the model has been projected on a flat plane)</li> <li>◆ the likelihood of vessel strike to this species is not anticipated to significantly increase above that assessed for the Approved Development; although there will be additional vessel movements, most vessels will be slow moving, displacement type vessels. If vessel strike was to occur, the event would have affects at the individual level only (rather than species or population level).</li> </ul> <p>Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p>	<p>Section 7.1</p>
<p><i>Bettongia lesueur</i> unnamed subsp.</p>	<p>Boodie warrens are widely distributed on Barrow Island, generally in upland areas</p>	<p>Loss of an additional area of potential foraging habitat. There are</p>	<p>The Revised Proposal is considered to present an unchanged risk to this species</p>	<p>Section 6.1</p>

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(boodie) Threatened	of limestone cap rock. There are no additional active warrens (in addition to the one active warren within the disturbance area of the Approved Development) within the disturbance area of the Revised Proposal.	no additional active warrens within the disturbance area of the Revised Proposal.	and is unlikely to have a significant additional impact to this species as: <ul style="list-style-type: none"> <li>◆ no additional active warrens will be disturbed by the Revised Proposal (based on current survey data, July 2008)</li> <li>◆ warrens are widely distributed across Barrow Island</li> <li>◆ species not restricted to the area described by the Revised Proposal.</li> </ul> Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development	Section 6.1
<i>Isodon auratus barrowensis</i> (golden bandicoot) Threatened	Widespread and abundant throughout their range on Barrow Island, being the most abundant mammal on Barrow Island.	Loss of an additional area of potential habitat from the Revised Proposal.	The Revised Proposal is considered to have an unchanged risk to this species and is unlikely to have a significant additional impact to this species as: <ul style="list-style-type: none"> <li>◆ species not restricted to the area described by the Revised Proposal</li> <li>◆ highly mobile species and able to move away from areas of disturbance</li> <li>◆ Revised Proposal requires a small increase in total clearing (but within the 300 ha available on Barrow Island for gas processing activities under the <i>Barrow Island Act 2003</i> (WA)); however habitats are well represented outside the area of disturbance.</li> </ul> Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development	Section 6.1
<i>Lagorchestes conspicillatus conspicillatus</i> (spectacled hare-wallaby) Threatened	Widespread on Barrow Island.	Loss of an additional area of potential habitat as a result of the Revised Proposal.	The Revised Proposal is considered to have an unchanged risk to this species and is unlikely to have a significant additional impact to this species as: <ul style="list-style-type: none"> <li>◆ species not restricted to the area described by the Revised Proposal</li> <li>◆ highly mobile species and able to move</li> </ul>	Section 6.1

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<p><i>Petrogale lateralis</i> <i>lateralis</i> (black-flanked rock-wallaby) Threatened</p>	<p>The distribution of this species on Barrow Island is limited to rocky outcrops on the west coast.</p>	<p>No new or additional impacts as a result of the Revised Proposal.</p>	<p>Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p> <p>Not applicable. Species is restricted to the west coast of Barrow Island and the Revised Proposal does not involve any changes to the facilities on the west coast.</p>	<p>Species not addressed in PER.</p>
<p><i>Macropus robustus</i> <i>isabellinus</i> (Barrow Island euro) Threatened</p>	<p>This species is widespread on Barrow Island and require shade, especially during the hotter months, and often use artificial shelter.</p>	<p>Loss of an additional area of potential habitat as a result of the Revised Proposal.</p>	<p>The Revised Proposal is considered to have an unchanged risk to this species and is unlikely to have a significant additional impact to this species as:</p> <ul style="list-style-type: none"> <li>◆ species not restricted to the area described by the Revised Proposal</li> <li>◆ highly mobile species and able to move away from areas of disturbance</li> <li>◆ Revised Proposal represents a small loss of additional potential habitat (but within the 300 ha available on Barrow Island for gas processing activities under the <i>Barrow Island Act 2003</i> (WA)); however habitats are well represented outside the area of disturbance.</li> </ul> <p>Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p>	<p>Section 6.1</p>
<p><i>Malurus leucopterus edouardi</i> (white-winged fairy)</p>	<p>Barrow Island white-winged fairy wrens have been found to nest in a range of plant species including <i>Melaleuca cardiophylla</i>, <i>Acacia divinosa</i>, <i>A.</i></p>	<p>Loss of an additional area of potential habitat as a result of the Revised Proposal.</p>	<p>The Revised Proposal is considered to present an unchanged risk to this species and is unlikely to have a significant additional impact to this species as:</p>	<p>Section 6.1</p>

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Wren) Threatened	<i>coriacea</i> , <i>Hakea lorea</i> , <i>Grevillia pyramidalis</i> and <i>Triodia</i> sp. Nesting is not restricted to certain flora, and they nest in a variety of vegetation types (including <i>Spinifex</i> , <i>Triodia angusta</i> along the roadways on Barrow Island in areas without <i>M. cardiophylla</i> )		<ul style="list-style-type: none"> <li>◆ species not restricted to the area described by the Revised Proposal</li> <li>◆ species nests widely over a range of habitats; such habitats are well represented outside the area of disturbance and will remain undisturbed</li> <li>◆ Revised Proposal represents a small loss of additional potential habitat (but within the 300 ha available on Barrow Island for gas processing activities under the <i>Barrow Island Act 2003</i> (WA)).</li> </ul> <p>Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p>	Section 6.1
<i>Haliaeetus leucogaster</i> (white-bellied-sea-eagle) Migratory	Is considered a resident species on Barrow Island; occur and nest in a variety of locations around the coast of Barrow Island (typically high in trees or on cliffs).	Individuals may build nests on flare towers – the Revised Proposal includes a number of additional flare towers.	<p>The Revised Proposal is considered to present an unchanged risk to this species and is unlikely to have a significant additional impact to this species as:</p> <ul style="list-style-type: none"> <li>◆ species not restricted to the area described by the Revised Proposal</li> <li>◆ low risk of individuals building nests on flare towers and if it was to occur would have affects at the individual level only (rather than species level).</li> </ul> <p>Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p>	Species not addressed in PER.
<i>Glaucola maldivarum</i> (oriental pratincole) Migratory	This species has not been recorded from Barrow Island and is very unlikely to occur in the area.	Not applicable.	Not applicable.	Species not addressed in PER.
<i>Numenius minutus</i> (little curlew) Migratory	Vagrant species to Barrow Island.	Not applicable. Only 2 records during littoral bird surveys in 2003.	Not applicable.	Species not addressed in PER.
<i>Apus pacificus</i> (fork-tailed swift)	Vagrant species to Barrow Island. This species has not been recorded from	Not applicable.	Not applicable.	Species not addressed in

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<p>Migratory</p> <p><i>Puffinus pacificus</i> (wedge-tailed shearwater)</p> <p>Migratory</p>	<p>Barrow Island.</p> <p>This species feeds away from land areas in open water and is known to nest on North and South Double Islands off the east coast of Barrow Island. This species does not breed or nest on Barrow Island.</p>	<p>Lights and gas flares pose a risk to seabirds that frequent the coastline at night – the Revised Proposal will result in further lighting from additional infrastructure and includes a number of additional flare towers.</p>	<p>The Revised Proposal is considered to have an unchanged risk to this species and is unlikely to have a significant additional impact to this species as:</p> <ul style="list-style-type: none"> <li>◆ species not found in the area described by the Revised Proposal</li> <li>◆ species does not breed or nest on Barrow Island</li> <li>◆ light spill studies have demonstrated that light emissions are not expected to significantly increase with a third LNG train compared to the Approved Development</li> <li>◆ lighting strategy will be implemented to reduce light usage and their point-source intensity.</li> </ul> <p>Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p>	<p>Section 6.1</p> <p>PER.</p>
<p><i>Sterna caspia</i> (Caspian tern)</p> <p>Migratory</p>	<p>This species is not abundant on Barrow Island, although coastal surveys have recorded them primarily in the north-east and mid-east regions of the Island (including beaches either side of Town Point).</p>	<p>No new or additional impacts as a result of the Revised Proposal as no additional coastal habitat will be disturbed as a result of the Revised Proposal.</p>	<p>Not applicable.</p>	<p>Species not addressed in PER.</p>
<p><i>Hirundo rustica</i> (barn swallow)</p> <p>Migratory</p>	<p>This species has not been recorded from Barrow Island and is very unlikely to occur in the area.</p>	<p>Not applicable.</p>	<p>Not applicable.</p>	<p>Species not addressed in PER.</p>
<p><i>Macronectes giganteus</i> (southern giant-petrel)</p> <p>Migratory</p>	<p>This species has not been recorded from Barrow Island and is very unlikely to occur in the area.</p>	<p>Not applicable.</p>	<p>Not applicable.</p>	<p>Species not addressed in PER.</p>
<p><i>Meropops ornatius</i> (rainbow bee-eater)</p> <p>Migratory</p>	<p>This species has not been recorded from Barrow Island and is very unlikely to occur in the area.</p>	<p>Not applicable.</p>	<p>Not applicable.</p>	<p>Species not addressed in PER.</p>

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<p><i>Milviveringa veritas</i> (<i>blind gudgeon</i>) <i>Threatened</i></p>	<p>Two individuals of this species have been collected during stygofauna surveys on Barrow Island in 2002 – 2003. Both specimens were collected from the same bore which is located approximately 6 km to the south-west of the Revised Proposal (i.e. bore located outside the disturbance area).</p>	<p>Unplanned CO<sub>2</sub> migration to the surface or near-surface environment – the Revised Proposal will result in an accelerated rate of reservoir CO<sub>2</sub> injection.</p>	<p>The Revised Proposal is considered to have an unchanged risk to this species and it is unlikely to have a significant additional impact to this species as:</p> <ul style="list-style-type: none"> <li>◆ no direct impact to this species is expected</li> <li>◆ risk of unplanned CO<sub>2</sub> migration is very low</li> <li>◆ the bore where the species has been recorded is at least 3 km from the Barrow Fault and it is highly unlikely that any unplanned escape of CO<sub>2</sub> would migrate such a distance.</li> </ul> <p>Furthermore, there are no unacceptable cumulative impacts on this species as a result of the Gorgon Gas Development</p>	<p>Section 6.2</p>

### 13.5 Proposed Management Actions

Potential impacts to matters of NES from the Revised Proposal will be addressed through a series of management plans consistent with those required under conditions prescribed for the Approved Development in EPBC Reference: 2003/1294. These management plans address impacts associated with particular aspects of the development or the receptors that may potentially be impacted.

The management plans, programs and systems required by EPBC Reference: 2003/1294 are listed below and the objectives and key management actions of these are summarised in Table 15.2.

- ◆ Terrestrial and Marine Quarantine Management System
- ◆ Terrestrial Facilities Baseline State and Environmental Monitoring Program
- ◆ Coastal and Marine Environmental Monitoring Program
- ◆ Terrestrial and Marine Facilities Construction Environment Management Plan
- ◆ Terrestrial and Marine Facilities Operations Environment Management Plan
- ◆ Long-Term Marine Turtle Management Plan
- ◆ Carbon Dioxide Injection Monitoring Program
- ◆ Decommissioning and Closure Plan.

In addition to the above management plans and systems, the following procedures and programs are being developed for the Gorgon Gas Development:

- ◆ Fauna Handling and Management Procedures  
These procedures will cover activities that are likely to interact with vertebrate fauna (including birds and reptiles, but excluding invertebrates) on Barrow Island. The procedures will prescribe actions for the initial response to sick, injured or orphaned animals and directions for obtaining further guidance and/or information. Actions will include: management of fauna within trenches and other open pits, including protocols to manage trenches during times of flooding (e.g. cyclones); handling sick or injured fauna; euthanasia of animals for welfare reasons; vouchering specimens that may be required by the Western Australian Museum; managing fauna cleared from areas being developed; restricting vehicle speed limits.
- ◆ Vegetation Clearing Audit Procedures  
The purpose of these procedures is to determine the extent of clearing and rehabilitation on an annual basis. Actions prescribed in the procedures will include restricting vegetation clearing to approved areas and locating infrastructure on already cleared or disturbed areas to the maximum extent reasonably practicable.
- ◆ Soil CO<sub>2</sub> Monitoring Program  
The purpose of this program is to record and monitor the natural release of CO<sub>2</sub> from across the area of the predicted 50-year CO<sub>2</sub> plume, including targeted sampling at geological conduits to the surface, and at groundwater wells established across the island. Key management actions will include managing produced water and altering the rates and locations of CO<sub>2</sub> injection wells, and establishing a soil CO<sub>2</sub> release monitoring program.

It should also be noted that the issue of an approval for the Revised Proposal will be consistent with Australia's obligations under the relevant international agreements as discussed in Section 1.7.4.

## **13.6 Predicted Environmental Outcome to Matters of NES**

### **13.6.1 Marine Species**

The Revised Proposal is not considered to pose any significant new or additional risks to marine fauna listed as matters of NES in comparison to the Approved Development. The Revised Proposal is considered to have an unchanged risk to all of these species, with the exception of the flatback turtles (see explanation below) and is unlikely to have a significant impact to these species as:

- ◆ some species are not known from the shallow waters of the west coast of Barrow Island, are uncommon in the region and/or are unlikely to be present in areas affected by the Revised Proposal (e.g. most whale species)
- ◆ there is a low likelihood of vessel strike as most susceptible species (e.g. whale species) are only occasional visitors to the offshore, deeper waters of the east coast of Barrow Island (consequently, if vessel strike did occur it would impact at the individual level rather than the species or population level)
- ◆ additional light spill is not expected to extend further or affect new areas that were not identified as being affected by the Approved Development or result in a reduction in local population viability of marine species populations.

It is possible that the additional 800 m of the Revised Proposal causeway may increase the risk of disruptions to adult flatback turtle behaviour, beyond predicted disruptions from the Approved Development causeway. Therefore the risk of impacts to flatback turtles from the physical presence of the Revised Proposal Causeway was assessed as Medium as opposed to the Low risk rating given for the Approved Development (Table 7.2).

The implementation of various plans, programs and systems consistent with those that are required under conditions prescribed for the Approved Development in EPBC Reference: 2003/1294 is expected to manage the potential impacts of the Revised Proposal to a level consistent with that considered acceptable and therefore approved for the Approved Development. Furthermore, there are no unacceptable cumulative impacts on marine fauna listed as matters of NES as a result of the Gorgon Gas Development.

### **13.6.2 Terrestrial and Subterranean Species**

The Revised Proposal is not considered to pose any significant new or additional risks to terrestrial and subterranean fauna species that are listed as matters of NES in comparison to the Approved Development. Consequently, the Revised Proposal is considered to have an unchanged risk to such species and is unlikely to have a significant impact to these species as:

- ◆ some species have not been found in and are unlikely to occur in the disturbance footprint of the Revised Proposal (e.g. black-flanked rock wallaby)
- ◆ no species are expected to be restricted to the additional area of disturbance associated with the Revised Proposal and most species are widely distributed across Barrow Island
- ◆ most terrestrial species are highly mobile and would be able to avoid the areas of additional disturbance associated with the Revised Proposal
- ◆ relevant habitats are well represented outside the additional area of disturbance associated with the Revised Proposal and will remain undisturbed
- ◆ it is highly unlikely that any unplanned escape of CO<sub>2</sub> would migrate the distance to the area known to support the blind gudgeon. In addition, a comprehensive CO<sub>2</sub>

monitoring plan is to be implemented to detect any potential unplanned CO<sub>2</sub> migration.

The implementation of various plans, systems and programs that are required under conditions prescribed for the Approved Development in EPBC Reference: 2003/1294 is expected to manage the Revised Proposal impacts to a level consistent with that considered acceptable and therefore approved for the Approved Development. Furthermore, there are no unacceptable cumulative impacts on terrestrial and subterranean fauna species that are listed as matters of NES as a result of the Gorgon Gas Development.