1. Introduction

1.1 Purpose of the EIS

This Draft Environmental Impact Statement (EIS) for the Sunrise Gas Project has been prepared in accordance with Clause 8 of the *Administrative Procedures of the Environmental Impact Assessment Act 1982* of the Northern Territory and paragraph 4.1 of the Administrative Procedures under the *Commonwealth Environment Protection (Impact of Proposals) Act 1974* of the Commonwealth. The document provides information concerning the design, construction and operation, and the potential environmental impacts and associated management of the proposed development of the Greater Sunrise Gas Field.

The purpose of the document is to provide:

- Sufficient information such that individuals and groups may gain an understanding of the project, the environment that would be affected, the potential impacts and the measures proposed to minimise those impacts;
- A basis for public consultation; and
- A framework against which the regulatory authorities can consider the environmental aspects of the proposal, set conditions for approval to ensure environmentally sound development and recommend an environmental management and monitoring programme.

1.2 The Proposal

The Sunrise Gas Project Joint Venture, operated by Woodside Energy Ltd (Woodside), proposes to develop the Greater Sunrise gas and condensate fields (Greater Sunrise) which are located approximately 450 km north west of Darwin in Timor Sea permits NT/P55, NT/RL2, ZOCA96-20 and ZOCA95-19 (**Figure 1-1**). Investigations indicate that Greater Sunrise Field Development has a 'Scope for Recovery' in the order of 9 trillion cubic feet of gas and 320 million barrels of condensate. Permit Area NT/RL2 contains approximately 80% of the gas to be extracted.

1.3 Background

Greater Sunrise comprises the Sunrise and Troubadour Gas Fields located within permit areas, NT/RL2 (78.9%), NT/P55 (1%), Z96-20 (0.1%), Z95-19 (20%). Permit areas Z96-20 and Z95-19 fall within the Zone of Corporation A (ZOCA) with the remaining permit areas located in Australian waters.

This gas and condensate resource was initially discovered in 1974 with the successful drilling of the Troubadour-1 well and the Sunrise-1 well in the following year. Then in 1975, Indonesia invaded and annexed the former Portuguese colony of East Timor. After that time, no agreement was reached on maritime boundaries between Australia and Indonesia until 1991 when the Timor Gap Treaty was signed between Australia and Indonesia, creating the Zone of Cooperation (ZOC). ZOC was established between the Governments of Indonesia and Australia to facilitate co-operative development of the areas oil and gas fields. Under this agreement three sectors were designated (A,B,C) comprising 60,000 km^2 of seabed.

In May 1997, a project was conceived by the Northern Australia Gas Venture (NAGV) formed as a joint venture between Woodside and Shell Development (Australia) Pty Ltd, to develop a liquefied natural gas (LNG) plant and a domestic gas supply for Darwin and elsewhere in Australia. This project was based on gas from the Greater Sunrise and Evans Shoal fields.

Further appraisal of the resources began with the Loxton Shoals-1 well, which was drilled in August 1995. Additional wells drilled since then demonstrated that both fields extend into the Zone of Cooperation.

In March 1999, Shell and Woodside announced that the LNG Plant Feasibility Study concluded the LNG project as technically feasible, but commercially the project was immature due to the lack of appropriate LNG market opportunities. This 'lack of market' was fundamentally due to the effects of the Asian economic crisis. In April 1999 Phillips Petroleum Company (Phillips) became a participant in the joint venture when it acquired BHP's interests in several Timor Sea permits, which included the permits for the Sunrise, Troubadour and Loxton Shoals static gas resources.

During the second half of 1999, a joint study of the markets and infrastructure required to bring Timor Sea gas to the Northern Territory and the wider east coast markets was undertaken. As a result of the study, and buoyed by discussions with potential foundation gas consumers, NAGV commenced actively pursuing a development to supply only domestic gas markets in Australia.

In August 1999, the United Nations held a referendum in East Timor to ascertain the population's desire regarding a) continued existence as a province of the Republic of Indonesia, or b) as a separate independent, nation state. The majority of the population voted for independence and since shortly thereafter, East Timor has been administered by the United Nations Transitional Administration in East Timor (UNTAET). An exchange of diplomatic notes and a Memorandum of Understanding (MoU) between Australia and UNTAET, on behalf of East Timor, continued the terms of the Timor Gap Treaty until a new treaty could be negotiated.

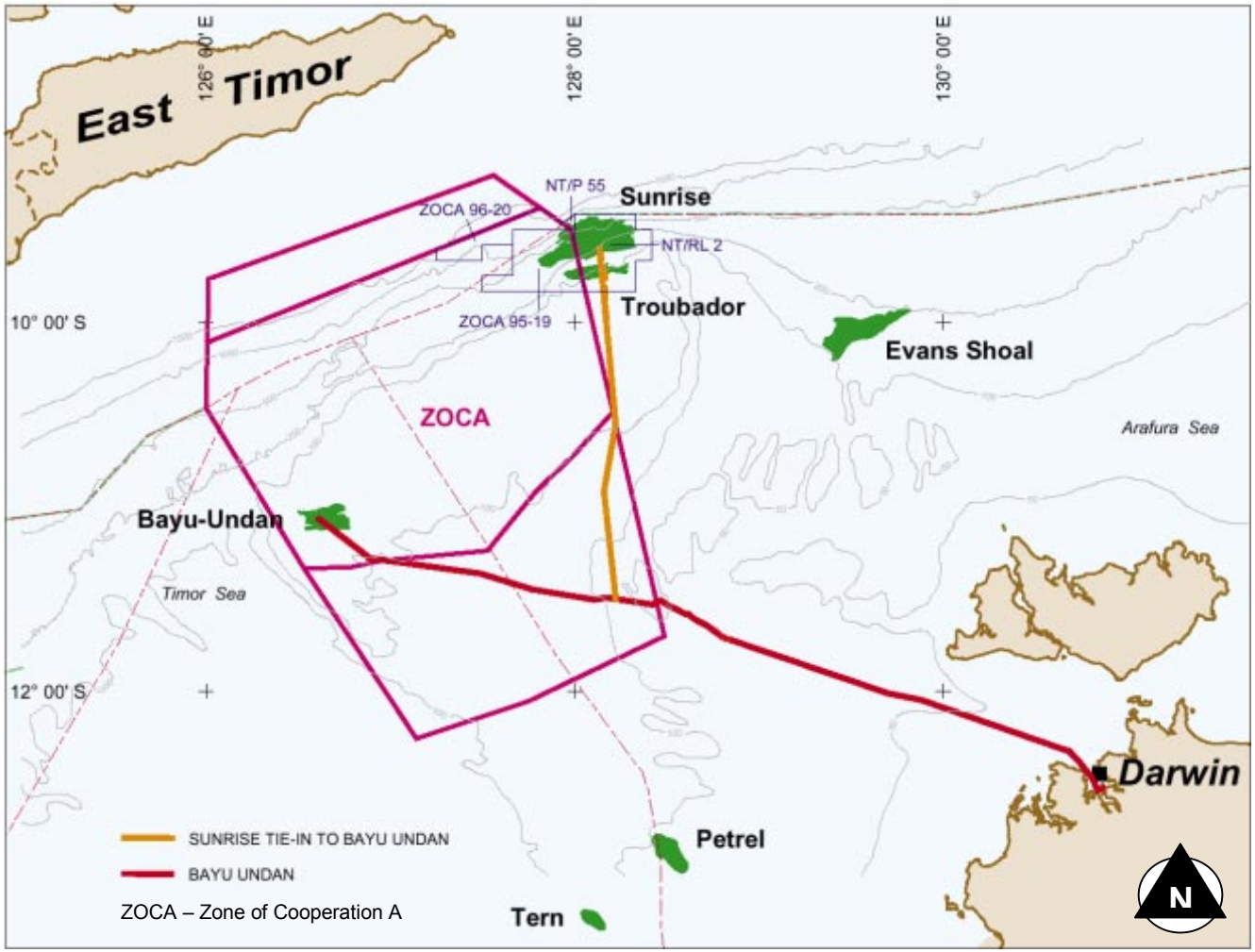
Eastern States opportunities and other domestic gas co-locators in a number of combinations and sizes have been investigated. This included power generation & downstream industries such as ammonia/urea, plastics, and minerals processing in the Northern Territory and elsewhere in Australia. To promote wider east coast gas supply opportunities, a marketing presence was established in Queensland.

Woodside and Phillips announced on 30 November 2000 that they had reached in-principle agreement to pursue cooperative development of their Timor Sea gas resources in the Sunrise and Bayu-Undan projects. The concept was designed to combine the early gas delivery potential of the Bayu-Undan development with the larger reserve base of the Greater Sunrise fields and to optimise investment in infrastructure. The Cooperative Agreement Principles were signed by Phillips, Woodside and Shell in February 2001.

In March 2001 El Paso Global LNG signed a LoI with Phillips, was intended to result in the delivery of 4.8 million tones per annum of LNG from the proposed LNG Plant in Darwin. Deliveries are planned to commence as early as 2005 for about 20 years.

Concept selection and further marketing efforts have continued. Woodside, acting as Operator on behalf of the Joint Venture, has continued to acknowledge the potential importance of domestic customers. However, the lack of a critical market mass in the vicinity of Darwin and the costs associated with supplying more remote customers, has again shifted the focus back to securing an LNG based development.

In September 2001 Shell tabled the Floating LNG (FLNG) concept providing an alternative market to onshore LNG. Under this proposal, a different primary market scenario is addressed, and the scope of the Sunrise Gas Project reduces to field development to supply raw wellstream to the customer FLNG project; rather than supply of either salesgas to Wickham Point with offshore export of tanker specification condensate or two phase gas and condensate to Wickham Point.



Source: Woodside

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Sunrise Gas Field Location and Surrounding Gas Fields

Figure 1-1
Project No.: DE2090.100
Figure prepared by: T.Lee
Date Prepared: 16/10/01

Thus two Sunrise Gas Project development options are therefore under consideration:

- Supply to onshore markets most likely LNG – on either a direct stand-alone basis or indirectly, in co-operation with the Bayu-Undan project; or
- Supply to an offshore Floating LNG project.

The variation in the needs of these customers in terms of gas supply requires that the design and development of Greater Sunrise is able to accommodate gas supply to both markets as they emerge.

1.4 The Proponent

The Sunrise Gas Project is a joint venture between:

Woodside (Operator)	33.44%
Phillips STL Pty Ltd	30.0%
Shell Development (Australia) Pty Ltd	26.56%
Osaka Gas Australia Pty Ltd	10.0%

The designated operator of the Sunrise Gas Project is:
Woodside Energy Ltd
1 Adelaide Terrace
Perth WA 6000

Woodside is responsible for annual production of oil and gas of approximately 146 million barrels of oil equivalent, which has a value of about $4 billion per annum. The majority of this production is exported, with a significant part being shipped to Japan as LNG.

Woodside Energy Ltd is a leading oil and gas company and one of Australia's most successful explorers, developers, and producers of hydrocarbon products. As a participant in, and Operator of, the North West Shelf Joint Venture, Woodside is directly responsible for the management of offshore and onshore assets worth more than $9 billion. On Western Australia's North-West Shelf, Woodside operates the North Rankin A and Goodwyn A offshore production platforms, the Cossack Pioneer Floating Production Storage and Offtake (FPSO) facility and the Onshore Gas Plant (OGP) on the Burrup Peninsula near Karratha as shown in **Figure 1-2.**

Outside the North West Shelf, Woodside is producing from two significant oil fields, Laminaria and Corallina, some 500 km north west of Darwin using the FPSO Northern Endeavour. Woodside is also the Operator of other exploration joint ventures and is actively seeking to increase its exploration portfolio.

Phillips Petroleum Company was founded in 1917 and is headquartered in Bartlesville, Oklahoma, USA. The company has a reputation for developing world-scale projects, pioneering technological efforts including LNG processing and creating value through regional infrastructure cooperation. In

April 1999, Phillips acquired BHP's interest in several Timor Sea permits and is the Operator of the Bayu-Undan field.

Shell is a major participant in the Australian upstream oil and gas industry. The company has been exploring for oil and gas onshore and offshore in and around Australia for nearly sixty years. Shell's extensive involvement in LNG projects worldwide has afforded it the opportunity for steady technical improvement in LNG processing. For example, production train size has increased from one million tonnes in the 1960's to planning today for train sizes of more than four million tonnes capacity per year.

Osaka Gas Australia Pty Ltd, a subsidiary of Osaka Gas Company of Japan, is Japan's second largest gas supplier. Osaka Gas is a foundation customer for LNG from the NWS. The company has two LNG receiving terminals and has plans for a third receiving terminal.

1.5 Description of Project

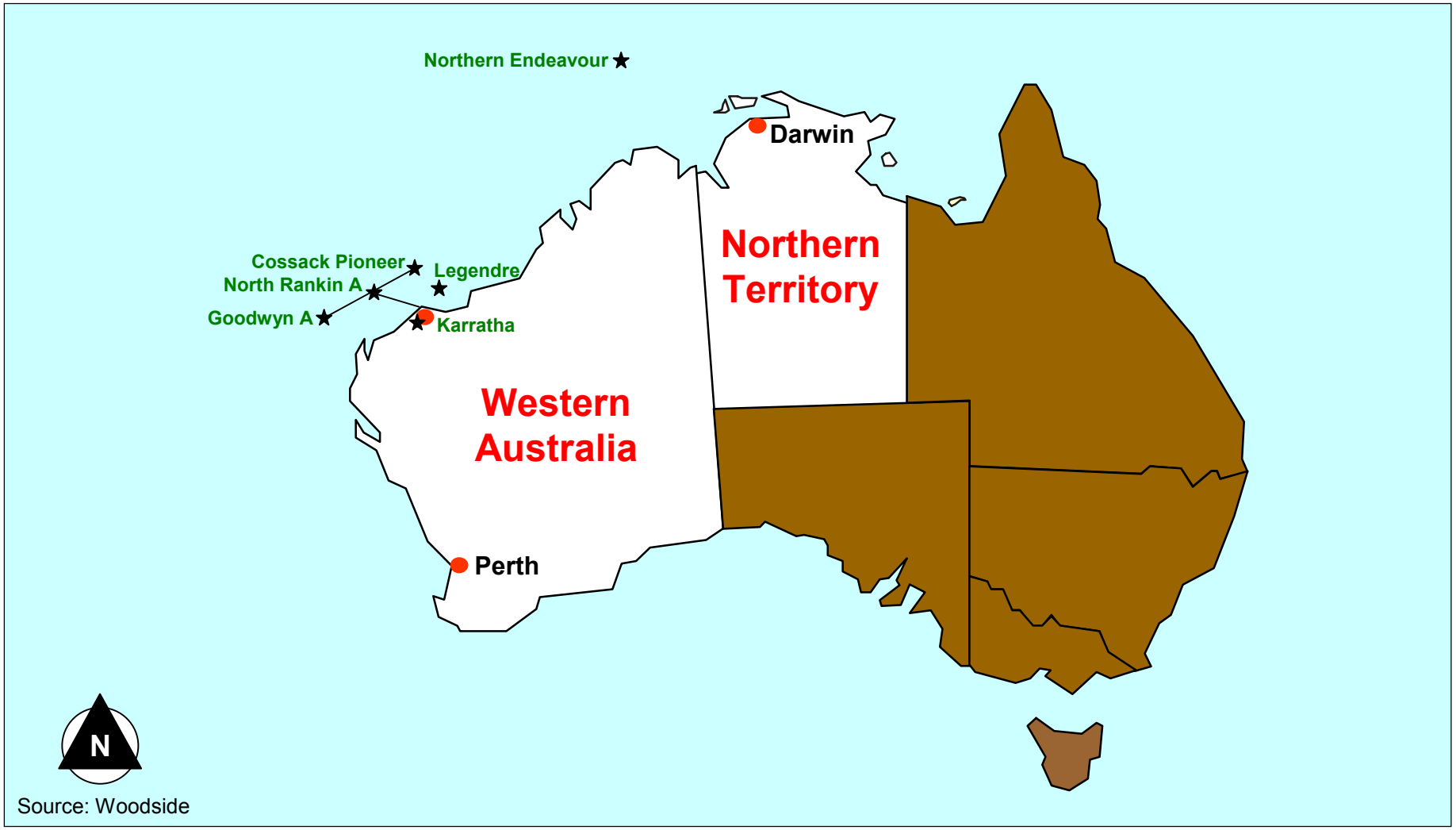
This EIS is focussed on the upstream field development of the gas fields known as Sunrise, which currently have a number of potential downstream customers. The two prime markets for Greater Sunrise gas are Onshore LNG (OLNG) plus other potential domestic customers and Floating LNG (FLNG). The variation in the needs of these customers in terms of gas supply requires that the design and development of the Sunrise Gas Field is able to accommodate gas supply to markets as they emerge. In effect the final design of the upstream field will reflect the downstream customer supply requirements. Therefore this EIS accommodates field development and pipeline infrastructure required to satisfy the markets available to the Sunrise Joint Venture. The final design will be accommodated within the environmental conditions determined in the environmental approvals process.

For clarity it should be recognised that both the OLNG and FLNG plants fall outside the scope of approvals, currently sought for the development of Greater Sunrise and the installation of associated pipelines. FLNG, OLNG and other gas customers will pursue individual environmental and other approval processes as may be appropriate.

To meet the processing and infrastructure requirements of the two prime potential markets, FLNG or onshore customers such as OLNG, the development of Greater Sunrise will entail a broad development with variations in processing and infrastructure requirements depending on which market prevails.

The infrastructure and processing requirements of the Greater Sunrise Gas Field are summarised below. The majority of these processing and infrastructure requirements are included in the scope of this EIS. Those that are not included are the subject of a separate approvals process such as the actual LNG processing plants (OLNG or FLNG).

- Greater Sunrise Field Development comprising:
  - production wells and wellstream gathering infrastructure (flowlines and risers),
  - a produced water re-injection well and infrastructure,
  - reservoir production management and wells control and services functions;
- Production Processing comprising:
  - supply of control and service functions to the Greater Sunrise Field Development,
  - reception and initial separation of the raw Sunrise wellstream into hydrocarbon and produced water streams,
- Infield Processing comprising processing together with appropriate storage and export of the wellstream hydrocarbons into transportable products for example:
  - OLNG comprising either two-phase hydrocarbon delivered by high pressure subsea pipeline to an onshore point of sale at OLNG Plant or further offshore processing to deliver salesgas (pipeline specification) to Darwin and condensate (tanker specification) to offshore points of sale; or
  - FLNG, comprising condensate (with options for additional products) exported from offshore points of sale.
  - Export pipeline comprising a high pressure subsea hydrocarbons pipeline from the Sunrise infield processing facilities to a Wye point along the proposed Bayu Undan pipeline to Wickham Point.



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Woodside's Existing Offshore Assets for Western Australia and Northern Territory

Figure 1-2
Project No.: DE2090.100
Figure prepared by: T.Lee
Date Prepared: 16/10/01

The above processing elements are necessarily supported by utilities, safety and support systems, living quarters and structures.

In the event of an OLNG option being selected, gas processing and metering requirements for Greater Sunrise gas which are not part of this EIS, will take place at an onshore plant such as the LNG Plant proposed by Phillips on Wickham Point Darwin.

The project schedule is presented in **Figure 1-3.** The following is a brief summary of the project schedule, which will be subject to confirmation of design concepts, the identification of suitable markets and agreement on acceptable commercial terms.

The Detailed Design phase of the project may commence in fourth quarter 2002 and will be completed by third quarter 2004. The post-design critical paths in the gas field development are likely to be:

- Fabrication and installation of wellhead platform and associated wells – expected to be completed by second quarter 2006. Drilling will commence more than 12 months before other facilities are installed in the field;
- Installing the Processing, Compression, Utilities and Quarters (PCUQ) substructures (platforms) - expected to be completed by first quarter 2006;
- Installing the PCUQ topsides - expected to be completed by first quarter 2006; and
- Construction of pipeline to connect to Bayu-Undan pipeline or to shore - expected to be completed by first quarter 2006.

By way of example, if current expectations are to be met production from the Greater Sunrise Field Development will commence when suitable gas markets have been established and approved by the appropriate regulatory bodies. This may be as early as Mid-2006, subject to agreement on all outstanding commercial and technical items.

1.6 Legislative Framework and Environmental Approval Process

1.6.1 Introduction

The Environmental Impact Assessment procedure is a formalised process designed to provide information to the regulatory authorities and the public about proposed developments with the potential to impact on the natural and social environment.

The Greater Sunrise Gas Field Development and construction and operation of a subsea pipeline is subject to two separate environmental assessment systems. In Australia all petroleum is the property of the Crown, with the Crown's position expressed in terms of sovereignty and sovereign rights rather than ownership. Offshore exploration and development beyond coastal waters (3 nm) are conducted under the *Petroleum (Submerged Lands) Act 1967*, which for Permit NT/RL2, is jointly administered by the NT and the Commonwealth governments.

The construction and operation of the Sunrise Gas Project therefore requires approval by the Commonwealth Government under the *Commonwealth Environment Protection (Impact of Proposals) Act 1974 (EPIP Act)* and Administrative Procedures. This Act and Procedures are administered by Environment Australia (Environment Protection Group).

As the Sunrise Gas Project, comprising the Greater Sunrise Field Development and associated pipelines, requires assessment under both the Northern Territory and the Commonwealth environmental assessment legislation, the two government bodies have agreed to facilitate a joint assessment. As such both the Minister for the Environment (Commonwealth) and the Minister for the Infrastructure, Planning and Environment (Northern Territory) (NT, DIPE) have set the level of assessment for the project as an EIS. Furthermore, both governments have agreed that the Environment and Heritage Division of the NT DIPE will take the lead role in the assessment process.

The final guidelines issued for the project reflect the recommendations of both governments. The final documentation will be assessed by each jurisdiction, with each government making its own decision.

1.6.2 Northern Territory Environmental Assessment Process

The Northern Territory Minister for Infrastructure Planning and Environment (the Minister) is responsible for administering the *Environmental Assessment Act 1982* and the *Environmental Assessment Act Administrative Procedures 1984,* under which the Act is implemented. A flow chart illustrating the Northern Territory and Commonwealth Government's assessment procedure is presented in **Figure 1-4.**

The Sunrise Gas Project was initially referred to the Minister by Woodside during the second half of 1999. Because the potential environmental impacts associated with the project were viewed as being significant, the level of assessment was set at an Environmental Impact Statement (EIS) and draft guidelines for assessment were issued. Following public review, final guidelines were released on 26 February 1999. The EIS guidelines were amended in August 2000 to reflect the change in project scope at the removal of onshore LNG Processing.

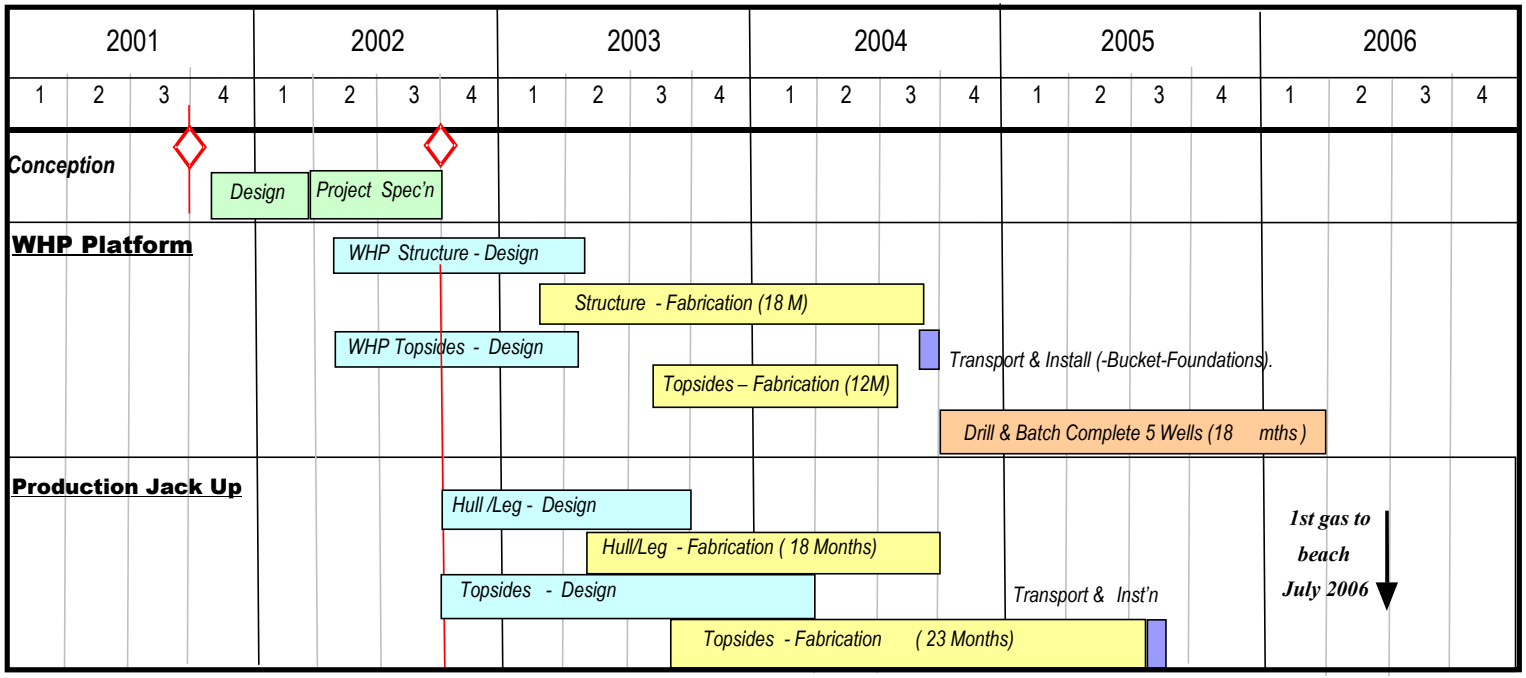
In accordance with the August 2000 guidelines, Woodside as the Proponent has prepared this Draft EIS and associated technical documents, which will be made available for public and government review and comment. In the Northern Territory the period for public review and comment on a draft EIS is a minimum of 28 days. During this period, the draft EIS will be circulated to advisory bodies for comment in relation to their areas of expertise and responsibility.

Following the review period, the Proponent will address the issues raised in submissions from advisory bodies and the public through the preparation of a Supplement to the draft EIS. The two documents, namely the draft EIS and Supplement to the draft EIS, make up the final EIS which is submitted to the Minister for circulation to the various advisory bodies for review and comment prior to decision on approval being made.

1.6.3 Commonwealth of Australia Environmental Assessment Process

The *Commonwealth Environment Protection (Impact of Proposals) Act 1974* (EPIP Act), has been superseded by *the Environment Protection and Biodiversity Conservation* Act *2000* (EPBC Act). However, as the Notice of Intent for the Sunrise Gas Project was submitted prior to the commencement of the EPBC Act on July 16 1999, the EPIP Act is still applicable through the provisions of the *Environmental Reform (Consequential Provisions) Act 1999*. This Act provides for the bridging period between the two Acts. The jurisdiction of the *EPIP Act* will cease if environmental documentation for the Sunrise Gas Project is not submitted by 17 July 2002.

Implementation of the EPIP Act is similar to that for the Northern Territory Government's assessment procedure as the latter was originally modelled on the EPIP Act. As with the Northern Territory *Environmental Assessment Act 1982*, the EPIP process was initiated by the submission of a Notice of Intent, which resulted in the Commonwealth Minister directing the Proponent to prepare a draft EIS to be available for public review for a minimum of 6 weeks. Copies of all public comments will be forwarded to the Proponent, together with comments by Government departments and agencies. As with the Northern Territory process, the final EIS will comprise the draft EIS with a supplement, which responds to the comments received during the public review. Following receipt of the final EIS, Environment Australia will examine the document and prepare an Environmental Assessment Report to the Environment Minister. The Environment Minister will then make comments, suggestions or recommendations to the action Minister (Minister for Industry, Tourism and Resources) on the environmental aspects of the proposal. The action Minister is required to take into account such comments, suggestions or recommendations in making a decision on the proposal.



WHP = Wellhead Platform

Source: Woodside

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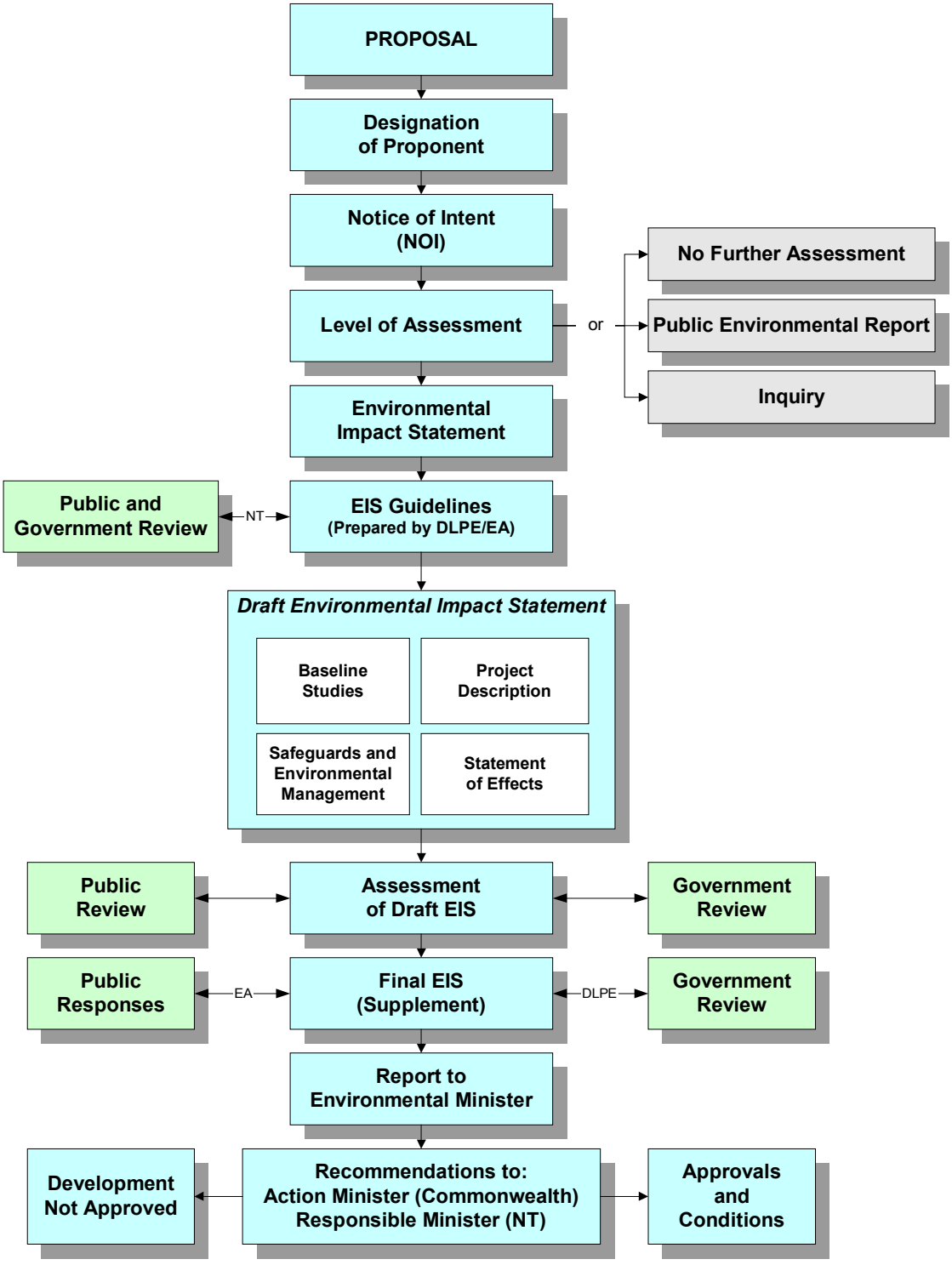
Indicative Project Schedule

Figure 1-3
Project No.: DE2090.100
Figure prepared by: T.Lee
Date Prepared: 16/10/01



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Northern Territory and Commonwealth Assessment Process

Figure 1-4
Project No.: DE2090.100
Figure prepared by: T.Lee
Date Prepared: 16/10/01

1.7 Relevant Legislation

1.7.1 Introduction

All activities associated with the proposal will comply with the legislative requirements established under a combined Territory and Commonwealth Government framework under which the Project will receive environmental, planning and development approvals and authorisations. To obtain a production licence and Foreign Investment Review Board approval, Woodside is required to assess the environmental impact of the proposed project under both Commonwealth and Territory legislation.

Under the Offshore Constitutional Settlement (OCS), Northern Territory coastal waters (within three nautical miles) fall under Territory jurisdiction with petroleum exploration and production activities administered by the NT Government under the *Northern Territory Petroleum (Submerged lands) Act 1982*.

However, the *Commonwealth Petroleum (Submerged Lands) Act 1967* controls exploration and production activities beyond coastal waters (greater than 3 nm) to the outer limit of the Australian Economic Zone (EEZ) at 200 nm. A joint authority formed between the Commonwealth Minister for Resources and Energy and the Territory Minister for Mines and Energy administers this Act. The NT Department of Business, Industries and Resource Development (DBIRD) is the Designated Authority to manage the approvals procedures. The *Petroleum (Submerged Lands) Acts Schedule of Specific Requirements as to Offshore Petroleum Exploration and Production in Waters under Commonwealth Jurisdiction 1997* has been produced by the NT and Commonwealth governments and, therefore both offshore activities are effectively regulated under the same Act, irrespective of whether they are located in NT or Commonwealth waters (Woodside, 2001(d)).

1.7.2 Northern Territory Legislation and Licence Requirements

Table 1-1 lists the known or possible Northern Territory legislative requirements, including licences and permits relevant to the proposed development.

1.7.3 Commonwealth of Australia Legislation and Licence Requirements

All activities conducted during the construction, operation and decommissioning of offshore elements will also be undertaken in accordance with the relevant Commonwealth legislation. Commonwealth legislation and licences that may be applicable to the Sunrise Gas Project are identified in **Table 1-2.**

The following acts were superseded following enactment of the EPBC Act, 1999:

- Environment Protection (Impact of Proposals) Act 1974.
- National Parks and Wildlife Conservation Act 1975.
- World Heritage Properties Conservation Act 1983.
- Whale Protection Act 1989; and
- Endangered Species Protection Act 1992.

Although the EPBC Act 1999 has repealed the *EPIP Act 1974*, this project is still designated under the *EPIP Act 1974* by virtue of the *Environmental Reform (Consequential Provisions) Act 1999,* which provides for the bridging period between the two Acts. Although most of the above-mentioned legislation is no longer valid, the EPBC Act 1999 incorporates many relevant aspects of the superseded legislation.

1.7.4 International Treaties and Obligations

One of the principal international agreements governing petroleum operations in both State and Commonwealth waters is the *United Nations Convention on the Law of the Sea, 1982 (UNCLOS)*. UNCLOS outlines a legal framework for marine environment protection. It imposes obligations on parties to prevent, reduce and control marine pollution from various pollution sources, for example,

from vessels, land and air. A system for the enforcement of national marine pollution laws was later introduced.

Other international agreements to which Australia is a signatory and which may impact on petroleum activities in both NT and Commonwealth waters, as well as onshore, include:

- *Framework Convention on Climate Change 1992 and Kyoto Protocol 1997* – the aim of which is to stabilise greenhouse gas concentrations to prevent interference with climate.
- *Timor Sea Arrangement*– see below.
- *International Convention on Civil Liability for Oil Pollution Damage 1969.*
- *International Convention on Oil Pollution Preparedness, Response and Cooperation 1990.*
- *International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties 1969.*
- *Protocol to International Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter 1972 (London Dumping Convention).*
- *Treaty Establishing an Exclusive Economic Zone Boundary and Certain Seabed Boundaries (1997)* – Signed in march 1997 this treaty covered three areas remaining for the maritime boundary delineation between Australia and Indonesia.
- *International Convention for the Protection of Pollution from Ships and Associated Protocols (MARPOL73/78) as implemented in Commonwealth waters through the Protection of the Sea (Prevention of Pollution from Ships) Act 1983.*
- *Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer.*
- *Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in danger of Extinction and their Environment – (Japan Australia Migratory Bird Agreement or JAMBA).*
- *Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (China - Australia Migratory Bird Agreement or CAMBA).*
- *Convention on Biological Diversity 1992.*
- *Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979.*
- *Convention on Wetlands of International Importance (Ramsar Convention) 1971.*

A number of the most pertinent treaties and obligations are summarised below.

Timor Sea Arrangement

At the time of the signing of the Seabed Agreement between Australia and Indonesia in 1972, East Timor was not part of Indonesia. Therefore in the area lying between East Timor and Australia there was a gap in the agreed boundary, which became known as the Timor Gap.

Following Australia's recognition of Indonesia's incorporation of East Timor, negotiations to resolve the Timor Gap boundary commenced. A decade of negotiations was closed with the signing of the Timor Gap Treaty in December 1989. The Treaty came into force in February 1991 and covers about 65,000 square kilometres.

The Treaty, which used the framework provided by the *1982 United Nations Convention on the Law of the Sea (UNCLOS),* allowed for the exploration and exploitation of the petroleum resources of the Gap. Where claims by Australia and Indonesia to the 200 nm exclusive economic zones overlapped, Zones of Cooperation (ZOC) to share the resources were established. The central zone, Area A (formed ZOCA), was jointly controlled by Indonesia and Australia. The southern zone, closer to Australia, was Area B, and controlled by Australia. The northern zone, Area C, is closer to East Timor and was controlled by Indonesia. The Treaty was a provisional agreement entered into for an initial term of 40 years.

Subsequently in July 2001, a Memorandum of Understanding (MoU) incorporating the 'Timor Sea Arrangement' was drawn up between Australia and UNATET, representing East Timor, to take effect upon East Timor's independence due in May 2002. This embodies the arrangements for the exploration and exploitation of the tentatively named 'Joint Petroleum Development Area' (JPDA) (superseding the Zone of Cooperation) pending a final delimitation of the seabed between Australia and East Timor. East Timor and Australia now jointly controls, manages and facilitates the exploration, development and exploitation of the petroleum resources of the JPDA.

Approximately twenty percent of the Greater Sunrise reserves lie within the JPDA, established between Australia and East Timor under the Timor Sea Arrangement. However, the production facilities (ie platforms) will be located within Australian waters and the Joint Authority, the JPDA regulatory authority, will comment on the EIS within the process outlined above.

In accordance with Annex E under Article 9 (b) of this Arrangement, East Timor and Australia agree to unitise the Sunrise and Troubadour deposits on the basis that 20% of the gas field lies within JPDA. The construction and operation of a pipeline within the JPDA for the purposes of exporting petroleum from the JPDA shall be subject to the approval of the Joint Commission.

The Timor Gap is administered by the Joint Authority, representing the Australian and East Timorese interest in the area. The Joint Authority is kept closely informed about the proponent's activities and is advised of progress toward the required environmental approvals.

Framework Convention on Climate Change

Australia's annual National Greenhouse Gas Inventory (NGGI) is supplemented by periodic State and Territory inventories. Each inventory is a database of human-induced greenhouse gas emission sources and sinks categorised into six sectors:

- Energy;
- Land Use Change & Forestry;
- Agriculture;
- Industrial Processes;
- Solvent & Other Product Use, and
- Waste.

The publication of inventories fulfils both an international commitment under the *Framework Convention on Climate Change*, and domestic requirements. The Inventory forms a baseline from which it is possible to identify trends and patterns in sectors and monitor response action.

Table 1-1 Northern Territory Licences and Permits

Licence Required	Legislation	Responsible Agency	Relevance
Possibly	*Northern Territory Petroleum (Submerged Lands) Act 1981*		Authorisation for construction and operation of a pipeline.
	Darwin Port Authority Act 1983		Consent regarding the use of the port and associated activities.
Authority Certificate	*NT Aboriginal Sacred Sites Act 1989.*	NT Aboriginal Areas Protection Authority	Undertake work or use land and manage impacts on Aboriginal sacred sites.
	Northern Territory Building Act 1993		
N/A	*Marine Pollution Act 1999*	DIPE - formerly Department of Transport and Works -Marine Branch	To protect the marine and coastal environment by minimising intentional and negligent discharges of ship sourced pollutants into coastal waters.
Management of Waste	*NT Waste Management and Pollution Control Act 2001*	DIPE	
Store and Possess Dangerous Goods	*NT Dangerous Goods Act 1996 & Regulations*	Work Health Authority	

Licence Required	Legislation	Responsible Agency	Relevance
	(1994)		
Waste disposal, mosquito control	*Public Health Noxious Trades Act 1982, Public Health Sanitation Regulations*	Territory Health Services	Requires refuse disposal to an approved engineered landfill and management of mosquito breeding.
	National Environment Protection Council (Northern Territory) Act 1994 & National Environment Protection (National Pollutant Inventory) Measure.	Environment & Heritage Division (DIPE)	National Pollution Inventory (NPI) - Industrial facilities are required to estimate and report annually their emissions of NPI listed substances.
	Territory Parks and Wildlife Conservation Act 1996		For interference with protected wildlife, parks and reserves.
	Waste Management and Pollution Control Act 1998 and Regulations		Provides legislation to ensure appropriate waste management
Ministerial consent to disturb Heritage Conservation Areas	*NT Heritage Conservation Act 1991*	DIPE	Consent from the Minister required to disturb sites of European, Aboriginal or Macassan occupations
Crown Property Lease or Licence	*NT Crown Lands Act 1992*	DIPE	Activities on land and in certain waters may require a permit of licence issued by Minister of DIPE.
Sea Dumping	*NT Environment Assessment Act 1982, NT Water Act 1992, Darwin Port Authority 1993*	DIPE with Darwin Port Authority	Allows the loading and disposal of specified waste and other material in Territory coastal waters (3 Nm)
Land Use Rezoning	*NT Planning Act 1993*	DIPE	Rezoning of land not appropriately zoned for its end-use.

Table 1-2 Commonwealth Legislation and Licences

Licence Required	Legislation	Responsible Agency	Relevance
Offshore Petroleum Pipeline Licence	*Commonwealth Petroleum (Submerged Lands) Act 1967 (ie. Beyond 3 nm)*	NT Dept of Mines & Energy (Energy Division)	Licence to allow the construction and operation of pipeline for transport of petroleum beyond 3nm
	Environment Protection (Impact of Proposals) Act 1974.		
	Australian Ballast Water Management Guidelines & Australian Quarantine and Inspection Services (AQIS) regulations.		Ballast water discharge into Australian territorial waters.
Environment Plan or HSE Case	*Petroleum (Submerged Lands) (Management of Environment) Regulations 1999;*		
	Petroleum (Submerged Lands) Act 1967; Petroleum (Submerged Lands) Acts Schedules.		Specific Requirements as to Offshore Petroleum Exploration and Production 1995 (regulates both State and Commonwealth activities). P(SL)A Schedule Clause 222 relates to the discharge of sewage/grey water & putrescible galley waste disposal.
Industrial Chemicals	*National Occupational Health & Safety Commission Act 1985*	Worksafe Australia	All industrial chemicals manufactured /imported into Australia must be assessed.
	Protection of the Sea (Prevention of Pollution from Ships) Act 1983 ie. MARPOL.		This Act may not be relevant.
Permit to Disturb or Recover Historic Shipwrecks or Relics	*Commonwealth Historic Shipwrecks Act 1976*	Dept of Communications & the Arts (Heritage Protection Section)	Permit is required for disturbance or recovery of shipwrecks.
Permit to undertake Prohibited Activity in Protected Zones	*Commonwealth Historic Shipwrecks Act 1976*	Dept of Communications & the Arts (Heritage Protection Section)	Permit required to conduct activities within a protected zone – specified radius around wrecks.
Approval & notification required for activities in Naval Waters in Darwin Harbour	*Control of Naval Waters Act 1918*	Dept of Defence	Notification required for activities in naval waters to Commanding Officer, HMAS Coonawarra, Darwin
	Australian Maritime Safety Authority Act 1990		Minimise interference with shipping traffic and recreational vessels
	Aboriginal and Torres Strait Islander Heritage Protection Act 1984		If the proposal is likely to interfere with significant Aboriginal or Torres Strait Islander Areas and any party is disaffected with the Territory legislative process.
Agreement with Traditional Owners	*Aboriginal Land Rights Act 1976*		If the proposal is likely to impact on any extant or claimed native title interests. If the proposed development is likely to encroach on any Aboriginal lands (claimed or awarded).
	Civil Aviation Safety Authority Act		
	Hazardous Waste (Regulation of Exports and Imports) Act 1989		
	Native Title Act 1993		
	Ozone Protection Act 1989		
	Wildlife Protection (Regulation of Exports and Imports) Act 1982		
	Australian Heritage Commission Act 1975		If the proposal is likely to impact on any place entered on the Register of the National Estate.
	Protection of Movable Cultural Heritage Act 1986		
	Air Services Act 1995		

Kyoto Protocol
In 1998, Australia signed the Kyoto Protocol, a set of binding targets for industrialised countries to reduce the emission of greenhouse gases. Australia is yet to ratify the Kyoto Protocol, after which the greenhouse targets become legally binding. If ratified, Australia's target will require limiting the growth of greenhouse gas emissions to 8% above 1990 levels by 2008-12.

JAMBA & CAMBA
In accordance with JAMBA and CAMBA, the governments of Australia, Japan and the People's Republic of China have agreed to protect migratory birds and their important habitats by:

- Preserving and enhancing important habitat used by migratory birds listed in the agreement;
- Encouraging joint research programmes and sharing the information gained;
- Establishing sanctuaries and other facilities for the management and protection of migratory birds and their habitats;
- Preventing damage to migratory birds and their habitats, and encouraging their conservation;
- Meeting regularly to report on progress and develop new initiatives; and
- Generally prohibiting the removal, sale, purchase or exchange of migratory birds and their eggs.

1.8 Land Use Planning

While not part of the scope of this EIS, land use planning is relevant in the context of the provision of gas to shore. The landfall for gas, in accordance with the Phillips proposal for onshore LNG production, is Wickham Point on the Middle Arm Peninsula.

Middle Arm Peninsula lies within the Shire of Litchfield and the primary NT Planning Scheme document of relevance is the "*Proposed Litchfield Planning Concepts and Land Use Objectives, 2001*". This document recognises the Middle Arm Peninsula, with its deep water access and proximity to port and urban infrastructure, as suitable for major industrial development.

The above-mentioned document is currently the subject of the processes of the *Planning Act (NT) 1999* and will form the basis for amendments to the NT Planning Scheme. When approved, this document will become an "incorporated document" and will provide for amended "development provisions" pursuant to the Act.

1.9 EIS Scope and Structure

The EIS is structured on the guidelines issued in response to the Notice of Intent (NOI) submitted by Woodside (as operator of the Sunrise Gas Project) to the NT Government (Department of Infrastructure, Planning and Environment) and the Federal Government (Environment Australia) seeking the determination of the required level of environmental assessment for the Sunrise Gas Project (refer to **Appendix A**). At that time, the scope of the project included the offshore field development, a trunkline from Sunrise to Darwin and the establishment of an LNG facility at Glyde Point. In August 2000, the NOI and EIS guidelines were amended to exclude the onshore LNG plant, but maintained the option of either onshore or offshore gas processing, condensate and LPG removal at Glyde Point. The trunkline route was confirmed as a Shoal Bay landfall with an onshore section to Glyde Point. The scope of the EIS no longer includes facilities at Glyde Point, shore approaches at Shoal Bay or access corridors to Gunn Point. The items which were included in the original NOI and which have now been excluded from the current EIS comprise:

- Construction and operation of a domestic gas processing plant at Glyde Point and supply pipeline from Glyde Point to the existing gas network;
- A jetty for loading of products for export;
- LNG Processing Plant & Storage Tanks;
- Onshore power generation facilities;
- Loading jetty for LNG ships;

- Rock quarry;
- Construction camp;
- Utilities provision; and
- Service corridor for onshore gas pipeline

As discussed, the two potential scenarios are under consideration for the Greater Sunrise Field Development and comprise:

- Option One – a combination of subsea and/or Wellhead Platform (WHP) Wells with gas and condensate processing by way of offshore processing, storage, export, utilities and quarters facilities. Under this option, gas and condensate would be exported to Darwin via an export pipeline to the proposed Darwin LNG facility.
- Option Two - a combination of subsea and WHP wells, with gas and condensate exported to a Floating LNG (FLNG) facility via a series of flowlines and risers. Under this option produced formation water including production chemicals may be transferred from the FLNG back to the field for re-injection.

For clarity it should be recognised that both the OLNG and FLNG plants fall outside the scope of approvals currently sought for the development of the Greater Sunrise gas fields and the installation of associated pipelines. FLNG, OLNG and other gas customers will pursue individual environmental and other approval processes.

The scope of this EIS therefore comprises the following major components:

- Offshore production facilities including production wells, subsea infrastructure and offshore processing, storage, export, utilities and quarters facilities (fixed and/or floating platform structures); and
- Export gas pipeline from the Greater Sunrise Field to a tie in point, known as the Wye, to the Phillips Bayu-Undan pipeline which is proposed to go from the Bayu Undan gas field to Wickham point .

Furthermore, proposals to establish industrial estates at Middle Arm and Glyde Point and service corridors to connect both estates to the gas supply at Wickham Point, are the subject of separate environmental assessments initiated by the NT Government.

The EIS scope for both OLNG and FLNG scenarios are discussed further in **Chapter 3** and illustrated in **Figures 3-1a** and **3-1b**, respectively.

The EIS includes the following main chapters:

Executive Summary

Chapter 1: Introduction
Chapter 1 serves as an introduction to the project providing information on the background to the project, the Proponent, legislation, lead-in studies and planning issues.

Chapter 2: Objectives and Benefits
Chapter 2 discusses the objectives and benefits of the proposal with socio-economic, production and environmental objectives detailed and as such justifies the need for the project.

Chapter 3: Description of Design and Construction Phases
Chapter 3 is concerned with the Project Description of offshore facilities and the associated pipeline. This chapter examines installation and construction procedures where appropriate. It considers the pipeline system and deals with aspects associated with the operation of the pipeline.

Chapter 4: Description of Operation and Decommissioning Phases
The operation, maintenance and decommissioning of the offshore facility and export pipeline are described in this chapter.

Chapter 5: Alternatives
In line with EIS requirements, various types of alternatives are discussed in Chapter 5 including alternative pipeline routes, platform locations and the 'Do Nothing Scenario'. The pipeline route selection process is also described, including a summary of the environmental and engineering factors that lead to selection of the final route.

Chapter 6: Existing Environment
Chapter 6 describes the Existing Environment prior to construction, with an outline of the baseline studies conducted. A detailed description of the Physical, Biological, and Cultural environment is provided.

Chapter 7: Socio-Economic Environment
Chapter 7 provides information on the socio-economic environment of the region. Included is information on the transport system, accommodation facilities, demographics etc.

Chapter 8: Environmental Impacts and Mitigation Measures
Chapter 8 discusses the predicted and possible impacts. The chapter also describes the mitigation measures proposed in order to eliminate or reduce impacts resulting during the different phases of the project. A summary of the hazard analysis undertaken to date is provided in this section also.

Chapter 9: Draft Environmental Management Plan
The Draft Environmental Management Plan (EMP) provides a framework for environmental management, as specified in the DIPE Guidelines. Proposed monitoring programmes and reporting arrangements are also outlined. Proponent's obligations are outlined at the end of this Chapter.

Chapter 10: Public Involvement and Consultation
Chapter11 summarises the strategy implemented to ensure the community were given the opportunity to receive detailed information on the project and provide their feedback on any issues or concerns they may have.

Information sources, glossary and appendices providing detailed and technical data are included at the back of the report.