ENVIRONMENTAL, SOCIAL AND ECONOMIC REVIEW of THE GORGON GAS DEVELOPMENT on BARROW ISLAND

EXECUTIVE SUMMARY
On behalf of the Gorgon Venture, I am pleased to present this Environmental, Social and Economic Review (ESE Review) to assist the Western Australian Government's consideration of the restricted use of Barrow Island for the proposed Gorgon gas development.

Central to the commercial viability of the development of the Gorgon gas field is the restricted use of Barrow Island: an internationally significant nature reserve and the site of Australia's largest onshore operating oilfield. The Gorgon Venture recognises the importance of the conservation values of Barrow Island to the community and has only selected this location after an exhaustive study showed there are no economically viable and environmentally acceptable alternatives.

The gas fields discovered in the Gorgon area represent Australia's largest undeveloped gas resource. As custodian of this resource, the Gorgon Venture accepts responsibility for developing this important resource in a sustainable manner. A successful development will deliver substantial economic and social benefits to current and future generations of Australians, while also protecting the environmental values of the region and delivering net conservation benefits.

In addition, the development of the Gorgon gas field will unlock the vast Greater Gorgon area reserves, which currently represent over 40 trillion cubic feet of gas, equal to some 25 per cent of Australia's total known gas resources.

ChevronTexaco, operator of the Gorgon gas field, has been involved in existing operations on Barrow Island for over 40 years. The management of these operations is widely recognised as a showcase for the coexistence of an oilfield operation and the protection and maintenance of conservation values.

ChevronTexaco's successful environmental performance on Barrow Island gives us the confidence that gas from the Gorgon field can be developed on the island in a way that continues to protect the conservation values while delivering enormous economic, social and net conservation benefits to Western Australia and Australia.

I invite you to read this ESE Review and welcome your comments.

Rhonda Zygocki
Managing Director
ChevronTexaco Australia Pty Ltd
The Gorgon Joint Venture Participants - ChevronTexaco, Shell and ExxonMobil (the Gorgon Venture) – are seeking in-principle approval for the restricted use of Barrow Island to develop the Gorgon gas fields. The Gorgon gas development proposal includes establishing a gas processing facility within a limited area of Barrow Island. Prior to deciding whether to grant in-principle approval, the Government of Western Australia requires detailed information on the environmental, social, economic and strategic aspects of the proposed development.

At the request of the Government, the Western Australian Environmental Protection Authority (EPA) will provide advice on environmental matters. The Department of Mineral and Petroleum Resources (MPR) will provide advice on social, economic and strategic aspects of the proposed development. This will enable an integrated assessment of the proposal to be prepared for Government. The Conservation Commission of Western Australia, as the Authority holding the vesting of the Barrow Island Nature Reserve, will also provide advice to Government.

This Environmental, Social and Economic Review (ESE Review) was prepared by ChevronTexaco on behalf of the Gorgon Venture to provide the EPA and MPR with a high-level evaluation of the key issues associated with the proposed Gorgon gas development. These issues were identified through an extensive stakeholder consultation process and provision of guidelines by the MPR.

Prior to consideration by the EPA and MPR, the ESE Review is available for public comment as detailed below.

Availability of the ESE Review for Public Comment
This ESE Review is available for public comment from 10 February 2003 until 24 March 2003. Copies of the ESE Review can be obtained from ChevronTexaco by telephoning the Gorgon Health, Environmental and Safety Administration Assistant on 08 9216 4000 or emailing your request to gorgon.info@chevrontexaco.com. The document can also be viewed on the Gorgon Australian Gas website (www.gorgon.com.au).

The document is also available for viewing at the following locations:

<table>
<thead>
<tr>
<th>Location</th>
<th>Contact Information</th>
</tr>
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<tr>
<td>Department of Environmental Protection Library</td>
<td>Ashburton Shire Council</td>
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<tr>
<td>Level 8, Westralia Square Building</td>
<td>Onslow Public Library</td>
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<tr>
<td>141 St Georges Terrace</td>
<td>Second Avenue</td>
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<td>Onslow WA</td>
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<tr>
<td>Department of Mineral and Petroleum Resources</td>
<td>Karatha Community Library</td>
</tr>
<tr>
<td>1st Floor, 100 Plain Street</td>
<td>Millstream Road</td>
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<tr>
<td>East Perth WA</td>
<td>Karatha WA</td>
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<tr>
<td>Research &amp; Information Centre</td>
<td>Battye Library</td>
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<tr>
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<td>Alexander Library Building</td>
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<td>25 Francis Street</td>
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Submission Process

Individuals and organisations are invited to submit comments on the ESE Review. Those intending to make a submission should refer to the main report, rather than this Executive Summary alone, prior to submitting comments, as the more comprehensive and detailed document may answer potential questions or address outstanding issues. A submission may comment on, provide information, and/or express opinions about the issues discussed in the ESE Review. It may also raise issues that you consider to have been overlooked in the ESE Review and/or suggest improvements to the conceptual development.

Reasons for conclusions stated in the submission should be stated clearly and supported by relevant data. The source of your information should also be included where applicable.

Comments from the public will assist Government in making its decision.

The closing date for public submissions on this ESE Review is 24 March 2003.

Submissions should be addressed to:

Mr Doug Betts
Department of Environmental Protection
Level 9, Wastalia Square Building
141 St Georges Terrace
Perth WA 6000

Submissions will be treated as public documents unless provided and received in confidence, subject to the requirements of the Freedom of Information Act 1992. They may also be quoted in full, or in part, in the EPA and MPR Bulletins and the Standing Interagency Committee of Chief Executive Officers’ ESE appraisal package.

Submission Checklist

Comments should be in writing and:

- list points so that the issues raised are clear – where possible
- refer each point to the appropriate chapter and section in the ESE Review (e.g., Chapter 4, Section 4.2)
- keep discussion of different sections of the ESE Review distinct and separate
- include relevant, factual and supportive information with details of the source

Also, remember to:

- identify the development (i.e., the Gorgon gas development)
- provide your name, address and date of submission
- identify any special interest you have in the development (where relevant)
- indicate whether your submission is to be kept confidential

Further Information

Further information regarding the Gorgon gas development proposal can be obtained from the Gorgon Australian Gas website (www.gorgon.com.au), or by contacting Mr Peter Coghlan, Government and Public Affairs Manager, Gorgon Gas Development on 08 9216 4000.
The vast reservoirs of untapped natural gas found in the Greater Gorgon area off Western Australia’s Pilbara coast contain in excess of 40 Tcf of gas, representing some 25 per cent of Australia’s total known gas resources. Developing this world-class resource is a matter of national importance as it would secure Australia’s position as a leading gas producer and provide a huge new source of wealth for both Australia and Western Australia.

Over the past 20 years, the Gorgon Joint Venture Participants have spent more than $800 million on exploration, development and marketing to prepare the Gorgon area for ultimate development. During this time, a number of development options and potential gas processing locations have been evaluated. In the late 1990s, customers were sought based on a processing facility located on the Burrup Peninsula. However, the high cost of transporting gas to this mainland location made the project internationally uncompetitive. As a result of continued efforts to improve competitiveness, Barrow Island – both an internationally important nature reserve and Australia’s largest operating onshore oilfield – has emerged as the development location that would enable gas from the Gorgon gas fields to be competitive in today’s market.

The decision to seek the restricted use of Barrow Island for the Gorgon gas development has not been an easy one for the Gorgon Venture. It has been made only after exhausting all other development alternatives. The island has been a Class A Nature Reserve since 1910 and is one of the most important wildlife refuges in Australia. It is home to a rich suite of wildlife, some of which are listed as threatened. Preserving these conservation values are a critical aspect of this development proposal.

The key to unlocking the Greater Gorgon reserves is the development of the Gorgon field – one of the largest single gas fields ever discovered in Australia. Establishment of gas processing infrastructure on Barrow Island would provide a catalyst for the future development of other Greater Gorgon area fields. Gas would be processed at that facility and transported through a gas pipeline to shore, enabling large new competitive supplies of gas to be delivered to the mainland.
Although the development of Gorgon gas would bring significant benefits, the Gorgon gas field presents some unique challenges. With little associated liquid hydrocarbons, development costs must be kept to a minimum to maintain commercial viability. In addition, Gorgon gas contains a relatively high content of carbon dioxide (CO₂) which results in substantial treatment cost and relatively large potential greenhouse gas emissions.

Minimising the distance between the gas field and the onshore processing facility is critical to making the Gorgon gas development internationally competitive. Barrow Island is the nearest landfall to the Gorgon gas field and lies directly between the field and the mainland. Its use would minimise pipeline costs and eliminate the need for expensive offshore platforms. Siting a gas processing facility on Barrow Island is therefore central to commercial viability.

Significantly, Barrow Island would also provide a unique opportunity to re-inject reservoir CO₂ into saline reservoirs deep beneath the island. This, combined with current best practice in plant design, would make the development one of the most greenhouse gas efficient projects of its type in the world, and would assist Australia address international concerns regarding greenhouse gas emissions.

ChevronTexaco (formerly WAPET), the operator of both the oilfield and the proposed Gorgon gas development, is proud of its environmental reputation and performance on Barrow Island. The management of the island oilfield is widely recognised as an industry benchmark for the coexistence of petroleum development and biodiversity protection. These achievements have been realised over a period of 40 years, while producing 300 million barrels of oil, and give the Gorgon Venture confidence to seek restricted use of the island for the Gorgon gas development under the continued stewardship of ChevronTexaco.

The use of Barrow Island for the Gorgon gas development would represent a strategic long term transition from the production of oil to clean natural gas on the island. The oilfield - which has provided revenue to the State and Commonwealth of
close to $1 billion at present day value - has declining production and the current life expectancy is 15-20 years. As oilfield operations are decommissioned, the disturbance, which is dispersed over the southern part of the island, will be progressively rehabilitated. Total land clearance for the current oilfield operations and Gorgon gas processing, for which an area of no more than 300 hectares is being sought, would represent less than five per cent of the island.

As operator of both the oil and gas ventures, ChevronTexaco would continue to hold overall management responsibility for operational activities on the island and for operating in a manner that protects the conservation values of Barrow Island.

For the past 40 years, the oilfield operation has underpinned conservation best practice in managing quarantine and the protection of the island from unauthorised visits. Without this environmental stewardship of Barrow Island, Western Australia would have needed to contribute millions of dollars to provide the same level of protection to the island, or risk loss of conservation value.

The development on Barrow Island would not impair the conservation values of the island, nor would it alter its Class A Nature Reserve status. The development would be deliberately sited to avoid areas of particular conservation significance. Use of Barrow Island for gas processing would ensure continued stewardship and funding of the protection of the island’s conservation values for decades to come. In addition, net conservation benefits would flow from the establishment of a Gorgon Environment Foundation. The Foundation would apply the knowledge and expertise gained from the conservation management of Barrow Island to the support of substantial projects that reflect the values of the island.

The Gorgon development would build on Australia’s current standing as a secure and reliable source of both LNG and gas for industrial use by providing an additional strategic gas supply hub to the State. It would also provide another major competitive gas supply to Western Australia, encouraging the establishment of additional downstream processing in regional areas.
Between now and the mid-2020s, the Gorgon gas development would contribute about $11 billion in investment expenditure at today's prices. Independent economic modelling indicates that $17 billion in taxes and royalties would be provided over the life of the development, which would generate extra export income of $2.5 billion annually. The development would stimulate 6000 jobs nationally, of which 1700 would be in the Western Australian workforce. It is estimated that more than 10 per cent of the construction and operational workforce could be sourced from the Pilbara region. This workforce would create flow-on economic benefits through spending in the region.

The Gorgon gas development would provide the impetus for the expansion of existing services and industries and attract a number of new ones. It would help underpin the development of new technologies and skills, for example in CO₂ sequestration and sub-sea technology, thereby creating regional capacity for future growth.

Western Australia's development has been underpinned by the resources sector for more than 100 years. During the past decade, this sector has been responsible for Western Australia's economic and employment growth being ahead of the rest of Australia. The Gorgon gas development would help to ensure that Western Australia maintains the high rate of economic growth and social benefits, such as low unemployment, that flow from a vigorous economy.

If in-principle approval for the restricted use of Barrow Island is granted, the Gorgon Venture is committed to undertaking all phases of the development in a safe, environmentally responsible and sustainable manner. As part of this commitment, the Gorgon Venture would work with all stakeholders to secure the success of the development. The Gorgon Venture is confident the development would provide substantial net economic, social and conservation benefits to both Western Australia and Australia.
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INTRODUCTION

The Greater Gorgon area, situated approximately 130 km off the north-west coast of Western Australia, contains one of the largest natural gas resources ever discovered in Australia. ChevronTexaco is the operator of the Gorgon area gas fields (see Figure 1) and proposes to develop these fields with its joint-venture partners, Shell and ExxonMobil (the Gorgon Venture).

Central to the commercial viability of the proposed development is the establishment of a gas processing facility on Barrow Island, which lies directly between the gas fields and the Australian mainland. Barrow Island has sustained one of Australia’s most important onshore oilfields since 1967 (see Figure 2). The island is also a Class A Nature Reserve of international importance with unique conservation values.

In response to approaches to the Western Australian Government in 2001, the Minister for State Development indicated that the Government would consider whether to grant in-principle approval for restricted use of Barrow Island for the proposed Gorgon gas development. This consideration would be made after assessing the environmental, social, economic and strategic ramifications of the proposed development, and providing there were net conservation benefits.
FIGURE 2

Oil Production Infrastructure on Barrow Island
It was agreed that the information would be presented in the format of an Environmental, Social and Economic Review (ESE Review) and made available for public comment.

**ESE REVIEW PROCESS**

Ultimately, the restricted use of Barrow Island for the proposed Gorgon gas development would require a range of government approvals – including a project-specific Environmental Impact Assessment under the Western Australian Environmental Protection Act 1986 and formal assessment under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. Prior to completing the detailed assessment studies required under those Acts, the Gorgon Venture seeks in-principle approval for restricted use of Barrow Island based on the proposed development concept. Receipt of in-principle approval would confirm that the restricted use of Barrow Island for a proposed foundation development has been considered and deemed acceptable at a strategic level.

Before deciding whether to grant in-principle approval, the Western Australian Government requested that relevant information on the environmental, social, economic and strategic ramifications and net conservation benefits of the proposed development be presented as this ESE Review. The Government specified that the ESE Review must demonstrate at a strategic level that the proposed Gorgon gas development can generate economic and social benefits, provide net conservation benefits and mitigate potential on-site impacts. The Government will make a decision on in-principle approval only after receiving public comment and advice on the ESE Review from the Western Australian Environmental Protection Authority, the Department of Mineral and Petroleum Resources and the Conservation Commission of Western Australia (see Figure 3).

This review was conducted against a detailed scope (ESE Scoping Document) (www.gorgon.com.au) established in accordance with Western Australia Government guidelines (www.mpr.wa.gov.au) and endorsed by relevant Government agencies.

Consistent with the level of information required to make an in-principle decision, the ESE Review was prepared by the Gorgon Venture at a strategic level. It focuses on issues critical to determining the sustainability of developing the Gorgon gas field with a gas processing facility on Barrow Island. This ESE Review also demonstrates how the proposed development would meet specific sustainability principles defined for the Gorgon gas development (see Box 1) and provide net conservation benefits.

In-principle approval is sought prior to the Gorgon Venture committing the substantial funding required to undertake the detailed engineering, environmental (including an Environmental Impact Assessment) and other studies required under Western Australian and Commonwealth legislation. In-principle approval would also provide potential customers for Gorgon gas with the confidence that the Gorgon Venture can deliver an internationally competitive development.
FIGURE 3

Summary of the ESE Review and Assessment Process

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<th>EIA Administrative Procedures (EPA, 2002)</th>
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<td>ESE Review Scoping Document</td>
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<td>Assessment</td>
<td>Gorgon Venture Response</td>
<td>Public Comment (6 weeks)</td>
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<td></td>
<td>Packaged Bulletins and advice with overarching Summary released through SIAC</td>
<td>MPR Bulletin EPA Bulletin Conservation Commission advice</td>
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<td></td>
<td>Government Advice</td>
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<td>Decision</td>
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<td>EP Act PTV EPBC Act</td>
<td>Project-Specific Approvals including Environmental Impact Assessment</td>
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**EXECUTIVE SUMMARY**

**RESOURCE BASE**

The Gorgon gas reserve is one of the largest uncommitted natural resources in Australia (see Figure 4).

The Greater Gorgon area contains an estimated gas resource in excess of 40 trillion cubic feet (Tcf), and is made up of two groupings of fields: the Gorgon area gas fields in the shallower water; and the deeper water fields which include the Io/Jansz fields located further offshore.

The Gorgon area contains certified gas reserves of 12.9 Tcf, and includes the Gorgon field, West Tryal Rocks, Spar, Chrysaor and Dionysus fields.

The Gorgon field is the largest field in this group, and one of the largest ever discovered in Australia.

Developing the Gorgon field is the key to unlocking the natural resource value of the Gorgon gas reserve – it is the most mature in terms of reservoir knowledge, the closest field in the area to land, and the most ready for market.

**BOX 1**

**Gorgon Sustainability Principles**

<table>
<thead>
<tr>
<th>Clean Energy Supply</th>
<th>The development will meet Western Australian, Australian and international demands for competitive, clean energy sources. It will also enhance energy competition and security of supply in Australia.</th>
</tr>
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<tbody>
<tr>
<td>Economic Benefit Delivery</td>
<td>Current and future economic growth in Australia will benefit from the development. It will foster economic growth and business development, generate government revenue, provide commercial returns to the Gorgon Venture and contribute to the wealth generated by Australia’s natural resource base.</td>
</tr>
<tr>
<td>Biodiversity and Ecological Integrity Protection</td>
<td>The Gorgon gas development will not disrupt ecological structure and function, nor will it result in a loss of biological diversity on Barrow Island.</td>
</tr>
<tr>
<td>Social Equity and Community Well being Enhancement</td>
<td>Communities will benefit from improved quality of life and well-being resulting from contributions of the Gorgon gas development such as creation of jobs.</td>
</tr>
<tr>
<td>Future Generations Commitment</td>
<td>The Gorgon gas development will meet the needs of the present generation and assist future generations to meet their needs.</td>
</tr>
<tr>
<td>Efficient Resource Use</td>
<td>International best practice and continual improvement principles will be applied to efficiently manage resources and wastes.</td>
</tr>
<tr>
<td>Precautionary Principle Application</td>
<td>Where there are threats of serious or irreversible damage, lack of full scientific certainty will not be used as a reason for postponing cost-effective measures to prevent environmental damage.</td>
</tr>
<tr>
<td>Community Respect and Safeguards</td>
<td>The Gorgon Venture will respect community values, community diversity and safeguard the well-being of the public and workforce throughout the development.</td>
</tr>
<tr>
<td>Stakeholder Engagement</td>
<td>The Gorgon Venture will seek the views of stakeholders and take their interests into account throughout development of the Gorgon gas fields.</td>
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<tr>
<td>Accountability</td>
<td>The Gorgon Venture is committed to the highest standards of governance and accountability. It will report regularly to the community on the sustainability performance of the development.</td>
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DEVELOPMENT OVERVIEW

The Gorgon field development plan is based on the installation of a sub-sea gathering system and a 70 km sub-sea pipeline to Barrow Island. A gas processing facility located on the central-east coast of Barrow Island would process the gas. Reservoir carbon dioxide would be removed and re-injected into deep saline reservoirs below the island. The liquid hydrocarbon product would then be transported by ship to international markets. Compressed domestic gas would be delivered via a sub-sea pipeline to the Western Australian mainland for use in the industrial and domestic gas markets.

Current market opportunities identified by the Gorgon Venture indicate that the foundation development for Gorgon gas would most likely be a Liquefied Natural Gas (LNG) plant. Therefore for the purposes of the ESE assessment, LNG has been modelled as a reference case in this document. However, the Gorgon Venture recognises that different gas processing opportunities such as gas-to-liquids could emerge, dependent on market forces. Specific project details would be included in the normal environmental approvals process and regulatory and licence applications that would follow if the government gives in-principle approval to restricted use of Barrow Island.

FIGURE 4
The Gas Fields of the Greater Gorgon Area

- Certified Reserve
- Discovery
The Gorgon gas development would require a range of infrastructure including wells and pipelines for gas recovery and delivery to a gas processing facility. Export pipelines to deliver gas to the domestic market would also be required. The reference case is the supply of Gorgon gas to a two-train LNG gas processing facility on Barrow Island. The facility would produce 10 million tonnes of LNG per annum, plus deliver 300 terajoules (TJ) of natural gas per day to existing mainland domestic gas infrastructure (see Figure 5).

Construction would be phased over 3 – 15 years, depending on the rate of market demand growth, and would include:

- installation of sub-sea gas production facilities at the Gorgon gas field (see Figure 6)
- construction of a feed gas pipeline to Barrow Island
- construction of an LNG processing facility at Barrow Island
- construction of domestic gas facilities and pipeline to serve the Western Australian gas market
A construction workforce of approximately 2200 personnel on the island is anticipated. This would reduce during the operations phase to approximately 150 people (see Table 1).

The gas processing facility and associated infrastructure would occupy a land area no greater than 300 ha, which equates to approximately 1.3 per cent of Barrow Island, for the life of the development. The associated infrastructure required on the island and in the adjacent marine area includes administration and accommodation facilities, materials lay-down area, materials offloading facility, feed gas pipeline and product loading jetty (see Figure 7).

The Gorgon Venture is committed to designing and constructing a world-class development with best-in-class environmental performance. To achieve this, the design of a Barrow Island gas processing facility is driven by principles such as:

- minimising impact on the surrounding environment by avoiding areas of high conservation value.

### Table 1

<table>
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<th>Phase</th>
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<td>Operational Phase</td>
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<td>300</td>
<td>150</td>
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executive summary

• minimising vegetation clearance
• minimising discharges to the environment
• high thermal efficiency minimising the use of resources
• adopting technologies which reduce emissions and minimise environmental impact

All necessary regulatory requirements such as licences, environmental approvals, and health and safety requirements would be met by the development as part of the planning, design, construction and operation of the gas processing facility.

If approval for the proposed development is granted, field development work could commence as early as mid-2005 (see Figure 8) with the aim of being ready to commence gas delivery in 2008. This schedule is subject to market demand. The Gorgon gas field would have a life of up to 30 years, but additional gas development opportunities could extend the production life of the gas processing facility beyond that time.
DEVELOPMENT ALTERNATIVES

The Gorgon Venture recognises that selecting the correct location for the gas processing facility is crucial to the successful application of the development’s sustainability principles and fundamental to the acceptability of the development. Extensive consultation has confirmed that it is also a key issue for government and community stakeholders.

Over the past 20 years, the Gorgon Venture has spent more than $800 million on exploration, development and marketing work to prepare for the ultimate development of Gorgon gas. During that time, a number of development options and potential gas processing locations have been evaluated. In the late 1990s, customers were sought based on a gas processing facility situated on the Burrup Peninsula. However, the concept was costly and therefore proved to be internationally uncompetitive.

This history led the Gorgon Venture to the preliminary conclusion that a gas processing facility site on Barrow Island could be the key to the commercial viability of the development. The Gorgon Venture subsequently undertook a systematic regional assessment to determine if that preliminary conclusion was valid.

The study considered environmental, social and broad economic constraints in a systematic process. The process moved progressively from a coarse regional-scale analysis, which included all areas within practicable reach of the Gorgon gas field, to detailed inter-area comparisons.

Based on a Geographic Information System (GIS) regional analysis within a 200 km radius of the Gorgon gas field, the following short-list of potential development locations were identified (see Figure 9):

- Montebello Islands
- Thevenard Island (central portion)
- Barrow Island
- Maitland Estate/West Intercourse Island
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• Holden Point (Burrup Peninsula)
• Exmouth South (Exmouth Peninsula)
• West Intercourse Island
• Cape Preston

Further qualitative comparisons of key development requirements and constraints of these sites eliminated:
• Montebello Islands (lack of usable land and history as a nuclear weapons test site)
• Exmouth South (high social, environmental and technical/cost constraints)
• Cape Preston (designated for mineral processing development and similar cost to Burrup Peninsula)
• West Intercourse Island (did not offer any significant advantages over the nearby Burrup Peninsula or Maitland Estate/West Intercourse Island concepts)

Key cost drivers for the remaining short-listed locations were assessed. The components of the development of each concept that have the greatest impact on the cost of construction and operation are listed and compared in Table 2. The Montebello Islands have also been included at the request of a number of stakeholders although they are not short-listed locations.

Extensive work beginning in 1997 identified that the only feasible site for re-injection of reservoir CO₂ for Gorgon gas was the Dupuy reservoir beneath Barrow Island. Disposal of reservoir CO₂ is considered to be a critical issue for a number of stakeholders. Therefore the cost to deliver CO₂ from each short listed location to Barrow Island is included in the comparison.

The cost constraints associated with the mainland locations, Burrup and Maitland Estate/West Intercourse Island mean that the development would prove highly uncompetitive, as confirmed by direct marketing experience in the late 1990’s. These locations were therefore rejected.

Thevenard Island remains as the only other potential location for the gas processing facility other than Barrow Island. However, it is still a significantly more expensive option than Barrow Island, its status as a Class C Nature Reserve also requires stringent quarantine restrictions, the LNG loading operations are in less sheltered waters, and the operating costs are higher for boat and helicopter transfer of personnel from Barrow Island or Onslow. Furthermore, unlike Barrow Island, it is located well south of the Greater Gorgon area reserves and most existing gas infrastructure, which would limit its utility as a strategic gas hub.

Finally, cost analysis has shown that a development on Thevenard would incur a $500 million increase in relative cost over the Barrow Island option. Direct marketing to prospective large-scale domestic gas customers has previously demonstrated Thevenard Island for such a development to be uncompetitive.

PREFERRED LOCATION

As a result of detailed analysis, Barrow Island was confirmed as the only location that balanced the environmental, social and economic requirements for the Gorgon gas development processing facility. This location would allow for the supply of LNG and industrial and domestic gas at internationally competitive terms. Significantly, Barrow Island also provides a location for long term geological sequestration of reservoir carbon dioxide (CO₂) through underground disposal.
Executive Summary Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island

Summary of Results of the Location Assessments

- **Gorgon Area Gas Fields**
  - **Barrow Island**: Performing well against technical, cost, and social requirements and constraints, but constrained environmentally. Found to be highly cost competitive.
  - **West Learmonth Island**: Performed moderately well on environmental and social requirements and constraints, however location was excluded from cost analysis as it failed other significant requirements
  - **Gage Point**: Performed moderately well against requirements and constraints and was excluded from cost analysis due to environmental and social constraints.
  - **Durranier Environ**: Excluded from cost analysis due to proximity to townsite and salinity.
  - **Westward Estate**: Suffused well against most requirements and constraints. However, assessment of commercial viability found location to be of high cost.
  - **Noth of Dridge**: Excluded from cost analysis as location failed to meet requirement for access to deep water. Also prone to flooding and storm surges and is adjacent to marine park.
  - **Exmouth North**: Excluded from cost analysis as location failed to meet technical cost requirements. Location does not provide good access to deep water.
  - **Exmouth South**: Excluded from cost analysis due to proximity to Ningaloo Marine Park and tourism infrastructure.

Sites for Further Investigation

- **Ningaloo Area Gas Fields**
- **Gas Field**
- **Composite Suitability**
- **Least Constrained**
- **Most Constrained**
- **Assessed as Not Suitable**
PREFERRED SITE ON BARROW ISLAND

There are a broad range of issues that must be considered in the selection of a site that will be safe, practical and allow the development to remain economically viable. To address these issues the Gorgon Venture has assessed potential sites on Barrow Island in some detail. This work has provided greater confidence that an acceptable site could be found on Barrow Island.

The broad selection criteria applied were:

- marine operability for LNG carriers approaching and berthing
- constructability of gas processing facilities
- safety
- environmental impact
- cost

### Table 2: Comparison of Key Cost Driver Components

<table>
<thead>
<tr>
<th>Key Cost Attributes</th>
<th>Short-listed Locations</th>
<th>Included on request</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Montebello Islands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trimouille</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Montebello Islands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hermite</td>
</tr>
<tr>
<td>Thevenard Island</td>
<td>Thevenard Island</td>
<td>Yes</td>
</tr>
<tr>
<td>Barrow Island</td>
<td>Barrow Island</td>
<td>Yes</td>
</tr>
<tr>
<td>Maitland Estate/West Intercourse Island</td>
<td>Maitland Estate/West Intercourse Island</td>
<td>Yes</td>
</tr>
<tr>
<td>Burrup Peninsula</td>
<td>Burrup Peninsula</td>
<td>Yes</td>
</tr>
<tr>
<td>Gas Pipeline Length</td>
<td>120 km</td>
<td>93 km</td>
</tr>
<tr>
<td>Offshore Platform</td>
<td>Required</td>
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</tr>
<tr>
<td></td>
<td>Not Required</td>
<td>Required</td>
</tr>
<tr>
<td></td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Jetty Length</td>
<td>1.1 km</td>
<td>0.5 km</td>
</tr>
<tr>
<td></td>
<td>3.9 km</td>
<td>2.9 km</td>
</tr>
<tr>
<td>Distance from Coast</td>
<td>0.1 km</td>
<td>0.2 km</td>
</tr>
<tr>
<td></td>
<td>0.7 km</td>
<td>0.1 km</td>
</tr>
<tr>
<td>Volume of Dredging</td>
<td>0.86 million m³ soft soils / sand</td>
<td>0.75 million m³ soft soils / sand</td>
</tr>
<tr>
<td></td>
<td>6.9 million m³ soft soils / sand</td>
<td>2.94 million m³ soft soils / sand</td>
</tr>
<tr>
<td></td>
<td>6.7 million m³ hard soils / rock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.8 million m³ hard soils / rock</td>
<td></td>
</tr>
<tr>
<td>Extent of earthworks</td>
<td>1.4 million m³ soft soils / sand</td>
<td>1.4 million m³ soft soils / sand</td>
</tr>
<tr>
<td></td>
<td>1.4 million m³ soft soils / sand</td>
<td>1.7 million m³ hard soils / rock</td>
</tr>
<tr>
<td></td>
<td>1.4 million m³ soft soils / sand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.7 million m³ hard soils / rock</td>
<td></td>
</tr>
<tr>
<td>CO₂ Pipeline Length</td>
<td>115 km</td>
<td>40 km</td>
</tr>
<tr>
<td>Relative Cost, Millions</td>
<td>+ $500</td>
<td>+ $70</td>
</tr>
<tr>
<td></td>
<td>Reference Point</td>
<td>+ $1100</td>
</tr>
<tr>
<td></td>
<td>+ $1000</td>
<td>+ $300</td>
</tr>
<tr>
<td>Useable Land (300 ha available)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
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<tr>
<td></td>
<td>Yes</td>
<td>No</td>
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<td></td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
The Gorgon Venture identified six areas on Barrow Island that met the broad criteria outlined above: **Latitude** and **Town Points** on the east coast, **Surf Point** on the north-east corner, **Flacourt Bay** and **The Chair** on the west coast and **Bandicoot Bay** in the south of Barrow Island (see Figure 10).

The Gorgon Venture concluded that **Town Point** would be the preferred site for the gas processing facility at this stage as it was considered to best meet the selection criteria. This site is close to the existing oil export tanks and minimises disturbance to sensitive areas.
EXECUTIVE SUMMARY

ECOLOGICAL REVIEW

Barrow Island has supported an oilfield operation with ChevronTexaco as operator (previously as WAPET and Chevron) for over 40 years. Some 300 million barrels of oil have been produced to date with the operation currently producing over three million barrels of oil annually.

ChevronTexaco’s management of oil production activities on Barrow Island includes an environmental plan based on internationally recognised best practices. As a result, Barrow Island remains an important refuge for threatened rare wildlife species while supporting oil production activities. The importance of Barrow Island as a wildlife refuge extends beyond its status as a Class A Nature Reserve – some of the wildlife species are endemic to the island and others are extinct, or near extinct, on the mainland.
The success of ChevronTexaco’s rigorous environmental management program, which includes restricted access and strict quarantine procedures, is evident in the continued health and stability of the island’s ecosystem – an ecosystem that is replete with a full suite of native species and is free from introduced animals. This success has been formally recognised by the receipt of a number of environmental awards and television coverage in renowned nature documentaries (see Box 2).

Selection of the site and design of the Gorgon gas processing facility have been tailored to avoid significant impacts on the widely recognised conservation values of Barrow Island – particularly its importance as a refuge for fauna (see Figure 11). As noted earlier, the total area for the proposed development would occupy an area no greater than 300 ha for the life of the development.

**BOX 2**

**Recognition of ChevronTexaco’s Environmental Performance on Barrow Island**

**Documentaries**
ChevronTexaco’s success in implementing a rigorous environmental management program on Barrow Island has been recognised in prestigious documentaries produced by the natural history units of the Australian Broadcasting Corporation (ABC) and the British Broadcasting Corporation (BBC).

**Awards**
ChevronTexaco’s environmental performance has also been formally recognised through receipt of the following environmental awards:

- 2002 UK Institute of Petroleum Environmental Award for its Barrow Island Environmental Management and Protection Efforts
- 2002 World Oil – The Next Generation Health, Safety, Environment/Sustainable Development Award for Barrow Island Oilfield, Environmental Management and Protection (inaugural)
- 2001 Australian Petroleum Production and Exploration (APPEA) Environmental Award (inaugural)
- 2000 Golden Gecko Certificate of Merit for Barrow Island Coastal Care Group
- 1994 Australian Minerals and Energy Environment Foundation (AMEEF), Environmental Excellence Award – Organisation "for preservation of flora and fauna on Barrow Island during 30 years of oil exploration and production"
- 1994 Western Australian Department of Minerals and Energy (WA DME) Environmental Excellence in Petroleum Operations, Certificate of Merit for overall environmental management of seismic exploration on Barrow Island and Thevenard Island
- 1991 WA DME Environmental Excellence Award Petroleum Category (inaugural), Barrow Island application of innovative techniques
Review of the potential ecological impacts and management priorities associated with the proposed development is based on considerable local and international expertise, past studies and surveys conducted on Barrow Island specifically for the ESE Review. Key marine and terrestrial resources of Barrow Island were identified and recorded and assessed by independent, specialist ecologists for their relative importance to the island’s biodiversity, ecological function and conservation value.

**FIGURE 11**

**Favourable Locations for the Town Point Site**
Specialist ecologists used a qualitative risk assessment process to assess the ecological impacts that could result from the development of a gas processing facility on Barrow Island. That work shows that the proposed development would not result in significant adverse impacts to important wildlife habitats, restricted vegetation types and marine habitats with conservation significance.
Loss of genetic diversity, populations, or species from Barrow Island can be avoided through the adoption and implementation of strict environmental mitigation and management measures. Key measures include: location and design of the gas processing facility to avoid threatened species, significant habitat, and restricted vegetation communities; use of international best practice pipeline construction methods to avoid direct disturbance to significant fauna habitat; further detailed geotechnical assessments to avoid significant cavernous formations; management of workforce activities; and movement and use of appropriate technology to reduce light-spill.

As operator of both the oil and gas ventures on the island, ChevronTexaco would seek to coordinate between the ventures on an enhanced rehabilitation program to progressively reduce the total operational footprint over time.

The Gorgon Venture is committed to undertaking all phases of the development in a safe, environmentally responsible and sustainable manner. ChevronTexaco’s strong environmental performance on Barrow Island to date demonstrates that it is possible to successfully implement internationally recognised best practice management measures and maintain ecological integrity.
QUARANTINE MANAGEMENT

A quarantine program was first introduced on Barrow Island in the mid-1960s in acknowledgement of the world-class conservation values of the island. This quarantine program has set the benchmark for offshore island petroleum operations in Australia and overseas, and is recognised for its excellence in environmental management.

As operator of the existing oilfield and the proposed Gorgon gas development, ChevronTexaco views quarantine as paramount to the protection of Barrow Island’s conservation values. The applied quarantine management, procedures, and restricted access have effectively prevented the establishment of invasive species on Barrow Island.

In order to maintain this quarantine record in the event the Gorgon gas development proceeds on Barrow Island, the Gorgon Venture would expand and enhance existing quarantine management procedures in order to control any increase in quarantine risk associated with the development.

ChevronTexaco, in its role as operator of both the Barrow Island oilfield and Gorgon gas development, would continue to provide overall management responsibility for operational activities on the island. This would include coordinating between the ventures on an enhanced quarantine program.
EXECUTIVE SUMMARY

Ongoing success in quarantine management will require the continuous pursuit of improvements in reducing point of source risks, in increasing detection and eradication success and in integrating quarantine into every aspect of the proposed gas development.

CONSERVATION AGREEMENT

The Gorgon Venture acknowledges the important role of Department of Conservation and Land Management (CALM) in the ongoing management of the conservation values of Barrow Island. In order to optimise the collective body of knowledge and expertise specific to Barrow Island, the Gorgon Venture would seek to work co-operatively with CALM in order to conserve the ecological structure and function of the island. To that end, the Gorgon Venture would enter into a formal Conservation Agreement with CALM, which would provide the framework for management decisions concerning the Barrow Island environment, provide a mechanism for adequate resources of CALM activities on the island, and provide an ongoing vehicle to undertake research on the island.

GREENHOUSE GAS MANAGEMENT

The Gorgon Venture is committed to the responsible management of greenhouse gas emissions associated with the proposed Gorgon gas development. This ongoing commitment is reflected in the “Gorgon Greenhouse Gas Management Strategy” – developed specifically for the proposed development of the Gorgon area gas fields.

This strategy is based on the assumption that the Gorgon gas field would be developed initially for LNG production.
Other gas processing opportunities and their management would be considered as they emerge. Total life-cycle emissions of LNG – spanning from production through to consumption – are markedly lower per unit of energy than coal or fuel oil (see Figure 12).

Integration of the "Gorgon Greenhouse Gas Management Strategy" into the gas processing facility design – from the early conceptual design phase to plant operation – means that the LNG processing facility proposed for Barrow Island would be the most greenhouse gas efficient facility of its kind in the Asia-Pacific region (see Figure 13), and one of the most efficient in the world. The design of the facility would incorporate best practices in thermal and greenhouse gas efficiency.

The greenhouse gas management strategy incorporates innovative, internationally recognised best practice techniques and design improvements that increase greenhouse gas efficiency. The strategy also features a plan to re-inject reservoir carbon dioxide (CO₂) into saline reservoirs beneath Barrow Island, unless it is technically infeasible or cost-prohibitive (see Figure 14). All of the studies undertaken to date by the Gorgon Venture indicate that re-injection is technically feasible.
Re-injection could avoid approximately 4.2 million tonnes of CO\textsubscript{2} emissions per annum based on two 5 million tonnes per annum (MTPA) LNG trains. It would avoid a further 0.6 MTPA of CO\textsubscript{2} emissions from a 300 terajoules per day (TJ/d) domestic gas supply (see Figure 15). Barrow Island is currently the only site for a gas processing facility that would allow re-injection of reservoir CO\textsubscript{2} and keep the price of Gorgon gas internationally competitive.

Development of knowledge and technology for re-injecting CO\textsubscript{2} as part of the Gorgon gas development would make Australia a world leader in this field. The Gorgon Venture has developed a strong working relationship with Australian and international researchers to ensure this knowledge would be shared and utilised in Australia. The Gorgon Venture’s Greenhouse Gas Management Strategy commits the proposed development to go beyond current Australian and International practice for the management of Greenhouse gas emissions and would assist Australia in addressing international concerns on greenhouse gas emissions.

**NET CONSERVATION BENEFITS**

As part of the Gorgon development concept, the Gorgon Venture plans to establish the “Gorgon Environment Foundation”. This Foundation would coordinate a range of significant conservation programs that would enhance Western Australia’s conservation estate and provide wide-ranging, long-term benefits to the community. These commitments would be over and above the environmental best practices that would continue to be maintained on Barrow Island.
The Gorgon Venture would play a pivotal role in the community-based Foundation that would fund and oversee a diverse range of programs reflecting the conservation values of Barrow Island. The Foundation could improve the conservation values of selected areas in the region as well as undertaking research and education projects based on marine and terrestrial conservation. It could include activities such as the restoration of degraded islands, the establishment of a research and education facility on Barrow Island, protection of endangered species through on-the-ground management and captive breeding programs, or provide ongoing support for important community-based conservation projects. Strong consideration would be given to a significant icon project that could deliver an enduring conservation outcome. It is important to note that none of these activities have been selected preferentially over any others at this stage.

The Gorgon Venture is committed to provide funding to commence the Foundation’s activities after the project has been sanctioned, an amount expected to exceed $10 million.

**STRATEGIC VALUE**

The vast reservoirs of untapped natural gas found in the Greater Gorgon area off Western Australia’s Pilbara coast are a world-class energy resource. Developing the resource is a matter of national importance as it would secure Australia’s position as a leading gas producer and provide a huge additional source of wealth and energy for the country and the State.

**FIGURE 14**

Barrow Island Reservoir CO₂ Re-injection Concept
There is a growing demand for energy in the Asia-Pacific region and the Australian domestic gas market. Current demand for LNG in the Asia-Pacific region is approximately 80 million tonnes per year and is forecast to more than double by 2015 (see Figure 16). The LNG markets of Japan, South Korea and Taiwan are expected to continue to comprise the bulk of this demand. Emerging markets in the west-coast of North America, China and other Asian countries will also add significant opportunities.

There is a window of opportunity for Australia to secure this gas development. A short delay now could result in a long delay in the ultimate development as gas supplies in competing countries move forward to fill the projected increase in demand.

The Gorgon gas development would provide a range of long-term strategic benefits at national, state, and regional levels. Australia would benefit from a new major competitive and more secure gas supply for the next phase of energy-intensive industry development and power generation.

As illustrated in Figure 17, economic modelling predicts that without development of Gorgon gas, there will be a gap in Western Australia’s gas supply due to declining production and an increase in demand.

Currently, some 60 per cent of domestic gas is supplied from the North West Shelf Gas Project making Western Australia critically dependent on the security of one project. The bulk of industry in Western Australia is also dependent on connection to this source via the Dampier to Bunbury Natural Gas Pipeline. The Gorgon Venture is committed to working with government agencies to develop domestic gas opportunities for Western Australia and establish a physical connection to the mainland transmission network in order to enhance the security of domestic gas supplies. The contribution of the Gorgon gas development to enhancing gas market competition has important implications for the...
continued international competitiveness of the Western Australian economy.

The additional availability of gas in Western Australia will also bring benefits to customers from the downward pressure on delivered gas prices. Economic modelling conducted for the Gorgon Venture predicts that the increased competition associated with the introduction of a major new gas supply will reduce delivered gas prices to domestic gas consumers on a state-wide basis by between two per cent and seven per cent over a 10-year period. These predicted price reductions are particularly significant for industrial development in the South-West and Goldfields regions, which have great potential for expansion in mineral processing and energy-intensive production of metals.
The Gorgon gas development will actively support Australian industry participation as a core business policy. Implementation of this policy would be formalised through the execution of an Australian Industry Participation Plan and will constitute a major commitment by the Gorgon Venture to sourcing regional, Western Australian and Australian suppliers. Specific areas where a high degree of Australian industry participation can be achieved include site preparation and development, civil works and installation. Other areas such as major equipment and instrumentation provide a high degree of technology transfer and added capability. The Gorgon gas development offers significant strategic value to both Western Australia and Australia by increasing security of supply and competition, adding value throughout the Western Australian economy and providing opportunities for Australian industry participation and regional business development.

The development of the Gorgon gas resource is consistent with government objectives and policy. The State and Commonwealth Governments both identify the resource industry as key to economic growth and actively encourage the development of the nation’s resources. Development of the Gorgon gas field could be a catalyst to further development of the Greater Gorgon area gas resource which would multiply the benefits of the initial development.

**ECONOMIC REVIEW**

Extensive analyses using macroeconomic and gas market modelling were conducted to evaluate the potential benefits from developing the Gorgon area gas fields.
Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island

Executive Summary

Economic modelling predicts that the Gorgon development on Barrow Island would make a major contribution to Australian and Western Australian economic growth by:

- contributing some $11 billion of investment expenditure (at today’s prices) between now and the mid-2020s
- generating net exports averaging $2 billion annually (at today’s prices) over the period from 2012 to 2030
- permanently adding and sustaining around 6000 jobs to national employment, 1700 of which would be in Western Australia
- contributing company tax and Petroleum Resource Rent Tax payments totalling $17 billion (at today’s prices) over the life of the development

It is estimated that more than 10 per cent of the workforce required for the construction and operational workforce could be sourced from the Pilbara region. This workforce would create economic benefits through spending in the region.

General economic growth would provide flow-on benefits for business, employment and government revenues (see Figure 18). Western Australia would reap the greatest share of the benefits from this growth as it is the state in which the development would take place. The Pilbara region would benefit from sustained regional development through increased demand for goods and services that would stimulate business development and employment opportunities.

The Gorgon gas development would substantially increase government revenues both through the direct payment of taxes by the Gorgon Venture and the workers and businesses associated with the development (see Figure 19).

![Figure 18: National GDP and Employment Benefits](source: National and WA Economic Impacts of the Gorgon Gas Supply and LNG Projects, Access Economics 2002)
The Gorgon gas development would provide the impetus for the expansion of existing services and industries and attract a number of new ones. It would help underpin the development of new technologies and skills, for example in CO₂ sequestration and sub-sea technology, thereby creating regional capacity for future growth.

**SOCIAL REVIEW**

Western Australia’s development has been underpinned by the resources sector for more than 100 years. During the past decade, this sector has been responsible for Western Australia’s economic and employment growth being ahead of the rest of Australia. The Gorgon gas development would help to ensure that Western Australia maintains the high rate of economic growth and social benefits, such as low unemployment, that flow from a vigorous economy. Establishment of the initial infrastructure on Barrow Island would provide a catalyst for the future development of the Greater Gorgon area gas fields, bringing a significant expansion and extension of the benefits.

Increased economic growth would lead to new employment opportunities, increased government revenues and consequent capacity to provide community services, and a rise in the spending power of Western Australia’s population. Direct benefits from construction and operation of the development would include new, high-skilled jobs and opportunities for Western Australian businesses.

The Pilbara region would benefit from increases in the number and range of jobs, and from the growth of regional businesses. In particular, Indigenous employment and business development would be stimulated by the development. The Gorgon gas development would also stimulate growth of several Pilbara towns.
The supply of large competitive supplies of gas from the Gorgon field would stimulate further industrial development in the Pilbara and other regions throughout Western Australia. New and expanded industries would in turn provide additional employment and business opportunities.

The design, construction and maintenance of the Gorgon gas development would provide many opportunities for technology transfer to Western Australian businesses and capacity-building that would enable them to service other resource and industrial projects in the State and elsewhere.

The Gorgon Venture, in partnership with other stakeholders, would take action to maximise the benefits for Western Australia and the Pilbara region. Such stakeholders include government, business groups and Indigenous organisations. Any increase in the demand for social infrastructure would be managed through cooperative action between the Gorgon Venture and government so that social amenity is not adversely affected by the development.

**STAKEHOLDER CONSULTATION**

Comprehensive assessment of stakeholder comments and questions about the proposed development is critical to the success of the ESE Review process. As this requires the participation of government and non-government stakeholders, the Gorgon Venture adopted an active approach to consultation throughout the lead-up and preparation of the ESE Review.
Executive Summary

Engaging stakeholders provided the Gorgon Venture with valuable input and feedback on the ESE Review process and the development concept. These stakeholders include State and Commonwealth government agencies, environmental groups, industry, media and the community. This process has led to a more comprehensive picture of stakeholder concerns and expectations. It has also clarified issues and sensitivities particular to various stakeholder groups. As a result, these issues are better addressed in the ESE Review.

There was general support for the concept of the ESE Review and the level of public involvement in the process. Similarly, there was general support for growth in the use of natural gas and the development of clean fuels. Development of the Gorgon gas reserves was also viewed as important, with stakeholders acknowledging both the direct and indirect economic and social benefits that the development could deliver.

There were a number of stakeholders opposed to further development on Barrow Island. Concerns included protecting the Class A Nature Reserve status of Barrow Island, fauna and habitats, the marine environment and quarantine. Additional concerns also included greenhouse gas emissions, securing gas supplies for Western Australia and ensuring that the ESE Review process was transparent and appropriate. There has been considerable support and encouragement for the application of sustainability principles by the Gorgon Venture.

Sustainability Review

The Gorgon Venture’s approach to sustainable development goes beyond review of separate environmental, economic and social
development implications. Instead these factors are considered within a single sustainability framework. This process is a first for Western Australia and one of the few sustainability assessment processes documented internationally for a specific development.

The Gorgon gas development sustainability concept is in alignment with the Western Australian Government’s definition of sustainable development.

The intention is to develop the Gorgon area gas fields in a manner that is consistent with key concepts of sustainable development. To this end, a set of development-specific, sustainability principles was established and applied to the proposed development (see Box 1). These principles reflect the commercial, environmental, social, economic and strategic objectives of the development and are based on widely accepted sustainability principles and key questions that were raised by a diverse range of stakeholders in an extensive consultation process conducted over a period of 18 months.

The Gorgon Venture is demonstrably committed to sustainable development and is resolved to successfully achieving each of the ten Gorgon gas development sustainability principles.

COMMITMENTS

This ESE Review has identified a range of potential environmental, social, economic and strategic issues that would need to be appropriately addressed, should the Gorgon gas development proceed on Barrow Island. To address these issues the Gorgon Venture is prepared to enter into the following commitments.

1. The Gorgon Venture would limit the new area of development including that of the gas processing plant, pipelines and associated infrastructure such that it would occupy an area not more than 300 ha or approximately 1.3 per cent of Barrow Island, for the life of the development.

2. The Gorgon Venture is committed to the preparation and implementation of a comprehensive management plan that would account for known and potential ecological impacts, and would outline management options to mitigate risk.

3. The Gorgon Venture would seek to enter into a formal Conservation Agreement with CALM which would provide the framework for management decisions concerning the Barrow Island environment, provide a mechanism for adequate resources of CALM activities on the island, and provide an ongoing vehicle to undertake research on the island.

4. The Gorgon Venture would build on existing ChevronTexaco quarantine management procedures and develop stringent measures to prevent the introduction of invasive species to Barrow Island.

5. ChevronTexaco, in its role as operator of both the Barrow Island oilfield and the Gorgon gas development, would continue to provide overall management responsibility for operational activities on the island.
6. The Gorgon Venture would plan for re-injection of reservoir CO₂ and implement current best practices in greenhouse gas management which involves the adoption of best practices in thermally efficient plant design, preparation of a Greenhouse Gas Management Plan, update the Greenhouse Challenge Cooperative Agreement, and continue to support research and development in greenhouse gas abatement.

7. The Gorgon Venture would establish and fund the “Gorgon Environment Foundation” to develop and employ a range of strategies and projects intended to deliver net conservation benefits to Western Australia reflecting the conservation values of Barrow Island. This includes a funding commitment which is expected to exceed $10 million.

8. The Gorgon Venture is committed to working with customers and government agencies to develop domestic gas opportunities for Western Australia, and establish a physical gas supply connection to the mainland transmission network in order to enhance the security of domestic gas supplies on a schedule to be agreed with the State Government.

9. The Gorgon Venture would actively support Australian industry participation as a core business policy and would implement an Australian industry participation plan.

10. Gorgon Venture would seek to employ a workforce sourced largely from Western Australia, including regional areas, and one that reflects the diversity of the Western Australian community.

11. The Gorgon Venture would work with the State Government and educational institutions to assess the education and training requirements of the development and to cooperate in designing programs that would meet these requirements.

12. The Gorgon Venture would work closely with Commonwealth and State Government programs designed to enhance business development in regional areas, facilitate the participation of regional businesses in the development, enhance communication with business and contractors, and adopt procurement policies that provide opportunities for regional businesses.

13. The Gorgon Venture would work with government, Indigenous groups and other resource companies to contribute to employment and business development opportunities for Indigenous people.

14. ChevronTexaco, as operator of the Gorgon gas development, aims to achieve world-class performance in health and safety. Best practice programs and systems to protect those employed on the project as well as the wider community would be implemented.

15. The Gorgon Venture would maintain open and accountable processes through all stages of the development that encourages stakeholder engagement in relation to the Gorgon gas development.

16. The Gorgon Venture would comply with
all legislation relevant to the proposed gas development on Barrow Island.

17. The Gorgon Venture would prepare and implement a sustainable development program specific to the proposed Gorgon gas development.

CONCLUSION

The Gorgon Venture has provided the information in this Economic, Social and Environmental Review to enable the Western Australian Government’s consideration of the possible restricted use of Barrow Island for the proposed Gorgon gas development.

The Gorgon Venture recognises the importance of the conservation values of Barrow Island to the community and has only selected this location after exhaustive study and evaluation work showed there are no economically viable and environmentally acceptable alternatives.

A specific site on Barrow Island has been identified which can provide the necessary area for the gas processing facility without compromising the environmental values of the island. The area to be used for gas processing would be limited to 300 ha, and the restricted use of Barrow Island would not alter the status of the Class A Nature Reserve covering the entire island.

The ecological impacts that could result from the development of a gas processing facility on Barrow Island have been assessed by independent, specialist ecologists using a qualitative risk assessment process. Review of that work shows that the proposed development would not result in significant adverse impacts to important wildlife habitats, restricted vegetation types, or marine areas with unique conservation significance.

A significant benefit of Barrow Island is that it provides a unique opportunity to permanently dispose of reservoir CO2. While subject to further evaluation and confirmation, such a re-injection program would enable Gorgon to be one of the most greenhouse efficient projects of its kind in the world.

The development would provide some 6000 jobs throughout Australia, of which 1700 jobs would be in Western Australia. Over the life of the development, there would be $11 billion in new investment and $17 billion in State and Commonwealth taxes and royalties. Annually, Gross Domestic Product (GDP) would be increased by $3.6 billion and projected exports by $2.5 billion.

The development would benefit local communities through small business development and training opportunities in the Pilbara region. The development would also provide for technology transfer, capability-building and would provide Indigenous employment and training opportunities.

If the development proceeds, the Gorgon Venture is committed to implementing a comprehensive net conservation benefits program that would enhance Western Australia’s conservation estate and provide wide-ranging, long-term conservation benefits to the community. The Gorgon Venture has proposed the establishment of the Gorgon Environment Foundation to secure these benefits.
 EXECUTIVE SUMMARY

The development of the Gorgon field will be a catalyst for the further development of the Greater Gorgon area gas resource. This would multiply the benefits of the initial development described in this document. The development would provide a second strategic gas supply hub and another major competitive gas supply to Western Australia, encouraging the establishment of additional downstream processing in regional areas.

The option to defer or not develop the resource results in a significantly less favourable outcome for Western Australia, Australia and the Pilbara when environmental, economic, social and strategic factors are considered.

This report has been reviewed by an Expert Panel which has concluded that the investigations satisfy the requirements of the ESE Review Scoping Document and that the findings and conclusions of the ESE Review are valid and justified.

As required by the State, this ESE Review demonstrates at a strategic level that the proposed Gorgon Gas development on Barrow Island would be sustainable. The development would provide net economic, social and conservation benefits while mitigating onsite impacts.

WAY FORWARD

Before deciding whether to grant in-principle approval to the Gorgon Venture for restricted use of Barrow Island, the Western Australian Government will consider agency advice, public comment and any other documentation and advice it considers relevant.

If in-principle approval is granted, the Gorgon Venture would be able to continue with the marketing, engineering, environmental and commercial investigations necessary to develop the Gorgon gas fields. In-principle approval would also provide the commercial confidence required for the Gorgon Venture to enter into binding commercial arrangements with potential customers.

Once customer commitments have been achieved, application would be made for formal approval of a specific development project under Part IV of the Western Australian Environmental Protection Act 1986. Additional or related approvals would also be required under a range of other legislation.