The Shell Company of Australia Limited

Vic/P19 Evaluation

Part 2

Field Development Alternatives & Costs

RISC

September 1998

Strictly Confidential

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SDA Facilities Engineering Cover Note for:

Vic/P19 Evaluation Part II, Field Development Alternatives & Costs, Dated September 1998, Published by Resource Investment Strategy Consultants Pty. Ltd.

Purpose of Cover Note

The purpose of this cover note is to formally record the SDA (Shell Development Australia) facilities engineering view on the above report, and, where SDA's view differs from RISC's ("Resource Investment Strategy Consultants"), to document the difference.

Introduction

As stated in the introduction to RISC's report, SDA and RISC worked closely throughout the study. Consequently accepts the great majority of the report (concepts and costs) as a sound basis for screening the oil and gas resources of Vic P19.

The only important area where SDA's view differs from RISC's is on well costs.

SDA vs. RISC Well Costs

During the study RISC agreed that the well costs they quoted were likely to represent cheapest achievable wells, rather than a realistic average cost per well during an appraisal and field development drilling campaign. This was recognised in section 4.0 by the statement:

> (Quote) "*Consequently, whilst the costs presented for drilling are considered to be credible performance targets, the accuracy range could be considered to be more in the range -10% +50%.*" (Unquote).

Therefore, SDA prepared their own drilling cost estimates, which were generally about 45% higher than RISC's. As a result, for input to economic evaluations, the RISC well cost estimates were all multiplied by the factor 1.45.

The SDA cost estimates were prepared with input from drilling department, and were based on SDA's current contract for the Ocean Bounty.
Assumptions, calculations and comparison with the RISC costs are shown in attachment 1.

Signed

C Spencer

Chris Spencer
SDA-UTF/3

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This is an enclosure indicator page.

The page that follows this page is an uncatalogued fold-out with page number:

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and is enclosed within the document PE801824 at this page.

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RISC STUDY

Declaration

Shell Development (Australia) Pty Ltd ("Shell") has commissioned Resource Investment Strategy Consultants, RISC Pty Ltd ("RISC") to confidentially evaluate selected technical information supplied by Shell in order to provide reservoir and facility engineering services in support of Shell's ongoing management of its interest in Vic/P19. Neither RISC Pty Ltd nor its employees has any pecuniary interest or other interest in relation to the asset other than to the extent of the professional fees receivable for providing services to Shell.

The statements and opinions attributable to us are given in good faith and in the belief that such statements are neither false nor misleading. In carrying out our tasks, we have considered and relied upon information provided by Shell. While every effort has been made to verify data and resolve apparent inconsistencies, neither RISC nor its servants accept any liability for its accuracy, nor do we warrant that our enquiries have revealed all of the matters which an extensive examination should disclose, particularly where we have reason to believe that material facts have not been supplied to us.

We believe our evaluation and conclusions are sound but no warranty of accuracy or reliability is given.

Our review was carried out only for the purpose referred to above and may not have relevance in other contexts.

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Executive Summary

Resource Investment Strategy Consultants, RISC Pty Ltd ("RISC") were commissioned by Shell Development (Australia) Pty Ltd ("Shell") to provide assistance in evaluating field development options and associated costs for development of the VIC/P19 resources.

RISC has worked in conjunction with Shell technical staff to develop, at a screening level, an evaluation of various field development concepts that could be employed to exploit, either separately or in an integrated manner, the oil and gas resources of VIC/P19 (Basker, Manta and Gummy).

Against the background of a range of possible development scenarios for the oil and gas resources associated with Basker, Manta and Gummy - standalone or satellite development, separate or integrated oil and gas development, alternate gas market scenarios - there are a large number potential export route options and associated alternate facility concepts.

The evaluation is predicated on the assumption that Kipper would be developed by way of a subsea development producing raw gas products to an onshore plant at Orbost, and that there is no solution for economic development of Kipper oil alone. Further, and under this scenario, the point of access into the gas market is assumed to be at Longford, and hence there is requirement for a 150km pipeline between Orbost and Longford.

In addition to options for export through a possible Kipper development, alternate export routes via the nearby ESSO/BHPP platforms or directly to the shore were assessed. The alternate development concepts addressed included leased and project owned Floating Production Storage & Loading (FPSO) and wellhead platform or subsea satellite options for oil development, and wellhead / process platform or subsea satellite concepts for gas only or integrated oil and gas development scenarios.

Mindful of the objectives of this study, it was not appropriate to explicitly evaluate each of the possible combinations of export routes and concepts by way of determining respective development costs and undertaking economic analysis for each. Therefore, an approach was adopted whereby competing concepts where screened out on a semi quantitative basis leaving only a few key concepts to be addressed in more detail.

This process identified the following generic concepts which are expected to deliver the lowest life cycle unit costs and which have no reliance on existing developed infrastructure:-

- oil only - leased FPSO.
- gas only - subsea gas satellite to a Kipper subsea facility.
- oil and gas - leased FPSO preceding a subsea gas development (as a satellite to Kipper) which employs maximum re-use of oil development wells and production facilities.

These selected concepts were then used as the basis for addressing a range of standalone and integrated development scenarios and alternate gas market scenarios.

The basis for developing costs estimates has been drawn largely from data provided in relation to the various Retention Lease Applications submitted for both VIC/P19 and VIC/RL2. Where relevant data was not available from the above referenced material, RISC has employed its own databases and associated cost engineering models in conjunction with any similarly relevant information available from Shell.

All costs, with the exception of those explicitly discussed below, are considered to represent "P50" (or 50/50) values and by definition include a measure of contingency. Because of the extent of relevant and recent benchmarking data available, it is suggested that the costs developed for this study could be

considered to have a "P85"/"P15" accuracy range of the order of -20% to +30%, *for the scopes defined for each case presented*, with the exception of drilling costs and leased / low cost FPSOs, where a "best practice / bullish view" has been adopted.

In summary, capital costs under the base gas market scenario and subsea developments for standalone development of Manta/Gummy and Kipper each with dedicated offshore export and onshore processing / export amount to ~A$580million and ~A$510million respectively including appraisal, or a total of A$1090million. On an integrated basis where export and processing infrastructure is shared in some way, the total capital costs for development of both assets is estimated to be ~A$800million of which A$285million relates to Manta/Gummy (tied back to Kipper), ~A$140million is required for Kipper (excluding export etc.), and A$375million relates to the export / processing system from Kipper to Longford. The capital saving across the two assets through integration is therefore of the order of A$300million.

For the oil development scenarios, the total capital cost for development of Basker / Manta is estimated to be ~A$120million and ~A$210million respectively for leased or project owned FPSOs, inclusive of appraisal. The respective peak annual operating costs amount to A$50million and A$20million. This compares to an estimated capital cost for development of Basker / Manta as a subsea satellite to Tuna of ~A$220million and peak annual operating cost of A$9million, excluding tariffs. Although the capital cost estimate includes provision for the addition of a process module on Tuna, tariffs for the export / compression of oil and gas would be raised - nominal estimates for such tariffs are A$1.50/bbl and A$0.60/GJ at minimum.

In terms of gas development options, the target production start-ups are driven by views of the gas market. For all gas market scenarios, it is presumed that Kipper would be developed first followed by Manta / Gummy. The earliest market opportunity for Kipper is envisaged to occur in the year 2002 and against the background of Kipper's present status, development and start-up by early 2002 is considered quite achievable.

For the Manta / Gummy gas development scenarios, and assuming market opportunities emerge (following Kipper) in 2005, appraisal and project definition would need to be completed by end 2002 with Prime Scope Approval (PSA) occurring in early 2003.

Under the scenario where an integrated development with Kipper is contemplated, then in order for common export / processing systems to be adequately defined and commercial arrangements put in place, an earlier completion of Manta / Gummy appraisal would be required prior to the Kipper development PSA assumed to be early 2000. For this to be achieved, at least one appraisal well would need to be drilled early - mid 1999 irrespective of the timing of a later Manta / Gummy development.

For oil development, an aggressive schedule can be envisaged which requires an appraisal well to be drilled in Basker in early 1999 in order to achieve completion of project definition and PSA by January 2000. This then allows a period of 12 months for the procurement and installation of equipment and contracting of a leased FPSO. Certain items, including for example flexible flowlines and subsea xmas trees will be critical path perhaps requiring order placement prior to PSA. The highest schedule risk associated with this scenario is of course the securing of a suitable FPSO. Since the economics of any development employing an FPSO will almost certainly rely on securing a vessel at a low day rate, this development within the above timeframe may well not be achievable simply because a suitable vessel is not available on the market.

1.0 Introduction

Resource Investment Strategy Consultants, RISC Pty Ltd ("RISC") were commissioned by Shell Development (Australia) Pty Ltd ("Shell") to provide assistance in evaluating field development options and associated costs for development of the VIC/P19 resources.

RISC has worked in conjunction with Shell technical staff to develop, at a screening level, an evaluation of various field develop concepts that could be employed to exploit, either separately or in an integrated manner, the oil and gas resources of VIC/P19 (Basker, Manta and Gummy). The field development concepts have been optimised as far is prudent to do so at a screening level with regard to subsurface and facility development scenarios. For gas, a number of alternate gas marketing scenarios were also considered.

Because of the potential high degree of synergy that exists between VIC/RL2 resources (Kipper) and the VIC/P19 resources, it has been necessary to not only assess development costs of Kipper, but also to define the facility scopes and costs associated with shared or common infrastructure that might be jointly employed to exploit the VIC/RL2 and VIC/P19 resources.

This report documents the full range alternative development concepts considered, the outline functional specifications and costs defined for a representative set of development scenarios (facility concepts, reserve ranges and gas marketing scenarios), and provides a comprehensive set of economic modelling inputs in the form of phased activity, production and cost data sheets.

2.0 Development Concepts

Against the background of a range of possible development scenarios for the oil and gas resources associated with Basker, Manta and Gummy - standalone or satellite development, separate or integrated oil and gas development, alternate gas market scenarios - there are a large number potential export route options and associated alternate facility concepts. A set of plausible field development options, as a function of export routes and facility concepts were defined and are depicted in Figure 2.1. These are predicated on the assumption that Kipper would be developed by way of a subsea development producing raw gas products to an onshore plant at Orbost, and that there is no solution for economic development of Kipper oil alone. Further, the point of access into the gas market is assumed to be at Longford, and hence a 150km pipeline between Orbost and Longford is provided for in all cases.

In defining the export route options, the following assumptions have been made and, in regards to options for tie-in to ESSO/BHPP infrastructure, are based on informal discussions held between ESSO and SDA:-

<u>Tuna platform, ~29km from Basker</u>

This represents the most suitable option for tie-in to the existing Esso/BHPP infrastructure. The platform is understood to have some spare topsides carrying capacity and is considered capable of accommodating either or both of:-

- a small oil separation / metering skid and water injection package suitable for a Basker / Manta oil development (associated gas assumed to be compressed using the existing Tuna gas lift / export gas compression plant), and
- a gas / condensate separation and export gas compression module for handling gas production from a (Basker) / Manta / Gummy gas development
  (whilst there may be some scope for utilising existing plant to provide the key functions outlined above, this potential has not been assessed as part of this study)

Flounder and West Tuna platforms

- although closer to the Vic/P19 fields, the Flounder platform is not believed to have any spare topsides carrying capacity.
- the West Tuna platform is thought to have greater additional topsides carrying capacity, but is any event, more distant from the Vic/P19 fields and does not have a gas export pipeline

Export to Kipper, ~15km

- predicated on Kipper being developed as a subsea facility exporting raw wellhead gas 55km to a greenfields gas plant at Orbost; this option is only relevant for gas export.

Export directly to shore, ~70km

- assumes a gas plant located at Orbost adjacent to or integrated with a Kipper plant; export to shore is only felt to be a practical option for gas export.

In summary, the alternate concept options consist of FPSO and wellhead platform or subsea satellite options for oil development, and wellhead / process platform or subsea satellite concepts for gas only or integrated oil and gas development scenarios. Mindful of the objectives of this study, it was not appropriate to explicitly evaluate each of these concepts by way of determining respective development costs and undertaking economic analysis for each. Therefore, an approach was adopted whereby competing concepts where screened out on a semi quantitative basis leaving only a few key concepts to be addressed in more detail.

2.1 Base Case Concepts

On the basis of comparable project comparisons and intuition, the following concepts which are expected to deliver the lowest life cycle unit costs and which have no reliance on existing developed infrastructure, were selected as a base case for standalone and integrated development scenarios:-

- oil only - leased FPSO.
- gas only - subsea gas satellite to a Kipper subsea facility.
- oil and gas - leased FPSO preceding a subsea gas development (as a satellite to Kipper) which employs maximum re-use of oil development wells and production facilities.

These concepts, along with any relevant technical comments, are summarised briefly below. Notional field layouts based on the P50 reserves cases, configured to provide for both standalone Basker / Manta oil development or integrated oil / gas development scenarios, are indicated in Figures 2.2 and 2.3.

Oil Only - Leased FPSO

This concept represents a simple subsea / FPSO combination with either well cluster(s) or single wells located over Basker / Manta with individual flowlines tied back to turret moored FPSO. For the P50 reserves case, 2 production wells and a gas injection well are located in a cluster over Basker, whereas only a single production well is required for Manta. Some of the more specific assumptions are:-

- wellheads located outside of required clearance radius of a moored FPSO and offtake tanker so as to allow concurrent production and drilling operations as required.
- principal objective is to minimise flowlines lengths so as to minimise fluid temperature drop (and hence wax formation potential).
  - in the case of the Manta well (s), the notional wellhead location provides an ability for subsequent re-entry, sidetrack, completion and tie-back to a combined Manta / Gummy gas production manifold for a gas development.
  - minimising flowline lengths comes at the expense of higher drilling costs; some scope for optimisation may exist, but extending flowline lengths will tend to

exacerbate wax formation management (temperature drop, and movability in the event of static wax formation conditions).

- wellheads located adjacent to each other so as to allow for a simple cross-over facility between wellhead flowline connection so as to offer the opportunity to circulate flowline contents in the event of wax formation or line flushing requirements; in the case of Manta, twin flowlines are assumed even for a single well so as to provide for the ability to flush line contents in case of wax build-up.
- gas compression on FPSO for gas injection of associated gas production, after fuel and flare requirements, to a single gas injection well and to each production well annulus via a small diameter control umbilical core (or separate flowline to each cluster) to provide for gas kick-off.

The general concept proposed for this scenario is well proven worldwide although specific technical issues relating to an application for Basker / Manta are:-

- wax formation will present some operational challenges although these are not considered unsurmountable.
- gas injection will require a high pressure swivel, technology for which is considered available and adequately proven today.

In estimating costs, a number of assumptions were made with respect to the FPSO which must be considered to represent an optimistic scenario. Specifically, these were:-

- an already converted and operating FPSO suited to the Basker / Manta requirements becomes available for sale.
- sale price is commensurate with such a vessel having only limited remaining years of practical operating life.
- beyond minor refurbishment and minimal mooring modifications, only gas compression equipment has to be added.
- such a vessel is already equipped with crude heating / cargo tank circulation systems.

If the economics for an oil only development, under the above scenario, were to appear favourable then a more rigorous assessment of these assumptions and confirmation of the attendant cost implications through market enquiries would be required.

<u>Gas Only - Subsea tie-back (to Kipper subsea facility)</u>

For this scenario, a single well cluster / manifold would be located between Manta and Gummy which for the cases addressed require up to 6 - 8 wells; conceptually, gas from Basker (following oil depletion and gas injection) could also be produced and tied back into this manifold. Each well would be connected by short jumpers to a "daisy chain" style manifold (capable of expansion to handle additional wells as required). The use of a carbon steel export pipeline, assumed to be the basis for the Kipper - Orbost pipeline, will most likely necessitate wellhead cooling through the use of subsea duplex heat exchangers between the wellheads and the manifold in order to reduce pipeline corrosion to an acceptable level; this is essentially the way in which the East Spar gas field has been developed. Other features of this scenario are:-

- well and manifold control functions and chemical injection capability provided by a locally moored Navigation Control and Communication (NCC) buoy, again also as per East Spar.
  - extension of Kipper control system not assumed to be practical unless this too is founded on the use of a local NCC buoy or equivalent.

- export by carbon steel pipeline of raw wellhead fluids 15km to a tee connection at the Kipper manifold.
  - sizing of the pipeline and reservoir production potential have been defined so as to not impact on the Kipper production potential.
  - cost allowances have also been made to increase the size of the Kipper to Orbost pipeline and onshore plant, again so as not to compromise Kipper production potential.
  - corrosion inhibitor and hydrate depressant chemicals injected on a continuous basis.

This concept is extremely analogous to that of the East Spar gas development off North West Australia and the application of a similar concept to development of Manta and Gummy is therefore considered valid; some technical aspects are, however, worth noting.

- one of the notional Manta well locations results in a substantial horizontal departure and consequential high well cost if the wellhead were to be located adjacent to the manifold; tie-back, on a life cycle cost basis, may prove to be more cost effective through the use of a 2 - 3km flowline.
- seabed temperatures are substantially lower than those in the East Spar area, hence higher hydrate inhibitor (MEG, DEG or TEG) concentrations will be required; in the event that storage volumes required for an NCC buoy concept become unmanageable, then supply from onshore via a separate small diameter pipeline may be required - overall project cost impact not expected to be significant.

Kipper - Orbost - Longford export / processing system

This system would essentially comprise an offshore pipeline to an onshore gas plant at Orbost, and an onshore pipeline connection to Longford.

Depending on the selected gas market scenario, the offshore / onshore Kipper - Orbost pipeline, ~ 55km, is estimated to range from 20" to 26" to satisfy sales gas MDQs of 155TJ/d to 310TJ/d (40PJ/yr to 80PJ/yr ACQ); similarly the Orbost - Longford pipeline size ranges form 14" to 18".

Assumptions regarding the onshore plant are as follows:-

- the Orbost gas plant is presumed to include CO2 removal, LPG extraction, gas dehydration and export compression.
- compression requirements (compression ratio / timing) have been defined as a function of the required capacity(s) / production potential(s) over the peak delivery period; compression is envisaged to be installed in two stages where the first installation provides for up to 3:1compression ratio from "day 1" with a second stage installation providing for a total 9:1 where timing is driven be field production potential requirements.
- principal system operating pressure assumptions are:-
  - 900psi / 800psi minimum offshore pipeline entry (Kipper) / outlet (Orbost) pressures with 3:1 onshore compression; 550psi / 385psi with 9:1 onshore compression.
  - 2100psi / 1500psi normal onshore pipeline entry (Orbost) / delivery (Longford) pressures.
  - onshore plant system pressure drop assumed to increase from 100psi to 150psi over the peak delivery period.

2.2 Alternate Development Concept Screening

The following outlines in brief the key issues associated with the various alternate development concepts and associated options. Where possible, the rationales at a qualitative level for elimination of options are identified. Costs have been used as the principal criteria where the reference cases are those associated with a leased FPSO for an oil only development and a subsea tie-back to a subsea Kipper facility for a gas only development.

<u>Oil only</u>

Project owned FPSO

- only on the basis that a project owned FPSO can be implemented for similar capital costs, plus a component of project management, to those defined for determining a leased FPSO day rate, then a project owned option may be more attractive given more than three or four years service.
- downside of project owned solution is exposure compared to that of a leased option in the event of a shorter than planned field life.
- nevertheless, this option warrants economic assessment to determine whether the substantial shift from an operating cost intensive scenario under a leased arrangement to a capital intensive scenario is likely to be more attractive.

Subsea tie-back to Tuna

- subject to satisfactory resolution of wax formation management issues over ~29km flowline, a subsea tie-back to Tuna may offer lower capital costs compared to a project owned FPSO and certainly lower direct operating costs, although there is exposure to tariffs from Esso/BHPP being offered at too high a level.
- downside of this solution is exposure high levels of capital investment (compared to that of a leased FPSO option) in the event of a shorter than planned field life.
- upside is that produced gas can be exported to add value with field pressure maintenance being provided through water injection; the latter also slightly improves reservoir production performance.
- option should be retained for specific economic analysis.

Wellhead platform tie-back to Tuna

- same issues as identified for subsea tie-back.
- however, water depths over Manta and Basker range from ~130m to ~250m and even at the shallower depths, the cost of a wellhead platform will be prohibitive.
- furthermore, it is highly unlikely that jack-up drilling would be either technically possible or cost effective, assuming that a platform were to be located in shallower water depths to the north of the fields.
- consequently, wells could only be drilled through the use of a tender assisted or fully integrated platform drilling system, both of which would almost certainly not be cost effective for this application.
- despite some possible benefits (access, maintenance etc.) in surface completed wells, a wellhead platform option does not appear to offer any overall benefit over a subsea completed well system.

Gas only

Integrated well and process platform with gas export to Tuna, Kipper or shore (Orbost)

- given a similar well number requirement for a gas development as for an oil development, there is likewise considered to be no possible benefit in surface completed wells.
- considering only manifolding requirements and the requirement for wellhead fluid cooling prior to entry into a carbon steel export pipeline, again the subsea alternative is considered to be more cost effective than an equivalent platform based solution in these water depths.
- as far as providing process facilities for gas export, either on a floating or fixed platform, this option is unlikely to have any worth for the following reasons.
    - export of treated and compressed gas to a subsea Kipper facility would serve no benefit since this gas would then be blended with "wet" raw Kipper gas and be subject to Kipper export pipeline operating pressure constraints.
        - this is on the basis that the potential for substantial water break through is considered minimal.
    - Esso/BHPP operate a wet gas export system, and hence there would be no benefit in dehydrating gas, therefore the only possible processing function would be compression.
        - since the cost of installing a separate production gathering and compression platform would substantially exceed the equivalent cost of the alternative subsea gathering system and compression module addition at Tuna, this option would not appear to be attractive (tariffs for subsea or platform options would be similar).
        - furthermore, it is understood that additional pipeline capacity from Tuna to Marlin would required through looping.
    - when considering the penalty of a dedicated pipeline (albeit a line of smaller diameter given offshore compression) to shore and the incremental cost of placing a process platform with dehydration and compression offshore compared with providing a plant with equivalent requirements onshore, it is highly unlikely that this would result in a lower overall life cycle cost than the subsea tie-back option to Kipper.

Subsea tie-back to Tuna or shore (Orbost)

- this concept would be almost identical to that for a tie-back to Kipper excepting that in both instances capital costs would be greater.
    - whilst the distance to Tuna, ~29km, is greater than that to Kipper, ~15km, resulting in higher cost, it is unlikely that the tariff that may be levied by Esso/BHPP would be any less than that required to export through Kipper - Orbost, especially since additional Tuna to Marline pipeline capacity would be required; further, it is likely that export through Esso/BHPP would be later than that which could be achieved through Kipper or direct to the shore.
    - export to the shore directly would potentially allow an earlier gas market entry but this would be at the expense of the cost of a dedicated pipeline ~70km to shore rather than just 15km to Kipper; any timing benefit would be unlikely to cover the incremental cost of the pipeline, but may also frustrate the opportunity to share an onshore plant with Kipper resulting in still higher costs.

Wellhead platform tie-back to Tuna or shore (Orbost)

- as per reasons discussed for other options (ie. “oil only” or integrated well / process platform “gas only”), there is perceived to be no benefit in a wellhead tower compared to the subsea alternate.

Oil + Gas

Integrated oil and gas development scenarios are predicated on the basis of oil development ahead of gas, or possibly simultaneously. Conceptually, sequential development of oil followed by gas would allow the maximum opportunity to reuse wells and facilities through adopting the optimum development concepts for “oil only” and “gas only”, ie. leased FPSO for oil and subsea satellite Kipper for gas.

- in theory, both these options could be implemented simultaneously, although the equipment reuse potential may be somewhat less.
- in practice, however, sequential development is perhaps more suited to earliest development of the oil resource and development of gas as sales opportunities (under optimum development conditions) emerge 2005+.

Even considering the combined cost of a separate oil development employing an FPSO and a subsequent gas development by way of a subsea tie-back to Kipper, it is not considered likely that the life cycle cost of an integrated oil and gas processing facility would be more attractive. The principal reasons are:-

- all wells would still be subsea.
- there would most likely be a measure of subsea manifolding for the gas wells.
- similar costs for oil or gas export would apply.
- the cost differential again directionally reduces to the difference between placing the gas facilities offshore versus onshore in the case of comparing the subsea gas alternative, the former being significantly less expensive and driven also by the water depth (150m central to all fields).

In the context of a broader potential to jointly develop the resources of Kipper and Basker / Manta / Gummy, there is conceptually potential to locate an integrated well / process platform at Kipper with oil export to Tuna, and gas export via a smaller diameter compressed export pipeline to the shore. Despite this alternative being considered as a fully integrated case, the effective cost allocation to Basker / Manta / Gummy would directionally be at best similar but most likely greater than the combined costs of a leased FPSO (oil) / subsea tieback (gas) to Kipper options; hence there would at face value seem to be little benefit of an integrated production platform system for Vic/P19. It is also felt unlikely that for Kipper, there would be any substantial cost benefit. On this basis, it is suggested that this case not be further addressed at this point in time.

3.0 Selected Development Cases

On the basis of the alternative concept screening exercise, the following base case and sensitivity development concepts were selected for further definition and costing in regards to the assessment of the VIC/P19 resources:-

Base Cases, VIC/P19
- leased FPSO oil only development including gas injection (Basker / Manta).
- subsea satellite to Kipper gas only development (Manta / Gummy).
- leased FPSO oil development (Basker / Manta) followed by subsea gas development (Basker / Manta / Gummy) tied back to Kipper with maximum re-utilisation of oil wells and facilities.
    - note that for this case, the gas reinjected during the oil development is recovered through the tie back of the Basker injection well to the main Manta / Gummy gas gathering system.

Sensitivity Cases, VIC/P19
- project owned FPSO oil only development (Basker / Manta).
- subsea satellite to Tuna oil only development with associated gas sales and water injection (Basker / Manta).

In order to allow identification of the incremental value afforded through integration of VIC/P19 with VIC/RL2, standalone cases where also developed as per:-

Standalone Cases, VIC/P19
- subsea gas development of VIC/P19 with gas export via dedicated offshore pipeline, onshore gas plant and onshore pipeline (Manta / Gummy).

Standalone Cases, VIC/RL2
- leased FPSO development of VIC/RL2 (Kipper).
- subsea gas development of VIC/RL2 with gas export via dedicated offshore pipeline, onshore gas plant and onshore pipeline (Kipper).

All the above cases were assessed against the background of P50 reserves estimates and the "medium" (base) case gas marketing scenario, refer VIC/P19 evaluation Part 1, except for:-

Reserves
- P85 and P15 reserves levels assessed for:-
    - VIC/P19 leased FPSO oil only development (Basker / Manta)
    - " subsea satellite to Tuna " " "
    - VIC/P19 subsea satellite to Kipper gas only development (Manta / Gummy)
    - combined VIC/P19 & VIC/RL2 subsea gas development

Gas Market Scenarios
- "lo-low", "low" and "high" gas market scenarios for:-
    - subsea satellite to Kipper gas only development (Manta / Gummy)
    - combined VIC/P19 & VIC/RL2 subsea gas development

Table 3.1 Summary Case Matrix

	Vic/P19		Vic/P19		Vic/P19		Vic/P19	
Standalone	B/M oil only	1a, 1a(owned)	M/G gas only	1c	-	-	-	-
Integrated (tariffs)	B/M oil only	2i	M/G gas only	2e, 2e(i), 2e(ii), 2e(iii)	B/M/G gas only (after oil)	2f	B/M oil (standalone) + B/M/G gas	2g
	Kipper		**Kipper**					
Standalone	oil only	1b	gas only	1d, 1d(iii)				
Integrated (tariffs)	oil only	2b	gas only	2c, 2c(i), 2c(ii) (2c(iii))				
	Shared infrastructure (tariff)		**Shared infrastructure (no tariff)**					
Oil	FPSO at Basker	2a	-	-				
Gas								
- lo-low"	40PJ/yr	2d(i)	K/M/G gas only	3b(i)				
- "low" market	40PJ -> 60PJ/yr	2d(ii)	K/M/G gas only	3b(ii)				
- "base" market	60PJ/yr	2d	K/M/G gas only	3b				
- "high" market	60PJ -> 80PJ/yr	2d(iii)	K/M/G gas only	3b(iii)				

Table 3.2 Detailed Case Listing

Standalone developments

1a Basker / Manta oil only with gas injection (FPSO leased)
1a P85 Basker / Manta oil only with gas injection (FPSO leased) - P85 volumes
1a P15 Basker / Manta oil only with gas injection (FPSO leased) - P15 volumes
1a (owned) Basker / Manta oil only with gas injection (FPSO project owned)
1b Kipper oil only
1c (Basker) / Manta / Gummy gas only - "medium" (base case) gas market scenario
1d Kipper gas only - "medium" (base case) gas market scenario

Satellite developments (third party tariffing)

2a Basker / Manta / Kipper common oil production and export system
2b Kipper oil only tie-back (to Basker / Manta oil development - under this scenario, Kipper gas development would be delayed)
2c & 2c(iii) Kipper gas only - "medium" (base case) & "high" gas market scenario (precedes Gummy/Manta gas development)
2c(i) & 2c(ii) Kipper gas only - "lo-low" & "low" gas market scenario (precedes Gummy/Manta gas development)
2d Kipper / (Basker) / Manta / Gummy common gas export / processing system (Kipper manifold to Longford) - "medium" (base case) gas market scenario
2d P85 Kipper / (Basker) / Manta / Gummy common gas export/process system (Kipper to Longford) - "medium" (base case) gas market scenario - P85 volumes
2d P15 Kipper / (Basker) / Manta / Gummy common gas export/process system (Kipper to Longford) - "medium" (base case) gas market scenario - P15 volumes
2d(i) As per 2d but with "lo-low" gas market scenario
2d(ii) As per 2d but with "low" gas market scenario
2d(iii) As per 2d but with "high" gas market scenario
2e Manta / Gummy gas only tie-back (to Kipper gas only development) - "medium" (base case) gas market scenario
2e P85 Manta / Gummy gas only tie-back (to Kipper gas only development) - "medium" (base case) gas market scenario - P85 volumes
2e P15 Manta / Gummy gas only tie-back (to Kipper gas only development) - "medium" (base case) gas market scenario - P15 volumes
2e(i) As per 2e but with "lo-low" gas market scenario
2e(ii) As per 2e but with "low" gas market scenario
2e(iii) As per 2e but with "high" gas market scenario
2f Basker / Manta / Gummy gas only tie-back but after Basker/Manta oil development - "medium" (base case) gas market scenario
2g Basker / Manta oil development followed by Basker / Manta / Gummy gas only tie-back - "medium" (base case) gas market scenario
2h Basker / Manta oil development with Kipper tariffed (under this scenario, Kipper gas development would be delayed) - *case not evaluated*
2i Basker / Manta oil only with water injection (Tuna satellite)
2i P85 Basker / Manta oil only with water injection (Tuna satellite) - P15 volumes
2i P15 Basker / Manta oil only with water injection (Tuna satellite) - P85 volumes

Integrated developments (full co-operative zero tariffing)

3a Basker / Manta / Kipper oil devt integrated with Basker / Manta / Gummy / Kipper gas - "medium" (base case) gas market scenario - *case not evaluated*
3b Kipper + Manta/Gummy gas only - "medium" (base case) gas market scenario
3b(i) Kipper + Manta/Gummy gas only - "lo-low" gas market scenario
3b(ii) Kipper + Manta/Gummy gas only - "low" gas market scenario
3b(iii) Kipper + Manta/Gummy gas only - "high" gas market scenario

Notes:-

1 Alternate gas market scenarios defined as "low/low", "low", and "high" where case references are suffixed as (i), (ii) and (iii) respectively
2 Unless indicated otherwise, all cases based on P50 volumetrics; case reference suffixes "P85" & "P15" refer to cases based on P85 & P15 volumetrics

4.0 Appraisal and Development Costs

The basis for developing costs estimates has been drawn largely from data provided in relation to the various Retention Lease Applications submitted for both VIC/P19 and VIC/RL2. These data have been considered and adapted as required in order to provide the basis for addressing the full range of alternate development scenarios addressed in this study.

Where relevant data was not available from the above referenced material, RISC has employed its own databases and associated cost engineering models in conjunction with any similarly relevant information available from Shell.

All costs, with the exception of those explicitly discussed below, are considered to represent "P50" (or 50/50) values and by definition include a measure of contingency. These costs should generally be considered to be of a "screening" type confidence level. However, because some components of the cost estimates are drawn from public domain reported project costs or study work which has accessed relevant historical and local Bass Strait / Australian experience, the accuracy level is considered to be better than the traditional ~ +/-40% applied screening level costs. This applies to cost estimates relating to, for example, pipelines, onshore plants, and subsea gas systems (ref. the recent East Spar gas project). Recognising also that the "P85" or "P15" outcomes for all components of a development are highly unlikely to occur at the same time, it is suggested that the costs developed for this study could be considered to have a "P85"/"P15" accuracy range of the order of -20% to +30%, *for the scopes defined for each case presented.*

The exceptions to the above relate to drilling costs and leased / low cost FPSOs, where a "best practice / bullish view" has been adopted.

In the case of drilling, the estimates presented for appraisal and development drilling are designed to reflect the dramatic cost reductions which have been and continue to be achieved in the industry. These reductions stem from a combination of improvements in design efficiency, operational efficiency and technology leading to reductions in drilling times, material and consumables costs. Recent examples of significant drilling cost reductions in Australia are exemplified by BHPP's recent reductions in Timor Sea drilling times by up ~ 40%, and Woodside's exploration and development drilling operations on the North West Shelf. The estimates are also predicated on the basis that there will be a softening in the rig market by mid 1999 as compared to late 1997 / early 1998 rig rates, and a continued softening through to the year 2000+ when development drilling could conceptually commence for VIC/P19 oil or gas development. Consequently, whilst the costs presented for drilling are considered to be credible performance targets, the accuracy range could be considered to be more in the range -10% to +50%.

In the case of oil development scenarios based on the use of an FPSO, the approach to defining costs has been driven by the expectation that unless "industry minimum" costs can be achieved, then development would not be economic. By definition, therefore, the costs presented for the FPSO units, either leased or project owned, are not "P50" (or 50/50) estimates ; rather they reflect perhaps a "P30" outcome. The costs have been predicated on the basis that right vessel with existing suitable mooring, production and safety systems becomes available at the right time. These conditions must of course be coupled with such a vessel becoming available at the right price, and therefore necessarily suggests that this points to an "old vessel" with perhaps limited remaining serviceable life. A recent example of such a vessel would perhaps be the sale of the Skua Venture which conceptually would have been suitable with limited modification and upgrade for application on VIC/P19. This vessel is now being leased back to the Elang-Kakatua JV, and is understood to be a possible candidate for later deployment on the Buffalo field.

Beyond the important assumptions upon which this case is predicated, it has been assumed such a vessel would not be available with gas injection compression and hence additional costs have been added accordingly. For the lease scenario, a base day rate for the FPSO/mooring system of A$125,000/day has been assumed along with a A$10million mobilisation/installation charge. For a project owned FPSO scenario, the same background capital costs for the leased case were used but with the addition of 10% project management costs to cover a potential contractor's costs.

In summary, capital costs under the base gas market scenario and subsea developments for standalone development of Manta/Gummy and Kipper each with dedicated offshore export and onshore processing / export amount to A$576million and A$514million respectively including appraisal, or a total of A$1090million. On an integrated basis where export and processing infrastructure is shared in some way, the total capital costs for development of both assets is estimated to be A$799million of which A$285million relates to Manta/Gummy (tied back to Kipper), A$139million is required for Kipper (excluding export etc.), and A$375million relates to the export / processing system from Kipper to Longford. The capital saving across the two assets through integration is therefore of the order of A$300million.

Tables 4.1 - 4.2 and Figure 4.1 indicate the allocation of costs across the major project cost categories for the key Manta/Gummy and Kipper scenarios. Figure 4.2 indicates the relative total standalone capital costs and the saving potential through integration.

Table 4.1 Standalone Development Cost Summaries

Standalone Manta/Gummy development
Dedicated offshore and onshore export system

	40PJ/yr ACQ (155TJ/d MDQ)
Appraisal drilling	39
Development drilling	92
Subsea systems and control (ex NCC buoy)	116
Offshore pipeline	97
Onshore plant	136
Compression	30
Onshore pipeline	61
Other	5
Total	576

Standalone Kipper development
Dedicated offshore and onshore export system

	60PJ/yr ACQ (230TJ/d MDQ)
Appraisal drilling	0
Development drilling	60
Subsea systems and control (ex onshore)	76
Offshore pipeline	84
Onshore plant	177
Compression	46
Onshore pipeline	66
Other	5
Total	514

Table 4.2 Integrated Scenario Development Cost Summaries (offshore excluding common export / processing system)

Integrated Manta/Gummy only development
Utilises shared offshore and onshore export system

	40PJ/yr ACQ (155TJ/d MDQ) "lo-low market scenario"	40PJ/yr ->60PJ/yr ACQ (230TJ/d MDQ) "low market scenario"	60PJ/yr ACQ (230TJ/d MDQ) "medium market scenario"	60PJ/yr ->80PJ/yr ACQ (310TJ/d MDQ) "high market scenario"
Appraisal drilling	39	39	39	39
Development drilling	92	92	92	92
Subsea systems and control (NCC buoy)	116	116	116	116
Offshore pipeline	34	34	36	34
Other	2	2	2	2
Total	283	283	285	283

Integrated Kipper only development
Utilises shared offshore and onshore export system

	40PJ/yr ACQ (155TJ/d MDQ) "lo-low market scenario"	40PJ/yr ->60PJ/yr ACQ (230TJ/d MDQ) "low market scenario"	60PJ/yr ACQ (230TJ/d MDQ) "medium market scenario"	60PJ/yr ->80PJ/yr ACQ (310TJ/d MDQ) "high market scenario"
Appraisal drilling	0	0	0	0
Development drilling	45	45	60	60
Subsea systems and control (ex onshore)	61	61	77	77
Offshore pipeline	0	0	0	0
Other	2	2	2	2
Total	108	108	139	139

complete by end 2002 with PSA occurring in early 2003; this is considered to be a more than adequate time frame.

Under the scenario where an integrated development with Kipper is contemplated, then in order for common export / processing systems to be adequately defined and commercial arrangements put in place, an earlier completion of Manta / Gummy appraisal would be required prior to the Kipper development PSA assumed to be early 2000. For this to be achieved, at least one appraisal well would need to be drilled early - mid 1999 irrespective of the timing of a later Manta / Gummy development.

For oil development, an aggressive schedule is envisaged which requires an appraisal well to be drilled in Basker in early 1999 in order to achieve completion of project definition and PSA by January 2000. This then allows a period of 12 months for the procurement and installation of equipment and contracting of a leased FPSO. Certain items, including for example flexible flowlines and subsea xmas trees will be critical path perhaps requiring order placement prior to PSA. The highest schedule risk associated with this scenario is of course the securing of a suitable FPSO. Since the economics of any development employing an FPSO will almost certainly rely on securing a vessel at a low day rate, this development within the above timeframe may well not be achievable simply because a suitable vessel is not available on the market.

Appendix B includes phased activity, production and cost sheets for each case developed. Key activities are shown along with definition of drilling activities, namely appraisal well(s), appraisal well conversion(s) (denoted "c"), development sidetrack(s) (denoted "st'), and horizontal and injection wells (denoted "h" and "inj" respectively).

Appendix A

Case Definition and Cost Summaries

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Shell Development Australia
Basker Manta Evaluation
Case Definitions and Costs

Case definition		
Case reference	1a	1a P85
Gas sales, PJ	0.0	0.0
Oil/condensate reserves, mmb	17.9	11.9
Scheme	B/M oil - gas inj	B/M oil - gas inj - P85
Integration	Standalone leased FPSO	Standalone leased FPSO
Products / peak avg. sales rates	40 mmscf/d gas inj 9.0MMstb/yr	40 mmscf/d gas inj 9.0MMstb/yr
Parameters		
System		
Exploration well TVD, m	-	-
Appraisal well TVD, m	3200	3200
No. appraisal wells	1	1
No. appraisal campaigns	1	1
Development well TVD, m	3200 / 2850	3200 / 2850
No. development wells	4	4
No. appraisal well conversions, dev well s/ts or recomps	2	2
New production/injection wells	3	3
No. wells at central site	3	3
No. predrilled wells (incl. conversions)	4	4
No. satellite well sites	1	1
Avg. wells/satellite site	1	1
No. devt drilling campaigns (incl. predrilling)	2	2
Raw gas production capacity, mmscf/d	40	40
Avg. raw gas production rate, mmscf/d	-	-
Avg. maximum sales gas rate, TJ/d	0	0
Peak oil/cond rate, mbd	25	25
Field life, years	4years - 5mbd	3years - 5mbd
Critical oil/gas host/onshore plant arrival pressure, psi	400	400
Offshore pipeline to onshore plant distance, km	0	0
Offshore pipeline nominal size, inches	-	-
Onshore pipeline export distance, km	0	0
Onshore pipeline nominal size, inches	-	-
Compression required, year of production	-	-

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Shell Development Australia

Basker Manta Evaluation

Case Definitions and Costs

Case definition		
Case reference	1a	1a P85
Gas sales, PJ	0.0	0.0
Oil/condensate reserves, mmb	17.9	11.9
Scheme	B/M oil - gas inj	B/M oil - gas inj - P85
Integration	Standalone leased FPSO	Standalone leased FPSO
Products / peak avg. sales rates	40 mmscf/d gas inj	40 mmscf/d gas inj
	9.0MMstb/yr	9.0MMstb/yr
Capital costs, A$mm (1.1.98) - most likely	91.7	
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	13.7	13.7
Appraisal well conversion(s)	10.5	10.5
Development / commercial planning	1.0	1.0
Predrilled development wells	43.7	43.7
Post start-up development wells	8.6	8.6
Subsea manifold cluster(s)	0.0	0.0
Subsea cluster flowline set(s)	0.0	0.0
Subsea satellite pipeline set(s)	24.5	24.5
Field control / host facility costs (tie-ins / facilities)	2.3	2.3
FPSO mobilisation / supply	10.0	10.0
Main export pipeline/control umbilical	0.0	0.0
Project management	1.5	1.5
Total offshore	*116*	*116*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	***116***	***116***
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.8	1.8
Offshore facilities	0.5	0.5
Leased / project owned FPSO	45.6	45.6
Technical support/offshore logistics base/insurance	2.3	2.3
Total offshore	*50.1*	*50.1*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***50.1***	***50.1***
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	12.0	12.0
Offshore facilities	0.7	0.7
Sale value at abandonment	0.0	0.0
Total offshore	*12.7*	*12.7*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***12.7***	***12.7***

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Basker Manta Evaluation
Case Definitions and Costs

Case definition			
	Case reference	1a P15	1a(owned)
	Gas sales, PJ	0.0	0.0
	Oil/condensate reserves, mmb	26.0	20.4
	Scheme	B/M oil - gas inj - P15	B/M oil - gas inj
	Integration	Standalone leased FPSO	Standalone project owned FPSO
	Products / peak avg. sales rates	40 mmscf/d gas inj	40 mmscf/d gas inj
		9.0MMstb/yr	9.0MMstb/yr
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	3200	3200
	No. appraisal wells	1	1
	No. appraisal campaigns	1	1
	Development well TVD, m	3200 / 2850	3200 / 2850
	No. development wells	4	4
	No. appraisal well conversions, dev well s/ts or recomps	3	2
	New production/injection wells	3	3
	No. wells at central site	3	3
	No. predrilled wells (incl. conversions)	4	4
	No. satellite well sites	1	1
	Avg. wells/satellite site	1	1
	No. devt drilling campaigns (incl. predrilling)	2	2
	Raw gas production capacity, mmscf/d	40	40
	Avg. raw gas production rate, mmscf/d	-	-
	Avg. maximum sales gas rate, TJ/d	0	0
	Peak oil/cond rate, mbd	25	25
	Field life, years	6years -> 5mbd	4years -> 5mbd
	Critical oil/gas host/onshore plant arrival pressure, psi	400	400
	Offshore pipeline to onshore plant distance, km	0	0
	Offshore pipeline nominal size, inches	-	-
	Onshore pipeline export distance, km	0	0
	Onshore pipeline nominal size, inches	-	-
	Compression required, year of production	-	-

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Shell Development Australia
Basker Manta Evaluation
Case Definitions and Costs

	1a P15	1a(owned)
Case definition		
Case reference	1a P15	1a(owned)
Gas sales, PJ	0.0	0.0
Oil/condensate reserves, mmb	26.0	20.4
Scheme	B/M oil - gas inj - P15	B/M oil - gas inj
Integration	Standalone leased FPSO	Standalone project owned FPSO
Products / peak avg. sales rates	40 mmscf/d gas inj 9.0MMstb/yr	40 mmscf/d gas inj 9.0MMstb/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	13.7	13.7
Appraisal well conversion(s)	10.5	10.5
Development / commercial planning	1.0	1.0
Predrilled development wells	43.7	43.7
Post start-up development wells	16.5	8.6
Subsea manifold cluster(s)	0.0	0.0
Subsea cluster flowline set(s)	0.0	0.0
Subsea satellite pipeline set(s)	24.5	24.5
Field control / host facility costs (tie-ins / facilities)	2.3	2.3
FPSO mobilisation / supply	10.0	92.3
Main export pipeline/control umbilical	0.0	0.0
Project management	1.5	9.7
Total offshore	*124*	*207*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	*124*	*207*
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.8	1.8
Offshore facilities	0.5	0.5
Leased / project owned FPSO	45.6	14.7
Technical support/offshore logistics base/insurance	2.3	3.0
Total offshore	*50.2*	*19.9*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*50.2*	*19.9*
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	12.0	12.0
Offshore facilities	0.7	4.8
Sale value at abandonment	0.0	25.0
Total offshore	*12.7*	*-8.2*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*12.7*	*-8.2*

101.2

78

128.8

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Case Definitions and Costs

Case definition			
	Case reference	1b	1c
	Gas sales, PJ	-	430.0
	Oil/condensate reserves, mmb	5.1	18
	Scheme	K oil - gas inj	M/G gas only
	Integration	Standalone leased FPSO	Standalone off/onshore
	Products / peak avg. sales rates	2.8MMstb/yr	40 PJ/yr(155TJ/d MDQ)
		-	1.8 MMstb/yr
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	0	3300 / 3500
	No. appraisal wells	0	3
	No. appraisal campaigns	0	2
	Development well TVD, m	2300	3300 / 3500
	No. development wells	6	5
	No. appraisal well conversions, dev well s/ts or recomps	0	2
	New production/injection wells	6	3
	No. wells at central site	0	5
	No. predrilled wells (incl. conversions)	6	3
	No. satellite well sites	6	0
	Avg. wells/satellite site	1	0
	No. devt drilling campaigns (incl. predrilling)	1	3
	Raw gas production capacity, mmscf/d	16	158
	Avg. raw gas production rate, mmscf/d	-	112
	Avg. maximum sales gas rate, TJ/d	0	109
	Peak oil/cond rate, mbd	8	7
	Field life, years	2 years > 5mbd	20
	Critical oil/gas host/onshore plant arrival pressure, psi	150	800 at 3:1 comp
	Offshore pipeline to onshore plant distance, km	0	70
	Offshore pipeline nominal size, inches	0	20
	Onshore pipeline export distance, km	0	150
	Onshore pipeline nominal size, inches	-	14
	Compression required, year of production	-	1 & 4

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Case Definitions and Costs

Case definition		
Case reference	1b	1c
Gas sales, PJ	-	430.0
Oil/condensate reserves, mmb	5.1	18
Scheme	K oil - gas inj	M/G gas only
Integration	Standalone leased FPSO	Standalone off/onshore
Products / peak avg. sales rates	2.8MMstb/yr	40 PJ/yr(155TJ/d MDQ)
	-	1.8 MMstb/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.0	1.0
Appraisal wells	0.0	39.3
Appraisal well conversion(s)	0.0	27.7
Development / commercial planning	1.0	2.0
Predrilled development wells	81.5	17.3
Post start-up development wells	0.0	47.1
Subsea manifold cluster(s)	0.0	60.0
Subsea cluster flowline set(s)	0.0	15.0
Subsea satellite pipeline set(s)	23.8	0.0
Field control / host facility costs (tie-ins / facilities)	2.3	30.0
FPSO mobilisation / supply	9.1	0.0
Main export pipeline/control umbilical	0.0	96.0
Project management	1.4	10.1
Total offshore	*119*	*346*
Onshore		
Development / commercial planning	0.0	3.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	124.0
Compression	0.0	27.0
Export pipeline	0.0	59.5
Project management	0.0	16.6
Total onshore	*0*	*230*
Grand total	***119***	***576***
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	0.0	1.8
Offshore facilities	0.5	7.9
Leased / project owned FPSO	45.6	0.0
Technical support/offshore logistics base/insurance	2.3	4.0
Total offshore	*48.4*	*13.6*
Onshore		
Onshore plant	0.0	5.6
Incremental compression	0.0	2.0
Technical support	0.0	1.7
Total onshore	*0.0*	*9.2*
Grand total	***48.4***	***22.9***
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	18.0	15.0
Offshore facilities	0.6	4.8
Sale value at abandonment	0.0	0.0
Total offshore	*18.6*	*19.8*
Onshore		
Onshore plant	0.0	9.0
Environmental rehabilitation	0.0	1.0
Total onshore	*0.0*	*10.0*
Grand total	***18.6***	***29.8***

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Case Definitions and Costs

Case definition			
	Case reference	1d	2a
	Gas sales, PJ	561.0	-
	Oil/condensate reserves, mmb	11	31
	Scheme	Kipper gas only	K/B/M oil only
	Integration	Standalone off/onshore	Shared leased FPSO
	Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)	-
		1.2 MMstb/yr	-
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	0	0
	No. appraisal wells	0	0
	No. appraisal campaigns	0	0
	Development well TVD, m	2300	0
	No. development wells	4	0
	No. appraisal well conversions. dev well s/ts or recomps	0	0
	New production/injection wells	4	0
	No. wells at central site	4	0
	No. predrilled wells (incl. conversions)	3	0
	No. satellite well sites	0	0
	Avg. wells/satellite site	0	0
	No. devt drilling campaigns (incl. predrilling)	2	0
	Raw gas production capacity, mmscf/d	260	0
	Avg. raw gas production rate, mmscf/d	185	0
	Avg. maximum sales gas rate, TJ/d	164	0
	Peak oil/cond rate, mbd	5	25
	Field life, years	12	~ 6 years economic
	Critical oil/gas host/onshore plant arrival pressure, psi	800 at 3:1 comp	-
	Offshore pipeline to onshore plant distance, km	55	0
	Offshore pipeline nominal size, inches	24	0
	Onshore pipeline export distance, km	150	0
	Onshore pipeline nominal size, inches	16	-
	Compression required, year of production	1 & 7	-

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Case Definitions and Costs

Case definition

	1d	2a
Case reference	1d	2a
Gas sales, PJ	561.0	-
Oil/condensate reserves, mmb	11	31
Scheme	Kipper gas only	K/B/M oil only
Integration	Standalone off/onshore	Shared leased FPSO
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)	-
	1.2 MMstb/yr	-

Capital costs, A$mm (1.1.98) - most likely

	1d	2a
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.0	0.0
Appraisal wells	0.0	0.0
Appraisal well conversion(s)	0.0	0.0
Development / commercial planning	2.0	0.5
Predrilled development wells	45.0	0.0
Post start-up development wells	15.0	0.0
Subsea manifold cluster(s)	48.0	0.0
Subsea cluster flowline set(s)	12.0	0.0
Subsea satellite pipeline set(s)	0.0	0.0
Field control / host facility costs (tie-ins / facilities)	2.3	0.0
FPSO mobilisation / supply	0.0	10.0
Main export pipeline/control umbilical	91.6	0.0
Project management	6.1	1.0
Total offshore	*222*	*12*
Onshore		
Development / commercial planning	3.0	0.0
Gas plant (incl. CO_2 removal, LPG extraction)	160.0	0.0
Compression	42.0	0.0
Export pipeline	64.0	0.0
Project management	21.8	0.0
Total onshore	*291*	*0*
Grand total	*513*	*12*

Peak operating costs, A$mm/yr (1.1.98) - most likely

	1d	2a
Offshore		
Wells (annual average)	1.4	0.0
Offshore facilities	4.2	0.0
Leased / project owned FPSO	0.0	45.6
Technical support/offshore logistics base/insurance	3.1	1.5
Total offshore	*8.6*	*47.1*
Onshore		
Onshore plant	7.0	0.0
Incremental compression	3.2	0.0
Technical support	2.0	0.0
Total onshore	*12.1*	*0.0*
Grand total	*20.8*	*47.1*

Tariff charges

	1d	2a
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00

Abandonment costs, A$mm (1.1.98)

	1d	2a
Offshore		
Wells	12.0	0.0
Offshore facilities	2.8	0.5
Sale value at abandonment	0.0	0.0
Total offshore	*14.8*	*0.5*
Onshore		
Onshore plant	11.7	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*11.7*	*0.0*
Grand total	*26.5*	*0.5*

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Case Definitions and Costs

Case definition			
	Case reference	2b	2c, 2c(iii)
	Gas sales, PJ	-	561.0
	Oil/condensate reserves, mmb	11.5	11
	Scheme	K oil - gas inj at B/M	Kipper gas only
	Integration	S'sea satellite - tariff thro' B/M	Tariff thro' shared export system - "base/high" market
	Products / peak avg. sales rates	2.8MMstb/yr	60 PJ/yr(230TJ/d MDQ)
		-	1.2 MMstb/yr
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	0	0
	No. appraisal wells	0	0
	No. appraisal campaigns	0	0
	Development well TVD, m	2300	2300
	No. development wells	5	4
	No. appraisal well conversions, dev well s/ts or recomps	2	0
	New production/injection wells	5	4
	No. wells at central site	5	4
	No. predrilled wells (incl. conversions)	5	3
	No. satellite well sites	0	0
	Avg. wells/satellite site	0	0
	No. devt drilling campaigns (incl. predrilling)	2	2
	Raw gas production capacity, mmscf/d	16	260
	Avg. raw gas production rate, mmscf/d	-	185
	Avg. maximum sales gas rate, TJ/d	0	164
	Peak oil/cond rate, mbd	8	5
	Field life, years	~ 6 years economic	12
	Critical oil/gas host/onshore plant arrival pressure, psi	400	800 at 3:1 comp
	Offshore pipeline to onshore plant distance, km	15	0
	Offshore pipeline nominal size, inches	8	0
	Onshore pipeline export distance, km	0	0
	Onshore pipeline nominal size, inches	-	0
	Compression required, year of production	-	0

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Case Definitions and Costs

Case definition

Case reference	2b	2c, 2c(iii)
Gas sales, PJ	-	561.0
Oil/condensate reserves, mmb	11.5	11
Scheme	K oil - gas inj at B/M	Kipper gas only
Integration	S'sea satellite - tariff thro' B/M	Tariff thro' shared export system - "base/high" market
Products / peak avg. sales rates	2.8MMstb/yr	60 PJ/yr(230TJ/d MDQ)
	-	1.2 MMstb/yr

Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.0	0.0
Appraisal wells	0.0	0.0
Appraisal well conversion(s)	0.0	0.0
Development / commercial planning	1.0	2.0
Predrilled development wells	75.5	45.0
Post start-up development wells	6.5	15.0
Subsea manifold cluster(s)	21.1	48.0
Subsea cluster flowline set(s)	2.5	12.0
Subsea satellite pipeline set(s)	0.0	0.0
Field control / host facility costs (tie-ins / facilities)	3.0	2.3
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	12.7	8.6
Project management	2.6	5.2
Total offshore	*125*	*138*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	*125*	*138*

Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.0	1.4
Offshore facilities	1.9	4.0
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	2.3	2.4
Total offshore	*5.3*	*7.8*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*5.3*	*7.8*

Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00

Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	15.0	12.0
Offshore facilities	1.2	2.6
Sale value at abandonment	0.0	0.0
Total offshore	*16.2*	*14.6*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*16.2*	*14.6*

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Case Definitions and Costs

Case definition		
Case reference	2c(i), 2c(ii)	2d
Gas sales, PJ	561.0	991.0
Oil/condensate reserves, mmb	11	-
Scheme	Kipper gas only	M/G/K gas
Integration	Tariff thro' shared export system - "low/lo-low" market	Shared systems - "base" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 0.8 MMstb/yr	60 PJ/yr(230TJ/d MDQ)
Parameters		
System		
Exploration well TVD, m	-	-
Appraisal well TVD, m	0	-
No. appraisal wells	0	0
No. appraisal campaigns	0	0
Development well TVD, m	2300	-
No. development wells	3	0
No. appraisal well conversions, dev well s/ts or recomps	0	0
New production/injection wells	3	0
No. wells at central site	3	0
No. predrilled wells (incl. conversions)	3	0
No. satellite well sites	0	0
Avg. wells/satellite site	0	0
No. devt drilling campaigns (incl. predrilling)	1	0
Raw gas production capacity, mmscf/d	174	260
Avg. raw gas production rate, mmscf/d	124	185
Avg. maximum sales gas rate, TJ/d	109	164
Peak oil/cond rate, mbd	3	-
Field life, years	17	25
Critical oil/gas host/onshore plant arrival pressure, psi	800 at 3:1 comp	800 at 3:1 comp
Offshore pipeline to onshore plant distance, km	0	55
Offshore pipeline nominal size, inches	0	24
Onshore pipeline export distance, km	0	150
Onshore pipeline nominal size, inches	0	16
Compression required, year of production	0	1 & 7

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Case definition		
Case reference	2c(i), 2c(ii)	2d
Gas sales, PJ	561.0	991.0
Oil/condensate reserves, mmb	11	-
Scheme	Kipper gas only	M/G/K gas
Integration	Tariff thro' shared export system - "low/lo-low" market	Shared systems - "base" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 0.8 MMstb/yr	60 PJ/yr(230TJ/d MDQ)

Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.0	0.0
Appraisal wells	0.0	0.0
Appraisal well conversion(s)	0.0	0.0
Development / commercial planning	2.0	1.0
Predrilled development wells	45.0	0.0
Post start-up development wells	0.0	0.0
Subsea manifold cluster(s)	36.0	0.0
Subsea cluster flowline set(s)	9.0	0.0
Subsea satellite pipeline set(s)	0.0	0.0
Field control / host facility costs (tie-ins / facilities)	2.3	0.0
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	8.6	83.0
Project management	4.0	0.8
Total offshore	*107*	*85*
Onshore		
Development / commercial planning	0.0	3.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	160.0
Compression	0.0	42.0
Export pipeline	0.0	64.4
Project management	0.0	21.8
Total onshore	*0*	*291*
Grand total	*107*	*376*

Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.1	0.0
Offshore facilities	3.0	0.2
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	2.2	0.6
Total offshore	*6.3*	*0.8*
Onshore		
Onshore plant	0.0	7.0
Incremental compression	0.0	3.2
Technical support	0.0	2.0
Total onshore	*0.0*	*12.1*
Grand total	*6.3*	*13.0*

Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00

Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	9.0	0.0
Offshore facilities	2.0	0.2
Sale value at abandonment	0.0	0.0
Total offshore	*11.0*	*0.2*
Onshore		
Onshore plant	0.0	11.7
Environmental rehabilitation	0.0	1.0
Total onshore	*0.0*	*12.7*
Grand total	*11.0*	*12.9*

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Case Definitions and Costs

Case definition

	2d P85	2d P15
Case reference	2d P85	2d P15
Gas sales, PJ	720.0	1443.0
Oil/condensate reserves, mmb	-	-
Scheme	M/G/K gas - P85	M/G/K gas - P15
Integration	Shared systems - "base" market	Shared systems - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)	60 PJ/yr(230TJ/d MDQ)

Parameters

System		
Exploration well TVD, m	-	-
Appraisal well TVD, m	-	-
No. appraisal wells	0	0
No. appraisal campaigns	0	0
Development well TVD, m	-	-
No. development wells	0	0
No. appraisal well conversions, dev well s/ts or recomps	0	0
New production/injection wells	0	0
No. wells at central site	0	0
No. predrilled wells (incl. conversions)	0	0
No. satellite well sites	0	0
Avg. wells/satellite site	0	0
No. devt drilling campaigns (incl. predrilling)	0	0
Raw gas production capacity, mmscf/d	260	260
Avg. raw gas production rate, mmscf/d	185	185
Avg. maximum sales gas rate, TJ/d	164	164
Peak oil/cond rate, mbd	-	-
Field life, years	20	33
Critical oil/gas host/onshore plant arrival pressure, psi	800 at 3:1 comp	800 at 3:1 comp
Offshore pipeline to onshore plant distance, km	55	55
Offshore pipeline nominal size, inches	24	24
Onshore pipeline export distance, km	150	150
Onshore pipeline nominal size, inches	16	16
Compression required, year of production	1 & 5	1 & 9

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Case definition		
Case reference	2d P85	2d P15
Gas sales, PJ	720.0	1443.0
Oil/condensate reserves, mmb	-	-
Scheme	M/G/K gas - P85	M/G/K gas - P15
Integration	Shared systems - "base" market	Shared systems - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)	60 PJ/yr(230TJ/d MDQ)
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.0	0.0
Appraisal wells	0.0	0.0
Appraisal well conversion(s)	0.0	0.0
Development / commercial planning	1.0	1.0
Predrilled development wells	0.0	0.0
Post start-up development wells	0.0	0.0
Subsea manifold cluster(s)	0.0	0.0
Subsea cluster flowline set(s)	0.0	0.0
Subsea satellite pipeline set(s)	0.0	0.0
Field control / host facility costs (tie-ins / facilities)	0.0	0.0
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	83.0	83.0
Project management	0.8	0.8
Total offshore	*85*	*85*
Onshore		
Development / commercial planning	3.0	3.0
Gas plant (incl. CO_2 removal, LPG extraction)	160.0	160.0
Compression	42.0	42.0
Export pipeline	64.4	64.4
Project management	21.8	21.8
Total onshore	*291*	*291*
Grand total	*376*	*376*
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	0.0	0.0
Offshore facilities	0.2	0.2
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	0.6	0.6
Total offshore	*0.8*	*0.8*
Onshore		
Onshore plant	7.0	7.0
Incremental compression	3.2	3.2
Technical support	2.0	2.0
Total onshore	*12.1*	*12.1*
Grand total	*13.0*	*13.0*
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	0.0	0.0
Offshore facilities	0.2	0.2
Sale value at abandonment	0.0	0.0
Total offshore	*0.2*	*0.2*
Onshore		
Onshore plant	11.7	11.7
Environmental rehabilitation	1.0	1.0
Total onshore	*12.7*	*12.7*
Grand total	*12.9*	*12.9*

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Case Definitions and Costs

Case definition

Case reference	2d(i)	2d(ii)
Gas sales, PJ	991.0	991.0
Oil/condensate reserves, mmb	-	-
Scheme	M/G/K gas	M/G/K gas
Integration	Shared systems - "lo-low" market	Shared systems - "low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ)	60 PJ/yr(230TJ/d MDQ)

Parameters

System		
Exploration well TVD, m	-	-
Appraisal well TVD, m	0	-
No. appraisal wells	0	0
No. appraisal campaigns	0	0
Development well TVD, m	0	-
No. development wells	0	0
No. appraisal well conversions, dev well s/ts or recomps	0	0
New production/injection wells	0	0
No. wells at central site	0	0
No. predrilled wells (incl. conversions)	0	0
No. satellite well sites	0	0
Avg. wells/satellite site	0	0
No. devt drilling campaigns (incl. predrilling)	0	0
Raw gas production capacity, mmscf/d	174	260
Avg. raw gas production rate, mmscf/d	124	185
Avg. maximum sales gas rate, TJ/d	109	164
Peak oil/cond rate, mbd	-	-
Field life, years	30	26
Critical oil/gas host/onshore plant arrival pressure, psi	-	800 at 3:1 comp
Offshore pipeline to onshore plant distance, km	55	55
Offshore pipeline nominal size, inches	20	24
Onshore pipeline export distance, km	150	150
Onshore pipeline nominal size, inches	14	14
Compression required, year of production	1 & 11	1 & 9

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Case Definitions and Costs

Case definition	2d(i)	2d(ii)
Case reference	2d(i)	2d(ii)
Gas sales, PJ	991.0	991.0
Oil/condensate reserves, mmb	-	-
Scheme	M/G/K gas	M/G/K gas
Integration	Shared systems - "lo-low" market	Shared systems - "low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ)	60 PJ/yr(230TJ/d MDQ)

Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.0	0.0
Appraisal wells	0.0	0.0
Appraisal well conversion(s)	0.0	0.0
Development / commercial planning	1.0	1.0
Predrilled development wells	0.0	0.0
Post start-up development wells	0.0	0.0
Subsea manifold cluster(s)	0.0	0.0
Subsea cluster flowline set(s)	0.0	0.0
Subsea satellite pipeline set(s)	0.0	0.0
Field control / host facility costs (tie-ins / facilities)	0.0	0.0
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	74.3	83.0
Project management	0.7	0.8
Total offshore	*76*	*85*
Onshore		
Development / commercial planning	3.0	3.0
Gas plant (incl. CO2 removal, LPG extraction)	123.6	162.7
Compression	27.3	43.6
Export pipeline	59.5	64.4
Project management	16.6	22.2
Total onshore	*230*	*296*
Grand total	*306*	*381*

Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	0.0	0.0
Offshore facilities	0.2	0.2
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	0.6	0.6
Total offshore	*0.8*	*0.8*
Onshore		
Onshore plant	5.4	7.0
Incremental compression	2.0	3.2
Technical support	1.7	2.0
Total onshore	*9.0*	*12.1*
Grand total	*9.8*	*13.0*

Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00

Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	0.0	0.0
Offshore facilities	0.2	0.2
Sale value at abandonment	0.0	0.0
Total offshore	*0.2*	*0.2*
Onshore		
Onshore plant	8.8	11.6
Environmental rehabilitation	1.0	1.0
Total onshore	*9.8*	*12.6*
Grand total	*10.0*	*12.8*

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Case definition			
	Case reference	2d(iii)	2e
	Gas sales, PJ	991.0	430.0
	Oil/condensate reserves, mmb	-	18.1
	Scheme	M/G/K gas	M/G gas only
	Integration	Shared systems - "high" market	Tariff thro' Kipper - "base" market
	Products / peak avg. sales rates	80 PJ/yr(310TJ/d MDQ)	60 PJ/yr(230TJ/d MDQ)
			2.4 MMstb/yr
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	0	3300 / 3500
	No. appraisal wells	0	3
	No. appraisal campaigns	0	2
	Development well TVD, m	0	3300 / 3500
	No. development wells	0	5
	No. appraisal well conversions, dev well s/ts or recomps	0	2
	New production/injection wells	0	3
	No. wells at central site	0	5
	No. predrilled wells (incl. conversions)	0	2
	No. satellite well sites	0	0
	Avg. wells/satellite site	0	0
	No. devt drilling campaigns (incl. predrilling)	0	3
	Raw gas production capacity, mmscf/d	348	236
	Avg. raw gas production rate, mmscf/d	248	165
	Avg. maximum sales gas rate, TJ/d	218	164
	Peak oil/cond rate, mbd	-	9
	Field life, years	22	17
	Critical oil/gas host/onshore plant arrival pressure, psi	800 at 3:1 comp	900 at 3:1 comp
	Offshore pipeline to onshore plant distance, km	55	15
	Offshore pipeline nominal size, inches	26	24
	Onshore pipeline export distance, km	150	0
	Onshore pipeline nominal size, inches	18	-
	Compression required, year of production	1 & 7	(available for Kipper).

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	2d(iii)	2e
Case definition		
Case reference	2d(iii)	2e
Gas sales, PJ	991.0	430.0
Oil/condensate reserves, mmb	-	18.1
Scheme	M/G/K gas	M/G gas only
Integration	Shared systems - "high" market	Tariff thro' Kipper - "base" market
Products / peak avg. sales rates	80 PJ/yr(310TJ/d MDQ)	60 PJ/yr(230TJ/d MDQ) 2.4 MMstb/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.0	0.5
Appraisal wells	0.0	39.3
Appraisal well conversion(s)	0.0	27.7
Development / commercial planning	1.0	2.0
Predrilled development wells	0.0	0.0
Post start-up development wells	0.0	64.4
Subsea manifold cluster(s)	0.0	60.0
Subsea cluster flowline set(s)	0.0	15.0
Subsea satellite pipeline set(s)	0.0	31.0
Field control / host facility costs (tie-ins / facilities)	0.0	35.0
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	87.1	0.0
Project management	0.9	10.0
Total offshore	*89*	*285*
Onshore		
Development / commercial planning	3.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	196.4	0.0
Compression	56.4	0.0
Export pipeline	69.3	0.0
Project management	27.0	0.0
Total onshore	*352*	*0*
Grand total	***441***	***284.9***
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	0.0	1.8
Offshore facilities	0.2	8.5
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	0.7	3.5
Total offshore	*0.9*	*13.7*
Onshore		
Onshore plant	8.3	0.0
Incremental compression	4.1	0.0
Technical support	2.3	0.0
Total onshore	*14.7*	*0.0*
Grand total	***15.6***	***13.7***
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	0.0	15.0
Offshore facilities	0.2	4.9
Sale value at abandonment	0.0	0.0
Total offshore	*0.2*	*19.9*
Onshore		
Onshore plant	14.0	0.0
Environmental rehabilitation	1.0	0.0
Total onshore	*15.0*	*0.0*
Grand total	***15.2***	***19.9***

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Basker Manta Evaluation
Case Definitions and Costs

Case definition			
	Case reference	2e P85	2e P15
	Gas sales, PJ	290.0	734.0
	Oil/condensate reserves, mmb	12.2	31.8
	Scheme	M/G gas only - P85	M/G gas only - P15
	Integration	Tariff thro' Kipper - "base" market	Tariff thro' Kipper - "base" market
	Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 2.4 MMstb/yr	60 PJ/yr(230TJ/d MDQ) 2.4 MMstb/yr
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	3300 / 3500	3300 / 3500
	No. appraisal wells	3	3
	No. appraisal campaigns	2	2
	Development well TVD, m	3300 / 3500	3300 / 3500
	No. development wells	5	7
	No. appraisal well conversions, dev well s/ts or recomps	2	2
	New production/injection wells	3	5
	No. wells at central site	5	7
	No. predrilled wells (incl. conversions)	2	2
	No. satellite well sites	0	0
	Avg. wells/satellite site	0	0
	No. devt drilling campaigns (incl. predrilling)	2	3
	Raw gas production capacity, mmscf/d	236	236
	Avg. raw gas production rate, mmscf/d	165	165
	Avg. maximum sales gas rate, TJ/d	164	164
	Peak oil/cond rate, mbd	9	9
	Field life, years	13	23
	Critical oil/gas host/onshore plant arrival pressure, psi	900 at 3:1 comp	900 at 3:1 comp
	Offshore pipeline to onshore plant distance, km	15	15
	Offshore pipeline nominal size, inches	24	24
	Onshore pipeline export distance, km	0	0
	Onshore pipeline nominal size, inches	-	-
	Compression required, year of production	(available for Kipper)	(available for Kipper)

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Case Definitions and Costs

	2e P85	2e P15
Case definition		
Case reference	2e P85	2e P15
Gas sales, PJ	290.0	734.0
Oil/condensate reserves, mmb	12.2	31.8
Scheme	M/G gas only - P85	M/G gas only - P15
Integration	Tariff thro' Kipper - "base" market	Tariff thro' Kipper - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 2.4 MMstb/yr	60 PJ/yr(230TJ/d MDQ) 2.4 MMstb/yr

Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	39.3	39.3
Appraisal well conversion(s)	27.7	27.7
Development / commercial planning	2.0	2.0
Predrilled development wells	0.0	48.4
Post start-up development wells	64.4	49.6
Subsea manifold cluster(s)	60.0	84.0
Subsea cluster flowline set(s)	15.0	21.0
Subsea satellite pipeline set(s)	31.0	31.0
Field control / host facility costs (tie-ins / facilities)	35.0	35.0
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	0.0	0.0
Project management	10.0	12.4
Total offshore	*285*	*351*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	*284.9*	*350.9*

Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.8	2.5
Offshore facilities	8.5	10.3
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	3.5	4.0
Total offshore	*13.7*	*16.8*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*13.7*	*16.8*

Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00

Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	15.0	21.0
Offshore facilities	4.9	6.1
Sale value at abandonment	0.0	0.0
Total offshore	*19.9*	*27.1*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*19.9*	*27.1*

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Case Definitions and Costs

Case definition		
Case reference	2e(i)	2e(ii)
Gas sales, PJ	430.0	430.0
Oil/condensate reserves, mmb	18.1	18.1
Scheme	M/G gas only	M/G gas only
Integration	Tariff thro' Kipper - "lo-low" market	Tariff thro' Kipper - "low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 1.8 MMstb/yr	40 PJ/yr(155TJ/d MDQ) 1.4 MMstb/yr
Parameters		
System		
Exploration well TVD, m	-	-
Appraisal well TVD, m	3300 / 3500	3300 / 3500
No. appraisal wells	3	3
No. appraisal campaigns	2	2
Development well TVD, m	3300 / 3500	3300 / 3500
No. development wells	5	5
No. appraisal well conversions, dev well s/ts or recomps	2	2
New production/injection wells	3	3
No. wells at central site	5	5
No. predrilled wells (incl. conversions)	1	1
No. satellite well sites	0	0
Avg. wells/satellite site	0	0
No. devt drilling campaigns (incl. predrilling)	3	3
Raw gas production capacity, mmscf/d	158	158
Avg. raw gas production rate, mmscf/d	112	112
Avg. maximum sales gas rate, TJ/d	109	109
Peak oil/cond rate, mbd	7	5
Field life, years	19	23
Critical oil/gas host/onshore plant arrival pressure, psi	900 at 3:1 comp	900 at 3:1 comp
Offshore pipeline to onshore plant distance, km	15	15
Offshore pipeline nominal size, inches	20	20
Onshore pipeline export distance, km	0	0
Onshore pipeline nominal size, inches	-	-
Compression required, year of production	(available for Kipper)	(available for Kipper)

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Case Definitions and Costs

Case definition		
Case reference	2e(i)	2e(ii)
Gas sales, PJ	430.0	430.0
Oil/condensate reserves, mmb	18.1	18.1
Scheme	M/G gas only	M/G gas only
Integration	Tariff thro' Kipper - "lo-low" market	Tariff thro' Kipper - "low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 1.8 MMstb/yr	40 PJ/yr(155TJ/d MDQ) 1.4 MMstb/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	41.4	41.4
Appraisal well conversion(s)	27.7	27.7
Development / commercial planning	2.0	2.0
Predrilled development wells	18.1	18.1
Post start-up development wells	46.3	46.3
Subsea manifold cluster(s)	60.0	60.0
Subsea cluster flowline set(s)	15.0	15.0
Subsea satellite pipeline set(s)	28.5	28.5
Field control / host facility costs (tie-ins / facilities)	35.0	35.0
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	0.0	0.0
Project management	9.9	9.9
Total offshore	*284*	*284*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	*284*	*284*
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.8	1.8
Offshore facilities	8.4	8.4
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	3.5	3.5
Total offshore	*13.7*	*13.7*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*13.7*	*13.7*
Tariff charges		
Oil, S/bbl	0.00	0.00
Gas, S/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	15.0	15.0
Offshore facilities	4.9	4.9
Sale value at abandonment	0.0	0.0
Total offshore	*19.9*	*19.9*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	*19.9*	*19.9*

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Case definition			
	Case reference	2e(iii)	2f
	Gas sales, PJ	430.0	495.0
	Oil/condensate reserves, mmb	18.1	19
	Scheme	M/G gas only	B/M/G gas only (after oil devt)
	Integration	Tariff thro' Kipper - "high" market	Tariff thro' Kipper - "base" market
	Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 2.0 MMstb/yr	60 PJ/yr(230TJ/d MDQ) 2.5MMstb/yr cond
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	3300 / 3500	3300 / 3500
	No. appraisal wells	3	2
	No. appraisal campaigns	2	2
	Development well TVD, m	3300 / 3500	3300 / 3500
	No. development wells	5	7
	No. appraisal well conversions, dev well s/ts or recomps	2	5
	New production/injection wells	3	2
	No. wells at central site	5	5
	No. predrilled wells (incl. conversions)	1	2
	No. satellite well sites	0	1
	Avg. wells/satellite site	0	2
	No. devt drilling campaigns (incl. predrilling)	3	4
	Raw gas production capacity, mmscf/d	158	236
	Avg. raw gas production rate, mmscf/d	112	165
	Avg. maximum sales gas rate, TJ/d	109	164
	Peak oil/cond rate, mbd	8	10
	Field life, years	19	17
	Critical oil/gas host/onshore plant arrival pressure, psi	900 at 3:1 comp	900 at 3:1 comp
	Offshore pipeline to onshore plant distance, km	15	15
	Offshore pipeline nominal size, inches	20	20
	Onshore pipeline export distance, km	0	0
	Onshore pipeline nominal size, inches	-	-
	Compression required, year of production	(available for Kipper)	(available for Kipper)

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Case Definitions and Costs

Case definition		
Case reference	2e(iii)	2f
Gas sales, PJ	430.0	495.0
Oil/condensate reserves, mmb	18.1	19
Scheme	M/G gas only	B/M/G gas only (after oil devt)
Integration	Tariff thro' Kipper - "high" market	Tariff thro' Kipper - "base" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 2.0 MMstb/yr	60 PJ/yr(230TJ/d MDQ) 2.5MMstb/yr cond
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.0
Appraisal wells	41.4	34.6
Appraisal well conversion(s)	27.7	44.0
Development / commercial planning	2.0	2.0
Predrilled development wells	18.1	0.0
Post start-up development wells	46.3	46.3
Subsea manifold cluster(s)	60.0	84.0
Subsea cluster flowline set(s)	15.0	21.0
Subsea satellite pipeline set(s)	28.5	41.5
Field control / host facility costs (tie-ins / facilities)	35.0	35.0
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	0.0	0.0
Project management	9.9	12.5
Total offshore	*284*	*321*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal. LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	***284***	***321***
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.8	2.5
Offshore facilities	8.4	10.4
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	3.5	3.8
Total offshore	*13.7*	*16.7*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***13.7***	***16.7***
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	15.0	21.0
Offshore facilities	4.9	6.1
Sale value at abandonment	0.0	0.0
Total offshore	*19.9*	*27.1*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***19.9***	***27.1***

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Case Definitions and Costs

Case definition		
Case reference	2g	2i
Gas sales, PJ	495.0	23.0
Oil/condensate reserves, mmb	36.9	24.8
Scheme	B/M oil + B/M/G gas	B/M oil - water inj
Integration	Tariff thro' Kipper - "base market"	Tuna satellite
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 9.0MMstb/yr oil + 2.5MMstb/yr cond	50 mbd water inj 9.0MMstb/yr, 7PJ/yr
Parameters		
System		
Exploration well TVD, m	-	-
Appraisal well TVD, m	3200 / 3300 / 3500	3200
No. appraisal wells	3	1
No. appraisal campaigns	2	1
Development well TVD, m	3200 / 2850 / 3300 / 3500	3200 / 2850
No. development wells	9	4
No. appraisal well conversions, dev well s/ts or recomps	2 / 5	2
New production/injection wells	3 / 2	3
No. wells at central site	3 / 5	3
No. predrilled wells (incl. conversions)	4 / 2	3
No. satellite well sites	1 / 1	1
Avg. wells/satellite site	1 / 2	1
No. devt drilling campaigns (incl. predrilling)	2 / 4	2
Raw gas production capacity, mmscf/d	236	70
Avg. raw gas production rate, mmscf/d	165	70
Avg. maximum sales gas rate, TJ/d	164	65
Peak oil/cond rate, mbd	25 / 10	30
Field life, years	4 years > 5mbd oil + 17 years gas	9years > 1mbd
Critical oil/gas host/onshore plant arrival pressure, psi	400 / 900 at 3:1 comp	150
Offshore pipeline to onshore plant distance, km	0	29
Offshore pipeline nominal size, inches	0	12
Onshore pipeline export distance, km	0	0
Onshore pipeline nominal size, inches	-	-
Compression required, year of production	-	-

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Case Definitions and Costs

	2g	2i
Case definition		
Case reference	2g	2i
Gas sales, PJ	495.0	23.0
Oil/condensate reserves, mmb	36.9	24.8
Scheme	B/M oil + B/M/G gas	B/M oil - water inj
Integration	Tariff thro' Kipper - "base market"	Tuna satellite
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)	50 mbd water inj
	9.0MMstb/yr oil + 2.5MMstb/yr cond	9.0MMstb/yr; 7PJ/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	48.3	13.7
Appraisal well conversion(s)	54.5	10.5
Development / commercial planning	3.0	1.0
Predrilled development wells	43.7	43.7
Post start-up development wells	54.9	8.6
Subsea manifold cluster(s)	84.0	22.9
Subsea cluster flowline set(s)	21.0	8.4
Subsea satellite pipeline set(s)	66.0	68.4
Field control / host facility costs (tie-ins / facilities)	37.3	31.8
FPSO mobilisation / supply	10.0	0.0
Main export pipeline/control umbilical	0.0	0.0
Project management	14.0	6.2
Total offshore	*437*	*216*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	***437***	***216***
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	-	1.8
Offshore facilities	-	4.5
Leased / project owned FPSO	-	0.0
Technical support/offshore logistics base/insurance	-	3.0
Total offshore	*0.0*	*9.3*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***0.0***	***9.3***
Tariff charges		
Oil, $/bbl	0.00	1.50
Gas, $/GJ	0.00	0.60
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	27.0	12.0
Offshore facilities	6.8	2.9
Sale value at abandonment	0.0	0.0
Total offshore	*33.8*	*14.9*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***33.8***	***14.9***

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Case Definitions and Costs

Case definition			
	Case reference	2i P85	2i P15
	Gas sales, PJ	14.9	32.8
	Oil/condensate reserves, mmb	16.7	35.6
	Scheme	B/M oil - water inj - P85	B/M oil - water inj - P15
	Integration	Tuna satellite	Tuna satellite
	Products / peak avg. sales rates	50 mbd water inj 9.0MMstb/yr; 7PJ/yr	50 mbd water inj 9.0MMstb/yr; 9PJ/yr
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	3200	3200
	No. appraisal wells	1	1
	No. appraisal campaigns	1	1
	Development well TVD, m	3200 / 2850	3200 / 2850
	No. development wells	4	4
	No. appraisal well conversions, dev well s/ts or recomps	2	3
	New production/injection wells	3	3
	No. wells at central site	3	3
	No. predrilled wells (incl. conversions)	3	3
	No. satellite well sites	1	1
	Avg. wells/satellite site	1	1
	No. devt drilling campaigns (incl. predrilling)	2	2
	Raw gas production capacity, mmscf/d	70	70
	Avg. raw gas production rate, mmscf/d	70	70
	Avg. maximum sales gas rate, TJ/d	65	65
	Peak oil/cond rate, mbd	30	30
	Field life, years	7years > 1mbd	12years > 1mbd
	Critical oil/gas host/onshore plant arrival pressure, psi	150	150
	Offshore pipeline to onshore plant distance, km	29	29
	Offshore pipeline nominal size, inches	12	12
	Onshore pipeline export distance, km	0	0
	Onshore pipeline nominal size, inches	-	-
	Compression required, year of production	-	-

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Case Definitions and Costs

Case definition		
Case reference	2i P85	2i P15
Gas sales, PJ	14.9	32.8
Oil/condensate reserves, mmb	16.7	35.6
Scheme	B/M oil - water inj - P85	B/M oil - water inj - P15
Integration	Tuna satellite	Tuna satellite
Products / peak avg. sales rates	50 mbd water inj	50 mbd water inj
	9.0MMstb/yr, 7PJ/yr	9.0MMstb/yr, 9PJ/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	13.7	13.7
Appraisal well conversion(s)	10.5	10.5
Development / commercial planning	1.0	1.0
Predrilled development wells	43.7	43.7
Post start-up development wells	8.6	16.5
Subsea manifold cluster(s)	22.9	22.9
Subsea cluster flowline set(s)	8.4	8.4
Subsea satellite pipeline set(s)	68.4	68.4
Field control / host facility costs (tie-ins / facilities)	31.8	31.8
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	0.0	0.0
Project management	6.2	6.2
Total offshore	*216*	*224*
Onshore		
Development / commercial planning	0.0	0.0
Gas plant (incl. CO2 removal, LPG extraction)	0.0	0.0
Compression	0.0	0.0
Export pipeline	0.0	0.0
Project management	0.0	0.0
Total onshore	*0*	*0*
Grand total	***216***	***224***
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	1.8	1.8
Offshore facilities	4.5	4.5
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	3.0	3.1
Total offshore	*9.3*	*9.3*
Onshore		
Onshore plant	0.0	0.0
Incremental compression	0.0	0.0
Technical support	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***9.3***	***9.3***
Tariff charges		
Oil, S/bbl	1.50	1.50
Gas, S/GJ	0.60	0.60
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	12.0	12.0
Offshore facilities	2.9	2.9
Sale value at abandonment	0.0	0.0
Total offshore	*14.9*	*14.9*
Onshore		
Onshore plant	0.0	0.0
Environmental rehabilitation	0.0	0.0
Total onshore	*0.0*	*0.0*
Grand total	***14.9***	***14.9***

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Case Definitions and Costs

	3b	3b(i)
Case definition		
Case reference	3b	3b(i)
Gas sales, PJ	991.0	991.0
Oil/condensate reserves, mmb	29.1	29.1
Scheme	K + M/G gas only - "base" market	K + M/G gas only - "lo-low" market
Integration	Shared (no tariff) common systems	Shared (no tariff) common systems
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 1.8 MMstb/yr	40 PJ/yr(155TJ/d MDQ) 1.8 MMstb/yr
Parameters		
System	-	-
Exploration well TVD, m		
Appraisal well TVD, m	0 / 3300 / 3500	0 / 3300 / 3500
No. appraisal wells	0 / 3	0 / 3
No. appraisal campaigns	0 / 2	0 / 2
Development well TVD, m	2300 / 3300 / 3500	2300 / 3300 / 3500
No. development wells	4 / 5	3 / 5
No. appraisal well conversions, dev well s/ts or recomps	0 / 2	0 / 2
New production/injection wells	4 / 3	3 / 3
No. wells at central site	4 / 5	3 / 5
No. predrilled wells (incl. conversions)	3 / 2	3 / 1
No. satellite well sites	0 / 0	0 / 0
Avg. wells/satellite site	0 / 0	0 / 0
No. devt drilling campaigns (incl. predrilling)	2 / 3	1 / 3
Raw gas production capacity, mmscf/d	260 / 236	174 / 158
Avg. raw gas production rate, mmscf/d	185 / 165	124 / 112
Avg. maximum sales gas rate, TJ/d	164 / 164	109 / 109
Peak oil/cond rate, mbd	5 / 9	3 / 7
Field life, years	12 / 17	17 / 19
Critical oil/gas host/onshore plant arrival pressure, psi	800 at 3:1 comp / 900 at 3:1 comp	800 at 3:1 comp / 900 at 3:1 comp
Offshore pipeline to onshore plant distance, km	0 / 15	0 / 15
Offshore pipeline nominal size, inches	0 / 24	0 / 20
Onshore pipeline export distance, km	0 / 0	0 / 0
Onshore pipeline nominal size, inches	-	-
Compression required, year of production	-	-

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Basker Manta Evaluation
Case Definitions and Costs

Case definition		
Case reference	3b	3b(i)
Gas sales, PJ	991.0	991.0
Oil/condensate reserves, mmb	29.1	29.1
Scheme	K + M/G gas only - "base" market	K + M/G gas only - "lo-low" market
Integration	Shared (no tariff) common systems	Shared (no tariff) common systems
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 1.8 MMstb/yr	40 PJ/yr(155TJ/d MDQ) 1.8 MMstb/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	39.3	41.4
Appraisal well conversion(s)	27.7	27.7
Development / commercial planning	5.0	5.0
Predrilled development wells	45.0	63.1
Post start-up development wells	79.4	46.3
Subsea manifold cluster(s)	108.0	96.0
Subsea cluster flowline set(s)	27.0	24.0
Subsea satellite pipeline set(s)	31.0	28.5
Field control / host facility costs (tie-ins / facilities)	37.3	37.3
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	91.6	82.9
Project management	16.0	14.7
Total offshore	*508*	*467*
Onshore		
Development / commercial planning	3.0	3.0
Gas plant (incl. CO2 removal, LPG extraction)	160.0	123.6
Compression	42.0	27.3
Export pipeline	64.4	59.5
Project management	21.8	16.6
Total onshore	*291*	*230*
Grand total	*799*	*697*
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	3.2	2.8
Offshore facilities	12.6	11.7
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	6.6	6.3
Total offshore	*22.4*	*20.8*
Onshore		
Onshore plant	7.0	5.4
Incremental compression	3.2	2.0
Technical support	2.0	1.7
Total onshore	*12.1*	*9.0*
Grand total	***34.5***	***29.8***
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	27.0	24.0
Offshore facilities	7.6	7.0
Sale value at abandonment	0.0	0.0
Total offshore	*34.6*	*31.0*
Onshore		
Onshore plant	11.7	8.8
Environmental rehabilitation	1.0	1.0
Total onshore	*12.7*	*9.8*
Grand total	***47.3***	***40.8***

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Shell Development Australia
Basker Manta Evaluation
Case Definitions and Costs

Case definition			
	Case reference	3b(ii)	3b(iii)
	Gas sales, PJ	991.0	991.0
	Oil/condensate reserves, mmb	29.1	29.1
	Scheme	K + M/G gas only - "low" market	K + M/G gas only - "high" market
	Integration	Shared (no tariff) common systems	Shared (no tariff) common systems
	Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 1.8 MMstb/yr	80 PJ/yr(310TJ/d MDQ) 2.7 MMstb/yr
Parameters			
	System		
	Exploration well TVD, m	-	-
	Appraisal well TVD, m	0 / 3300 / 3500	0 / 3300 / 3500
	No. appraisal wells	0 / 3	0 / 3
	No. appraisal campaigns	0 / 2	0 / 2
	Development well TVD, m	2300 / 3300 / 3500	2300 / 3300 / 3500
	No. development wells	3 / 5	4 / 5
	No. appraisal well conversions, dev well s/ts or recomps	0 / 2	0 / 2
	New production/injection wells	3 / 3	4 / 3
	No. wells at central site	3 / 5	4 / 5
	No. predrilled wells (incl. conversions)	3 / 1	3 / 1
	No. satellite well sites	0 / 0	0 / 0
	Avg. wells/satellite site	0 / 0	0 / 0
	No. devt drilling campaigns (incl. predrilling)	1 / 3	2 / 3
	Raw gas production capacity, mmscf/d	174 / 158	260 / 158
	Avg. raw gas production rate, mmscf/d	124 / 112	185 / 112
	Avg. maximum sales gas rate, TJ/d	109 / 109	164 / 109
	Peak oil/cond rate, mbd	3 / 5	5 / 8
	Field life, years	17 / 23	12 / 19
	Critical oil/gas host/onshore plant arrival pressure, psi	800 at 3:1 comp / 900 at 3:1 comp	800 at 3:1 comp / 900 at 3:1 comp
	Offshore pipeline to onshore plant distance, km	0 / 15	0 / 15
	Offshore pipeline nominal size, inches	0 / 20	0 / 20
	Onshore pipeline export distance, km	0 / 0	0 / 0
	Onshore pipeline nominal size, inches	-	-
	Compression required, year of production	-	-

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Basker Manta Evaluation

Case Definitions and Costs

Case definition		
Case reference	3b(ii)	3b(iii)
Gas sales, PJ	991.0	991.0
Oil/condensate reserves, mmb	29.1	29.1
Scheme	K + M/G gas only - "low" market	K + M/G gas only - "high" market
Integration	Shared (no tariff) common systems	Shared (no tariff) common systems
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 1.8 MMstb/yr	80 PJ/yr(310TJ/d MDQ) 2.7 MMstb/yr
Capital costs, A$mm (1.1.98) - most likely		
Offshore		
Exploration well (tested)	0.0	0.0
Appraisal drilling template(s)	0.5	0.5
Appraisal wells	41.4	41.4
Appraisal well conversion(s)	27.7	27.7
Development / commercial planning	5.0	5.0
Predrilled development wells	63.1	63.1
Post start-up development wells	46.3	61.3
Subsea manifold cluster(s)	96.0	108.0
Subsea cluster flowline set(s)	24.0	27.0
Subsea satellite pipeline set(s)	28.5	28.5
Field control / host facility costs (tie-ins / facilities)	37.3	37.3
FPSO mobilisation / supply	0.0	0.0
Main export pipeline/control umbilical	91.6	95.7
Project management	14.8	16.0
Total offshore	*476*	*512*
Onshore		
Development / commercial planning	3.0	3.0
Gas plant (incl. CO2 removal, LPG extraction)	162.7	196.4
Compression	43.6	56.4
Export pipeline	64.4	69.3
Project management	22.2	27.0
Total onshore	*296*	*352*
Grand total	***772***	***864***
Peak operating costs, A$mm/yr (1.1.98) - most likely		
Offshore		
Wells (annual average)	2.8	3.2
Offshore facilities	11.7	12.6
Leased / project owned FPSO	0.0	0.0
Technical support/offshore logistics base/insurance	6.4	6.6
Total offshore	*20.9*	*22.4*
Onshore		
Onshore plant	7.0	8.3
Incremental compression	3.2	4.1
Technical support	2.0	2.3
Total onshore	*12.1*	*14.7*
Grand total	***33.0***	***37.1***
Tariff charges		
Oil, $/bbl	0.00	0.00
Gas, $/GJ	0.00	0.00
Abandonment costs, A$mm (1.1.98)		
Offshore		
Wells	24.0	27.0
Offshore facilities	7.0	7.6
Sale value at abandonment	0.0	0.0
Total offshore	*31.0*	*34.6*
Onshore		
Onshore plant	11.6	14.0
Environmental rehabilitation	1.0	1.0
Total onshore	*12.6*	*15.0*
Grand total	***43.7***	***49.7***

Appendix B

Phased Activity, Production and Cost Data Sheets

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Basker Manta Evaluation

Case 1a

Case definition

Gas sales, PJ	
Oil/cond/LPG reserves, mmb	17.9
Scheme	B/M oil - gas inj
Integration	Standalone leased FPSO
Products / peak avg. sales rates	40 mmscf/d gas inj
	9.0MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Basker appraisal well; PSA 1/10/99	1999					1		14		3				
2xB hor.well(1convn)+1xgas inj; 1xM app/hor. dev well	2000						3 + 1c		54	28				
RFSU 1/1/2001	2001	7.59								9		49.4		
Vert. S/T of 1 x Basker well; Manta RFSU	2002	4.22					1st		9			49.7		
	2003	3.42										50 1		
	2004	2.67										50.1		12.7
Presumed uneconomic beyond end 2004	2005													
	2006													
	2007													
	2008													
	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**18**				**1**		**14**	**63**	**39**		**199**		**13**

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Basker Manta Evaluation

Case 1a P85

Case definition

Gas sales, PJ	
Oil/cond/LPG reserves, mmb	11.9
Scheme	B/M oil - gas inj - P85
Integration	Standalone leased FPSO
Products / peak avg. sales rates	40 mmscf/d gas inj 9.0MMstb/yr

Activity	Year	Sales Oil/cond Mstb/yr	Sales LPG kT/yr	Sales Gas PJ/yr	Well schedule Expln	Well schedule Appl	Well schedule Devt	Capital costs, A$mm 1998 Offshore Wells E & A	Capital costs, A$mm 1998 Offshore Wells Devt	Capital costs, A$mm 1998 Offshore Facs	Capital costs, A$mm 1998 Onshore Facs	Operating costs, A$mm 1998 Offshore	Operating costs, A$mm 1998 Onshore	Abandonment costs, A$mm 1998
Basker appraisal well; PSA 1/10/99	1999					1		14		3				
2xB hor.well(1convn)+1xgas inj; 1xM app/hor. dev well	2000						3 + 1c		54	28				
RFSU 1/1/2001	2001	6.38								9		49.4		
Vert. S/T of 1 x Basker well; Manta RFSU	2002	2.91					1st		9			49.7		
	2003	2.65										50.1		
Presumed uneconomic beyond end 2003	2004													12.7
	2005													
	2006													
	2007													
	2008													
	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
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	2019													
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	2021													
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	2023													
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	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	12				1		14	63	39		149		13

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Basker Manta Evaluation

Case 1a P15

Case definition

Gas sales, PJ	
Oil/cond/LPG reserves, mmb	26
Scheme	B/M oil - gas inj - P15
Integration	Standalone leased FPSO
Products / peak avg. sales rates	40 mmscf/d gas inj 9.0MMstb/yr

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
Basker appraisal well; PSA 1/10/99	1999					1		14		3				
2xB hor.well(1convn)+1xgas inj; 1xM app/hor. dev well	2000						3+1c		54	28				
RFSU 1/1/2001	2001	8.26								9		49.2		
Manta RFSU	2002	5.51										49.5		
Vert. S/T of 2 x Basker wells to deeper LaTrobe	2003	3.58					2st		16			49.5		
	2004	3.48										50.1		
	2005	2.92										50.1		
	2006	2.27										50.1		12.7
Presumed uneconomic beyond end 2006	2007													
	2008													
	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
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	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	26				1		14	71	39		299		13

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Basker Manta Evaluation

Case 1a(owned)

Case definition

Gas sales, PJ	
Oil/cond/LPG reserves, mmb	20.4
Scheme	B/M oil - gas inj
Integration	Standalone project owned FPSO
Products / peak avg. sales rates	40 mmscf/d gas inj 9.0MMstb/yr

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
Basker appraisal well; PSA 1/10/99	1999					1		14		14				
2xB hor.well(1convn)+1xgas inj; 1xM app/hor. dev well	2000						3 + 1c		54	108				
RFSU 1/1/2001	2001	7.59								9		18.2		
Vert. S/T of 1 x Basker well; Manta RFSU	2002	4.22					1st		9			19.1		
	2003	3.42										19.9		
	2004	2.67										18.9		
	2005	1.35										18.0		
	2006	1.14										17.1		
Presumed uneconomic beyond end 2006	2007													-8.2
	2008													
	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
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	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**20**				**1**		**14**	**63**	**131**		**111**		**-8**

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Basker Manta Evaluation

Case 1b

Case definition

Gas sales, PJ	-
Oil/cond/LPG reserves, mmb	5.1
Scheme	K oil - gas inj
Integration	andalone leased FPSO
Products / peak avg. sales rates	2.8MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
	1999									3				
PSA 1/10/99	2000						5h + 1 inj		82	34				
5 x hor.wells + 1 gas injection well	2001	2.77								0		48.4		
Kipper oil RFSU 1/1/2001	2002	2.26										48.4		
	2003	1.72										48.4		
Presumed not economic beyond 2002	2004													18.6
	2005													
	2006													
	2007													
	2008													
	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
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	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	7							82	38		145		19

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Basker Manta Evaluation

Case 1c

Case definition

Gas sales, PJ	430
Oil/cond/LPG reserves, mmb	18
Scheme	M/G gas only
Integration	Standalone off/onshore
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ)
	1.8 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Gummy appraisal well	1999					1		15		1				
	2000													
1 appraisal each in Gummy and Manta	2001					2		24						
	2002									2	1			
PSA 1.1.2003	2003									75	76			
2 x G hor. appl well convs; 1 x M hor.well	2004						2hc+1h		45	130	138			
Gummy/Manta RFSU 1/1/2005	2005	1.83	136.8	40.0								11.6	8.6	
1 x M hor.well (extended reach well)	2006	1.84	137.2	40.0			1h		31	3	3	11.6	8.6	
	2007	1.84	137.2	40.0							12	12.9	8.7	
2nd stage onshore compression RFSU	2008	1.84	137.6	40.0								12.9	9.2	
	2009	1.84	137.2	40.0								12.9	9.2	
1 x M hor. well	2010	1.84	137.2	40.0			1h		16	3		12.9	9.2	
	2011	1.55	125.2	39.4								13.7	9.2	
	2012	1.28	104.8	33.4								13.7	9.2	
	2013	1.06	88.3	28.6								13.7	9.2	
	2014	0.88	75.2	24.8								13.7	9.2	
	2015	0.75	65.4	22.0								13.7	9.2	
	2016	0.62	52.1	17.0								13.7	9.2	
	2017	0.48	36.0	10.5								13.7	9.2	
	2018	0.18	13.1	3.8								13.7	9.2	
	2019	0.14	10.2	3.0								13.7	9.2	
	2020	0.11	8.0	2.3								13.0	8.8	
	2021	0.08	6.2	1.8								12.3	8.3	
	2022	0.06	4.8	1.4								11.7	7.9	
	2023	0.05	3.8	1.1								11.1	7.5	
	2024	0.04	3.0	0.9								10.6	7.1	
Abandonment	2025													30.7
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**18**	**1419**	**430**		**3**		**39**	**92**	**214**	**230**	**256**	**176**	**31**

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Basker Manta Evaluation

Case 1d

Case definition

Gas sales, PJ	561
Oil/cond/LPG reserves, mmb	11
Scheme	Kipper gas only
Integration	Standalone off/onshore
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)
	1.2 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
	1999									2	2			
Kipper PSA 1/1/2000	2000									54	96			
3 x Kipper vert wells	2001						3		45	102	170			
Kipper RFSU 1/1/2002	2002	1.16	149.5	60 0								7.9	11.2	
1 x Kipper vert. well	2003	1.16	149.9	60 0			1		15	3		7.9	11.2	
	2004	1 16	150.3	60.0								8 6	11.2	
	2005	1.16	149.9	60 0								8.6	11.2	
	2006	1.16	149.9	60.0							5	8.6	11.2	
	2007	1.16	149.9	60.0							18	8 6	11.4	
2nd stage onshore compression RFSU	2008	1.16	150.3	60.0								8.6	12.2	
	2009	1.16	149.9	60.0								8.2	11.6	
	2010	0 71	91.4	36.6								7.8	11.0	
	2011	0.43	55.8	22.3								7.4	10.4	
	2012	0.26	34.1	13.6								7.0	9.9	
	2013	0 16	20.8	8.3								6.7	9.4	
Abandonment	2014													26.5
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**11**	**1402**	**561**			**4**		**60**	**161**	**291**	**96**	**132**	**27**

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Basker Manta Evaluation

Case 2a

Case definition

Gas sales, PJ	-
Oil/cond/LPG reserves, mmb	31
Scheme	K/B/M oil only
Integration	Shared leased FPSO
Products / peak avg. sales rates	-

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
	1999									1				
	2000									10				
Basker/Manta RFSU RFSU 1/1/2001	2001	7.59								0		47.1		
Kipper RFSU 1/1/2002	2002	6.99										47.1		
	2003	5.68										47.1		
	2004	4.39										47.1		
	2005	3.58										47.1		
	2006	2.82										47.1		
Presumed uneconomic beyond end 2006	2007													0.5
	2008													
	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	31								12		283		1

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Shell Development Australia
Basker Manta Evaluation
Case 2b

Case definition

Gas sales, PJ	-
Oil/cond/LPG reserves, mmb	11.5
Scheme	K oil - gas inj at B/M
Integration	S'sea satellite - tariff thro' B/M
Products / peak avg. sales rates	2 8MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
PSA 1/10/99	1999									18				
	2000						5h		76	25		0.8		
5 x hor.wells (B/M RFSU 1/1/2001)	2001	2.77										5.0		
Kipper oil RFSU 1/1/2002	2002	2.26					2rc		7			5.0		
Recomplete 2 wells to LaTrobe	2003	1.72										5.3		
	2004	2 23										5.0		
	2005	1.68										4.8		
	2006	0.80												16.2
Presumed uneconomic beyond end 2006	2007													
(as a product of K + B/M production)	2008													
	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**11**							**82**	**43**		**26**		**16**

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Shell Development Australia

Basker Manta Evaluation

Case 2c, 2c(iii)

Case definition

Gas sales, PJ	561
Oil/cond/LPG reserves, mmb	11
Scheme	Kipper gas only
Integration	hared export system - "base/high" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)
	1.2 MMstb/yr

Activity	Year	Sales Oil/cond Mstb/yr	Sales LPG kT/yr	Sales Gas PJ/yr	Well schedule Expln	Well schedule Appl	Well schedule Devt	Capital costs, A$mm 1998 Offshore Wells E & A	Capital costs, A$mm 1998 Offshore Wells Devt	Capital costs, A$mm 1998 Offshore Facs	Capital costs, A$mm 1998 Onshore Facs	Operating costs, A$mm 1998 Offshore	Operating costs, A$mm 1998 Onshore	Abandonment costs, A$mm 1998
	1999									2				
Kipper PSA 1/1/2000	2000									29				
3 x Kipper vert wells	2001						3		45	44				
Kipper RFSU 1/1/2002	2002	1.16	149.5	60.0						0		6.8		
1 x Kipper vert. well	2003	1.16	149.9	60.0			1		15	3		6.8		
	2004	1.16	150.3	60.0								7.8		
	2005	1.16	149.9	60.0								7.8		
	2006	1.16	149.9	60.0								7.8		
	2007	1.16	149.9	60.0								7.8		
2nd stage onshore compression RFSU	2008	1.16	150.3	60.0								7.8		
	2009	1.16	149.9	60.0								7.4		
	2010	0.71	91.4	36.6								7.0		
	2011	0.43	55.8	22.3								6.7		
	2012	0.26	34.1	13.6								6.4		
	2013	0.16	20.8	8.3								6.0		
Abandonment	2014													14.6
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	11	1402	561			4		60	78		86		15

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Basker Manta Evaluation

Case 2c(i), 2c(ii)

Case definition

Gas sales, PJ	561
Oil/cond/LPG reserves, mmb	11
Scheme	Kipper gas only
Integration	Tariff thro' shared export system - "low/lo-low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 0.8 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
	1999									2				
Kipper PSA 1/1/2000	2000									23				
3 x Kipper vert wells	2001						3		45	38				
Kipper RFSU 1/1/2002	2002	0.77	99.7	40.0						0		6.3		
	2003	0.77	99.9	40.0								6.3		
	2004	0.77	100.2	40.0								6.3		
	2005	0.77	99.9	40.0								6.3		
	2006	0.77	99.9	40.0								6.3		
	2007	0.77	99.9	40.0								6.3		
	2008	0.77	100.2	40.0								6.3		
	2009	0.77	99.9	40.0								6.3		
2nd stage onshore compression RFSU	2010	0.77	99.9	40.0								6.3		
	2011	0.77	99.9	40.0								6.3		
	2012	0.77	100.2	40.0								6.3		
	2013	0.77	99.9	40.0								6.0		
	2014	0.67	86.2	34.5								5.7		
	2015	0.41	52.6	21.0								5.4		
	2016	0.25	32.2	12.8								5.2		
	2017	0.15	19.6	7.8								4.9		
	2018	0.09	11.9	4.8										
Abandonment	2019													11.0
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	11	1402	561			3		45	63		103		11

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Shell Development Australia

Basker Manta Evaluation

Case 2d

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	-
Scheme	M/G/K gas
Integration	Shared systems - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
	1999										2			
Kipper PSA 1/1/2000	2000									30	96			
	2001									55	170			
Kipper RFSU 1/1/2002	2002			60.0								0.8	11.2	
	2003			60.0								0.8	11.2	
	2004			60.0								0.8	11.2	
	2005			60.0								0.8	11.2	
	2006			60.0							5	0.8	11.2	
	2007			60.0							18	0.8	11.4	
2nd stage onshore compression RFSU	2008			60.0								0 8	12.1	
	2009			60.0								0.8	12.1	
Gummy RFSU 1/1/2010	2010			60.0								0.8	12.1	
Manta RFSU 1/1/2011	2011			60 0								0.8	12.1	
	2012			60.0								0.8	12.1	
	2013			60.0								0.8	12.1	
	2014			60.0								0.8	12.1	
	2015			48.2								0.8	12.1	
	2016			39.3								0.8	12.1	
	2017			32 6								0.8	12.1	
	2018			27.5								0.8	12.1	
	2019			20.0								0.8	12.1	
	2020			15.3								0.8	12.1	
	2021			11.1								0.8	12.1	
	2022			9.4								0.8	11.5	
	2023			2.8								0.8	11.0	
	2024			2 1								0.7	10.4	
	2025			1.6								0.7	9.9	
	2026			1 2								0.7	9.4	
System abandonment	2027													12.9
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals			**991**						**85**	**291**	**21**	**289**	**13**

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Shell Development Australia
Basker Manta Evaluation
Case 2d P85

Case definition

Gas sales, PJ	720
Oil/cond/LPG reserves, mmb	-
Scheme	M/G/K gas - P85
Integration	Shared systems - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
	1999										2			
Kipper PSA 1/1/2000	2000									30	96			
	2001									55	170			
Kipper RFSU 1/1/2002	2002			60.0								0.8	11.2	
	2003			60.0								0 8	11.2	
	2004			60 0							5	0 8	11.2	
	2005			60.0							18	0.8	11.4	
2nd stage onshore compression RFSU	2006			60 0								0.8	12.1	
	2007			60 0								0.8	12.1	
Manta RFSU 1/1/2008	2008			60.0								0.8	12.1	
Gummy RFSU 1/1/2009	2009			60.0								0.8	12.1	
	2010			59.9								0.8	12.1	
	2011			50.4								0.8	12.1	
	2012			38.7								0.8	12.1	
	2013			27.9								0.8	12.1	
	2014			23.2								0.8	12.1	
	2015			16.3								0.8	12.1	
	2016			10.2								0.8	12.1	
	2017			8 3								0.8	11.5	
	2018			2.0								0.8	11.0	
	2019			1.4								0.7	10.4	
	2020			1.0								0.7	9.9	
	2021			0.8								0.7	9.4	
System abandonment	2022													12.9
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals			**720**						**85**	**291**	**16**	**231**	**13**

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Basker Manta Evaluation

Case 2d P15

Case definition

Gas sales, PJ	1443
Oil/cond/LPG reserves, mmb	-
Scheme	M/G/K gas - P15
Integration	Shared systems - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
	1999										2			
Kipper PSA 1/1/2000	2000									30	96			
	2001									55	170			
Kipper RFSU 1/1/2002	2002			60.0								0.8	11.2	
	2003			60.0								0.8	11.2	
	2004			60.0								0.8	11.2	
	2005			60.0								0.8	11.2	
	2006			60.0								0.8	11.2	
	2007			60.0								0.8	11.2	
	2008			60.0							5	0.8	11.2	
	2009			60.0							18	0.8	11.4	
2nd stage onshore compression RFSU	2010			60.0								0.8	12.1	
	2011			60.0								0.8	12.1	
Manta RFSU 1/1/2012	2012			60.0								0.8	12.1	
	2013			60.0								0.8	12.1	
Gummy RFSU 1/1/2014	2014			60.0								0.8	12.1	
	2015			60.0								0.8	12.1	
	2016			60.0								0.8	12.1	
	2017			59.8								0.8	12.1	
	2018			60.0								0.8	12.1	
	2019			59.5								0.8	12.1	
	2020			56.5								0.8	12.1	
	2021			49.9								0.8	12.1	
	2022			46.2								0.8	12.1	
	2023			41.0								0.8	12.1	
	2024			37.8								0.8	12.1	
	2025			31.3								0.8	12.1	
	2026			27.2								0.8	12.1	
	2027			16.1								0.8	12.1	
	2028			14.7								0.8	12.1	
	2029			13.8								0.8	12.1	
	2030			6.6								0.8	11.5	
	2031			6.2								0.8	11.0	
	2032			5.9								0.7	10.4	
	2033			5.5								0.7	9.9	
	2034			5.1								0.7	9.4	
System abandonment	2035													12.9
	Totals			**1443**						**85**	**291**	**27**	**385**	**13**

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Basker Manta Evaluation
Case 2d(i)

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	-
Scheme	M/G/K gas
Integration	Shared systems - "lo-low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ)

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
	1999										2			
	2000									27	77			
	2001									49	136			
Kipper RFSU 1/1/2002	2002			40.0								0.8	8.4	
	2003			40.0								0.8	8.4	
	2004			40.0								0.8	8.4	
	2005			40.0								0.8	8.4	
	2006			40.0								0.8	8.4	
	2007			40.0								0.8	8.4	
	2008			40.0								0.8	8.4	
	2009			40.0								0.8	8.4	
	2010			40.0							3	0.8	8.4	
	2011			40.0							12	0.8	8.6	
Onshore suction compression reqd	2012			40.0								0.8	9.0	
	2013			40.0								0.8	9.0	
Manta RFSU 1/1/2014	2014			40.0								0.8	9.0	
	2015			40.0								0.8	9.0	
	2016			40.0								0.8	9.0	
	2017			40.0								0.8	9.0	
Gummy RFSU 1/1/2018	2018			40.0								0.8	9.0	
	2019			40.0								0.8	9.0	
	2020			40.0								0.8	9.0	
	2021			40.0								0.8	9.0	
	2022			39.0								0.8	9.0	
	2023			31.3								0.8	9.0	
	2024			27.9								0.8	9.0	
	2025			25.2								0.8	9.0	
	2026			19.4								0.8	9.0	
	2027			13.8								0.7	8.6	
	2028			12.2								0.7	8.2	
	2029			10.8								0.7	7.7	
	2030			5.7								0.6	7.4	
	2031			5.2								0.6	7.0	
Abandonment	2032													10.0
	2033													
	2034													
	2035													
	Totals			990						76	230	22	259	10

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Basker Manta Evaluation

Case 2d(ii)

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	-
Scheme	M/G/K gas
Integration	Shared systems - "low" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
	1999										3			
	2000									30	78			
	2001									55	139			
Kipper RFSU 1/1/2002	2002			40.0								0.8	9.0	
	2003			40.0							18	0.8	9.0	
	2004			40.0							26	0.8	9.7	
Manta RFSU 1/1/2005	2005			60.0								0.8	10.8	
	2006			60.0								0.8	10.8	
	2007			60.0								0.8	10.8	
	2008			60.0							7	0.8	10.8	
	2009			60.0							26	0.8	11.1	
Onshore suction compression reqd	2010			60.0								0.8	12.1	
	2011			60.0								0.8	12.1	
	2012			60.0								0.8	12.1	
	2013			60.0								0.8	12.1	
Gummy RFSU 1/1/2014	2014			60.0								0.8	12.1	
	2015			57.3								0.8	12.1	
	2016			46.2								0.8	12.1	
	2017			39.1								0.8	12.1	
	2018			34.5								0.8	12.1	
	2019			22.2								0.8	12.1	
	2020			16.4								0.8	12.1	
	2021			12.8								0.8	12.1	
	2022			9.5								0.8	12.1	
	2023			8.4								0.8	11.5	
	2024			7.5								0.8	11.0	
	2025			6.7								0.7	10.4	
	2026			6.0								0.7	9.9	
	2027			5.2								0.7	9.4	
Abandonment	2028													12.8
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals			992						85	297	21	292	13

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Basker Manta Evaluation

Case 2d(iii)

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	-
Scheme	M/G/K gas
Integration	Shared systems - "high" market
Products / peak avg. sales rates	80 PJ/yr(310TJ/d MDQ)

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
	1999										3			
	2000									31	98			
	2001									57	173			
Kipper RFSU 1/1/2002	2002			60.0								0.9	11.4	
	2003			60.0							16	0.9	11.4	
	2004			60.0							24	0.9	12.1	
Manta RFSU 1/1/2005	2005			80.0								0.9	13.1	
	2006			80.0							8	0.9	13.1	
	2007			80.0							31	0.9	13.4	
Onshore suction compression reqd	2008			80.0								0.9	14.7	
	2009			80.0								0.9	14.7	
Gummy RFSU 1/1/2010	2010			80.0								0.9	14.7	
	2011			70.1								0.9	14.7	
	2012			56.7								0.9	14.7	
	2013			47.7								0.9	14.7	
	2014			33.3								0.9	14.7	
	2015			28.8								0.9	14.7	
	2016			21.6								0.9	14.7	
	2017			17.0								0.9	14.7	
	2018			13.0								0.9	14.7	
	2019			11.3								0.8	14.0	
	2020			9.7								0.8	13.3	
	2021			8.5								0.8	12.6	
	2022			7.5								0.7	12.0	
	2023			6.7								0.7	11.4	
Abandonment	2024													15.2
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals			992						88	352	19	299	15

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Basker Manta Evaluation

Case 2e

Case definition

Gas sales, PJ	430
Oil/cond/LPG reserves, mmb	18.1
Scheme	M/G gas only
Integration	Tariff thro' Kipper - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 2.4 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Gummy appraisal well	1999					1		15						
	2000													
	2001													
	2002													
	2003													
	2004													
	2005													
1 appraisal each in Gummy and Manta	2006					2		24						
	2007													
PSA 1.1.2008	2008									58				
2 x G hor. appl well convs	2009						2hc		28	87				
Gummy RFSU 1/1/2010; 1 x M hor.well	2010	1 07	80.0	23.4			1h		18	3		10.2		
Manta RFSU 1/1/2011	2011	1.73	129 2	37 7								11.2		
1 x M hor.well (extended reach)	2012	2.14	159.5	46.4			1h		31	3		11.2		
1 x M hor.well	2013	2 37	177.3	51.7			1h		15	3		12.9		
	2014	2.50	195 8	60.0								13.8		
	2015	1.96	155.4	48.2								13.8		
	2016	1 55	125.2	39 3								13.8		
	2017	1.24	101 8	32.6								13.8		
	2018	1.01	84.4	27 5								13.8		
	2019	0.79	63.5	20 0								13.8		
	2020	0 64	50 2	15 3								13.8		
	2021	0.51	38 2	11 1								13.8		
	2022	0.43	32 1	9 4								13.1		
	2023	0.13	9.7	2.8								12.4		
	2024	0.10	7 2	2.1								11.8		
	2025	0.07	5.4	1 6								11.2		
	2026	0.05	4.0	1 2								10.6		
Abandonment	2027													19.9
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**18**	**1419**	**430**		**3**		**39**	**92**	**154**		**215**		**20**

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Basker Manta Evaluation
Case 2e P85

Case definition

Gas sales, PJ	290
Oil/cond/LPG reserves, mmb	12.2
Scheme	M/G gas only - P85
Integration	Tariff thro' Kipper - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)
	2.4 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Gummy appraisal well	1999					1		15						
	2000													
	2001													
	2002													
	2003													
1 appraisal each in Gummy and Manta	2004					2		24						
	2005													
PSA 1.1.2006	2006									58				
2 x M hor. appl wells (incl. 1 extended reach)	2007						2h		49	87				
Manta RFSU 1/1/2008; 2 x G hor.well convns	2008	0.23	17.1	27.7			2hc		28	6		11.2		
Gummy RFSU 1/1/2010: 1 x M hor.well	2009	1.28	95.3	41.0			1h		16	3		12.9		
	2010	1.88	140.7	48.8								13.8		
	2011	2.06	160.4	43.8								13.8		
	2012	1.76	140.4	38.7								13.8		
	2013	1.52	123.0	27.9								13.8		
	2014	1.03	85.9	23.2								13.8		
	2015	0.81	69.8	16.3								13.8		
	2016	0.62	50.9	10.2								13.1		
	2017	0.47	34.9	8.3								12.4		
	2018	0.38	28.6	2.0								11.8		
	2019	0.09	6.8	1.4								11.2		
	2020	0.07	4.9	1.0								10.7		
Abandonment	2021													19.9
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	12	959	290		3		39	92	154		166		20

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Basker Manta Evaluation

Case 2e P15

Case definition

Gas sales, PJ	734
Oil/cond/LPG reserves, mmb	31.8
Scheme	M/G gas only - P15
Integration	Tariff thro' Kipper - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)
	2.4 MMstb/yr

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
Gummy appraisal well	1999					1		15						
	2000													
	2001													
	2002													
	2003													
	2004													
	2005													
	2006					2		24						
	2007													
1 appraisal each in Gummy and Manta	2008													
	2009													
PSA 1.1.2010	2010									58				
2 x M hor. appl wells (incl. 1 extended reach)	2011						2h		48	86				
Manta RFSU 1/1/2012	2012	0.80	59.7	17.4								11.1		
2 x G hor.well convns; 1 x M hor.well	2013	1.37	102.0	29.8			2hc + 1h		43	9		11.1		
Gummy RFSU 1/1/2014	2014	1.77	132.1	38.5								13.6		
	2015	2.06	153.5	44.8								13.6		
	2016	2.76	206.3	60.0						13		13.6		
1 x G hor.well; 1 x M hor.well	2017	2.75	205.2	59.8			2h		35	19		14.2		
	2018	2.61	200.0	60.0								16.8		
	2019	2.48	194.3	59.5								16.8		
	2020	2.35	184.5	56.5								16.8		
	2021	2.04	161.2	49.9								16.8		
	2022	1.87	148.7	46.2								16.8		
	2023	1.63	130.7	41.0								16.8		
	2024	1.48	120.0	37.8								16.8		
	2025	1.31	102.5	31.3								16.8		
	2026	1.18	90.7	27.2								16.8		
	2027	0.71	53.9	16.1								16.8		
	2028	0.66	49.9	14.7								16.8		
	2029	0.62	46.9	13.8								16.8		
	2030	0.30	22.6	6.6								16.0		
	2031	0.28	21.1	6.2								15.2		
	2032	0.27	20.2	5.9								14.4		
	2033	0.25	18.9	5.5								13.7		
	2034	0.24	17.6	5.1								13.0		
Abandonment	2035													19.9
	Totals	**32**	**2442**	**734**		**3**		**39**	**126**	**186**		**352**		**20**

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Basker Manta Evaluation

Case 2e(i)

Case definition

Gas sales, PJ	430
Oil/cond/LPG reserves, mmb	18 1
Scheme	M/G gas only
Integration	Tariff thro' Kipper - "lo-low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ)
	1.8 MMstb/yr

Activity	Year	Sales Oil/cond Mstb/yr	Sales LPG kT/yr	Sales Gas PJ/yr	Well schedule Expln	Well schedule Appl	Well schedule Devt	Capital costs, A$mm 1998 Offshore Wells E & A	Capital costs Offshore Wells Devt	Capital costs Offshore Facs	Capital costs Onshore Facs	Operating costs, A$mm 1998 Offshore	Operating costs Onshore	Abandonment costs, A$mm 1998
Gummy appraisal well	1999					1		15						
	2000													
	2001													
	2002													
	2003													
	2004													
	2005													
	2006													
	2007													
	2008													
	2009													
1 appraisal each in Gummy and Manta	2010					2		24						
	2011									2				
PSA 1 1.20012	2012									38				
1 x M hor.well	2013						1h		18	60				
Manta RFSU 1/1/2014	2014	0.25	18.8	5.5								7.6		
	2015	0.87	65.0	19.0								7.6		
1 x M hor.well (extended reach)	2016	1.25	93.4	27.2			1h		31	22		7.6		
2 x G hor. appl well convns	2017	1.48	110.3	32.2			2hc		28	26		10.2		
Gummy RFSU 1/1/2018	2018	1.62	120.7	35.2								12.8		
1 x M hor.well	2019	1.84	137.1	40.0			1h		15	3		12.8		
	2020	1.74	133.4	40.0								13.7		
	2021	1.63	129.2	40.0								13.7		
	2022	1.54	123.9	39.0								13.7		
	2023	1.18	97.3	31.3								13.7		
	2024	1.03	86.1	27.9								13.7		
	2025	0.90	76.5	25.2								13.7		
	2026	0.76	61.5	19.4								13.7		
	2027	0.63	47.3	13.8								13.7		
	2028	0.56	41.8	12.2								13.0		
	2029	0.50	37.2	10.8								12.4		
	2030	0.26	19.6	5.7								11.8		
	2031	0.24	17.9	5.2								11.2		
	2032	0.31	22.9	6.7								10.6		
Abandonment	2033													19.9
	2034													
	2035													
	Totals	**19**	**1440**	**436**		**3**		**39**	**92**	**152**		**227**		**20**

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Basker Manta Evaluation
Case 2e(ii)

Case definition

Gas sales, PJ	430
Oil/cond/LPG reserves, mmb	18.1
Scheme	M/G gas only
Integration	Tariff thro' Kipper - "low" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ)
	1.4 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Gummy appraisal well	1999					1		15						
	2000													
1 appraisal each in Gummy and Manta	2001					2		24						
	2002													
PSA 1.1.2003	2003									38				
1 x M hor.well	2004						1h		18	62				
Manta RFSU 1/1/2005	2005	0.92	68.4	20.0								7.6		
	2006	0.92	68.6	20.0								7.6		
1 x M hor.well (extended reach)	2007	0.92	68.6	20.0			1h		31	3		7.6		
	2008	0.92	68.8	20.0								9.3		
	2009	0.92	68.6	20.0								9.3		
	2010	0.92	68.6	20.0								9.3		
	2011	0.92	68.6	20.0								9.3		
	2012	0.92	68.8	20.0						19		9.3		
2 x G hor. appl well convns	2013	0.92	68.6	20.0			2hc		28	26		10.2		
Gummy RFSU 1/1/2014; 1 x M hor.well	2014	1.17	87.4	25.5			1h		15	3		12.8		
	2015	1.41	114.2	36.2								13.7		
	2016	1.28	104.9	33.4								13.7		
	2017	1.18	97.3	31.3								13.7		
	2018	1.11	91.9	29.7								13.7		
	2019	0.77	66.4	22.2								13.7		
	2020	0.63	51.6	16.4								13.7		
	2021	0.52	41.3	12.8								13.7		
	2022	0.44	32.7	9.5								13.7		
	2023	0.39	28.9	8.4								13.0		
	2024	0.34	25.7	7.5								12.4		
	2025	0.31	23.1	6.7								11.8		
	2026	0.27	20.4	6.0								11.2		
	2027	0.24	17.7	5.2								10.6		19.9
Abandonment	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**18**	**1421**	**431**		**3**		**39**	**92**	**152**		**261**		**20**

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Basker Manta Evaluation
Case 2e(iii)

Case definition

Gas sales, PJ	430
Oil/cond/LPG reserves, mmb	18.1
Scheme	M/G gas only
Integration	Tariff thro' Kipper - "high" market
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ) 2.0 MMstb/yr

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
Gummy appraisal well	1999					1		15						
	2000													
1 appraisal each in Gummy and Manta	2001					2		24						
	2002													
PSA 1.1.2003	2003									38				
1 x M hor.well	2004						1h		18	62				
Manta RFSU 1/1/2005	2005	0.92	68.4	20.0								7.6		
1 x M hor.well (extended reach)	2006	0.92	68.6	20.0			1h		31	3		7.6		
	2007	0.92	68.6	20.0								9.3		
	2008	0.92	68.8	20.0						19		9.3		
2 x G hor. appl well convns	2009	0.92	68.6	20.0			2hc		28	26		10.2		
Gummy RFSU 1/1/2010; 1 x M hor.well	2010	1.99	148.7	43.4			1h		15	3		12.8		
	2011	1.94	153.9	47.8								13.7		
	2012	1.73	138.3	43.1								13.7		
	2013	1.55	125.2	39.4								13.7		
	2014	1.27	104.2	33.3								13.7		
	2015	1.07	89.0	28.8								13.7		
	2016	0.86	69.2	21.6								13.7		
	2017	0.72	55.8	17.0								13.7		
	2018	0.60	44.7	13.0								13.7		
	2019	0.52	38.8	11.3								13.0		
	2020	0.45	33.3	9.7								12.4		
	2021	0.39	29.3	8.5								11.8		
	2022	0.35	25.9	7.5								11.2		
	2023	0.31	22.9	6.7								10.6		
Abandonment	2024													19.9
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**18**	**1422**	**431**		**3**		**39**	**92**	**152**		**226**		**20**

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Basker Manta Evaluation

Case 2f

Case definition

Gas sales, PJ	495
Oil/cond/LPG reserves, mmb	19
Scheme	B/M/G gas only (after oil devt)
Integration	Tariff thro' Kipper - "base" market
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 2.5MMstb/yr cond

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
1 x Gummy appraisal well	1999					1		15						
(1 x Manta app/dev well drilled for oil - incrl to deeper target only)	2000					incremental		5						
	2001													
	2002													
	2003													
	2004													
	2005													
1 x Gummy appraisal well	2006					1		14						
	2007													
PSA 1.1.2008	2008									58				
2 x G hor. appl well convs	2009						2hc		26	86				
Gummy RFSU 1/1/2010; 1 x M hor.well (oil well S/T)	2010	1.07	80.0	23.4			1st		12	3		10.7		
Manta RFSU 1/1/2011	2011	1.73	129.2	37.7								11.5		
1 x M hor.well (extended reach)	2012	2.14	159.5	46.4			1h		31	3		11.5		
1 x M hor.well	2013	2.37	177.3	51.7			1h		15	20		13.2		
2 x Basker oil well recompletions	2014	2.50	195.8	60.0			2r		6	26		15.1		
Basker gas RFSU	2015	2.08	179.4	60.0								16.7		
	2016	1.70	154.5	53.6								16.7		
	2017	1.39	132.2	47.5								16.7		
	2018	1.15	112.9	41.5								16.7		
	2019	0.90	85.4	30.7								16.7		
	2020	0.64	50.2	15.3								16.7		
	2021	0.51	38.2	11.1								16.7		
	2022	0.43	32.1	9.4								15.9		
	2023	0.13	9.7	2.8								15.1		
	2024	0.10	7.2	2.1								14.4		
	2025	0.07	5.4	1.6								13.6		
	2026	0.05	4.0	1.2								13.0		
Abandonment	2027													27.1
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	19	1553	496		2		35	90	197		251		27

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Basker Manta Evaluation

Case 2g

Case definition

Gas sales, PJ	495
Oil/cond/LPG reserves, mmb	36.9
Scheme	B/M oil + B/M/G gas
Integration	Tariff thro' Kipper - "base market"
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ)
	9.0MMstb/yr oil + 2.5MMstb/yr cond

Activity	Year	Sales Oil/cond Mstb/yr	Sales LPG kT/yr	Sales Gas PJ/yr	Well schedule Expln	Well schedule Appl	Well schedule Devt	Capital costs, A$mm 1998 Offshore Wells E & A	Capital costs Offshore Wells Devt	Capital costs Offshore Facs	Capital costs Onshore Facs	Operating costs, A$mm 1998 Offshore	Operating costs Onshore	Abandonment costs, A$mm 1998
Basker appraisal well; PSA 1/10/99; 1 x Gummy appraisal well	1999					1+1		29		3				
2xB hor.well(1convn)+1xgas inj; 1xM app/dev well	2000						3 + 1c	5	54	28				
Oil RFSU 1/1/2001	2001	7.59								9		49.4		
Vert. S/T of 1 x Basker well; Manta RFSU	2002	4.22					1st		9			49.7		
	2003	3.42										50.1		
	2004	2.67										50.1		
Oil presumed uneconomic beyond end 2004	2005													
1 x Gummy appraisal well	2006					1		14						
	2007													
Gas PSA 1.1.2008	2008									58				
2 x G hor. appl well convs	2009						2hc		26	86				
Gummy RFSU 1/1/2010; 1 x M hor.well (oil well S/T)	2010	1.07	80.0	23.4			1st		12	3		10.7		
Manta RFSU 1/1/2011	2011	1.73	129.2	37.7								11.5		
1 x M hor.well (extended reach)	2012	2.14	159.5	46.4			1h		31	3		11.5		
1 x M hor.well	2013	2.37	177.3	51.7			1h		15	20		13.2		
2 x Basker oil well recompletions	2014	2.50	195.8	60.0			2r		6	26		15.1		
Basker gas RFSU	2015	2.08	179.4	60.0								16.7		
	2016	1.70	154.5	53.6								16.7		
	2017	1.39	132.2	47.5								16.7		
	2018	1.15	112.9	41.5								16.7		
	2019	0.90	85.4	30.7								16.7		
	2020	0.64	50.2	15.3								16.7		
	2021	0.51	38.2	11.1								16.7		
	2022	0.43	32.1	9.4								15.9		
	2023	0.13	9.7	2.8								15.1		
	2024	0.10	7.2	2.1								14.4		
	2025	0.07	5.4	1.6								13.6		
	2026	0.05	4.0	1.2								13.0		33.8
Abandonment	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	37	1553	496				48	153	236		450		34

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Basker Manta Evaluation

Case 2i

Case definition

Gas sales, PJ	23
Oil/cond/LPG reserves, mmb	24.8
Scheme	B/M oil - water inj
Integration	Tuna satellite
Products / peak avg. sales rates	50 mbd water inj 9.0MMstb/yr; 7PJ/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
								Offshore			Onshore			
								Wells		Facs	Facs			
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	E & A	Devt			Offshore	Onshore	
Basker appraisal well	1999					1		14						
PSA 1/7/2000	2000									50				
2xB hor.well(1convn)+1x w.inj well; 1xM app/hor. dev well	2001						3 + 1c		54	81				
RFSU 1/1/2002	2002	8.17		7.3						8		8.6		
Vert. S/T of 1 x Basker well; Manta RFSU	2003	5.90		5.2			1st		9			8.9		
	2004	3.71		3.4								9.3		
	2005	2.55		2.4								9.3		
	2006	1.54		1.3								8.8		
	2007	1.17		1.0								8.4		
	2008	0.83		0.8								7.9		
	2009	0.56		0.7								7.5		
	2010	0.37		0.6								7.2		
Presumed uneconomic beyond end 2010	2011													14.9
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	25		23		1		14	63	139		76		15

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Basker Manta Evaluation

Case 2i P85

Case definition

Gas sales, PJ	14.9
Oil/cond/LPG reserves, mmb	16.7
Scheme	B/M oil - water inj - P85
Integration	Tuna satellite
Products / peak avg. sales rates	50 mbd water inj 9.0MMstb/yr; 7PJ/yr

Activity	Year	Sales: Oil/cond Mstb/yr	Sales: LPG kT/yr	Sales: Gas PJ/yr	Well schedule: Expln	Well schedule: Appl	Well schedule: Devt	Capital costs, A$mm 1998: Offshore Wells E & A	Capital costs, A$mm 1998: Offshore Wells Devt	Capital costs, A$mm 1998: Offshore Facs	Capital costs, A$mm 1998: Onshore Facs	Operating costs, A$mm 1998: Offshore	Operating costs, A$mm 1998: Onshore	Abandonment costs, A$mm 1998
Basker appraisal well	1999					1		14						
PSA 1/7/2000	2000									50				
2xB hor.well(1convn)+1x w.inj well; 1xM app/hor. dev well	2001						3 + 1c		54	81				
RFSU 1/1/2002	2002	7.40		0.6						8		8.6		
Vert. S/T of 1 x Basker well; Manta RFSU	2003	3.54		3.1			1st		9			8.9		
	2004	2.68		2.5								8.8		
	2005	1.47		1.2								8.4		
	2006	0.79		0.6								7.9		
	2007	0.43		0.4								7.5		
	2008	0.38		0.4								7.2		14.9
Presumed uneconomic beyond end 2008	2009													
	2010													
	2011													
	2012													
	2013													
	2014													
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**17**		**15**		**1**		**14**	**63**	**139**		**57**		**15**

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Basker Manta Evaluation

Case 2i P15

Case definition	
Gas sales, PJ	32.8
Oil/cond/LPG reserves, mmb	35.6
Scheme	B/M oil - water inj - P15
Integration	Tuna satellite
Products / peak avg. sales rates	50 mbd water inj 9.0MMstb/yr; 9PJ/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
								Offshore			Onshore			
								Wells		Facs				
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	E & A	Devt		Facs	Offshore	Onshore	
Basker appraisal well	1999					1		14						
PSA 1/7/2000	2000									50				
2xB hor.well(1convn)+1x w.inj well; 1xM app/hor. dev well	2001						3 + 1c		54	81				
RFSU 1/1/2002	2002	8.63		7.7						8		8.3		
Manta RFSU	2003	7.28		6.5								8.6		
Vert. S/T of 2 x Basker wells to deeper LaTrobe	2004	6.03		5.3			2st		16			8.6		
	2005	3.58		3.3								9.3		
	2006	2.63		2.6								9.3		
	2007	1.85		1.5								9.3		
	2008	1.48		1.3								9.3		
	2009	1.23		1.1								8.8		
	2010	1.06		1.0								8.4		
	2011	0.81		0.9								8.0		
	2012	0.61		0.9								7.6		
	2013	0.43		0.7								7.2		14.9
Presumed uneconomic beyond end 2013	2014													
	2015													
	2016													
	2017													
	2018													
	2019													
	2020													
	2021													
	2022													
	2023													
	2024													
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**36**		**33**		**1**		**14**	**71**	**139**		**103**		**15**

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Basker Manta Evaluation

Case 3b

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	29.1
Scheme	K + M/G gas only - "base" market
Integration	Shared (no tariff) common systems
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 1.8 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Gummy appraisal well	1999							15		2	2			
Kipper PSA 1/1/2000	2000									59	96			
3 x Kipper vert wells;	2001								45	99	170			
Kipper RFSU 1/1/2002	2002	1.16	149.5	60.0						0		7.6	11.2	
1 x Kipper vert. well	2003	1.16	149.9	60.0					15	3		7.6	11.2	
	2004	1.16	150.3	60.0								8.7	11.2	
	2005	1.16	149.9	60.0								8.7	11.2	
1 appraisal each in Gummy and Manta	2006	1.16	149.9	60.0				24			5	8.7	11.2	
	2007	1.16	149.9	60.0							18	8.7	11.4	
2nd stage compn RFSU; M/G PSA 1/1/2008	2008	1.16	150.3	60.0						58		8.7	12.1	
2 x G hor. appl well convs	2009	1.16	149.9	60.0					28	87		8.3	12.1	
Gummy RFSU 1/1/2010; 1 x M hor.well	2010	1.78	171.5	60.0					18	3		18.1	12.1	
Manta RFSU 1/1/2011	2011	2.16	185.0	60.0								18.8	12.1	
1 x M hor.well (extended reach)	2012	2.40	193.6	60.0					31	3		18.4	12.1	
1 x M hor.well	2013	2.53	198.0	60.0					15	3		19.8	12.1	
Kipper abandonment	2014	2.50	195.8	60.0								14.6	12.1	14.6
	2015	1.96	155.4	48.2								14.6	12.1	
	2016	1.55	125.2	39.3								14.6	12.1	
	2017	1.24	101.8	32.6								14.6	12.1	
	2018	1.01	84.4	27.5								14.6	12.1	
	2019	0.79	63.5	20.0								14.6	12.1	
	2020	0.64	50.2	15.3								14.6	12.1	
	2021	0.51	38.2	11.1								14.6	12.1	
	2022	0.43	32.1	9.4								13.9	11.5	
	2023	0.13	9.7	2.8								13.2	11.0	
	2024	0.10	7.2	2.1								12.5	10.4	
	2025	0.07	5.4	1.6								11.9	9.9	
	2026	0.05	4.0	1.2								11.3	9.4	
M/G abandonment	2027													32.8
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	29	2821	991				39	152	317	291	322	289	47

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Basker Manta Evaluation

Case 3b(i)

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	29.1
Scheme	K + M/G gas only - "lo-low" market
Integration	Shared (no tariff) common systems
Products / peak avg. sales rates	40 PJ/yr(155TJ/d MDQ)
	1.8 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Gummy appraisal well	1999					1		15		2	2			
Kipper PSA 1/1/2000	2000									50	77			
3 x Kipper vert wells	2001						3		45	87	136			
Kipper RFSU 1/1/2002	2002	0.77	99.7	40.0						0		7.1	8.4	
	2003	0.77	99.9	40.0								7.1	8.4	
	2004	0.77	100.2	40.0								7.1	8.4	
	2005	0.77	99.9	40.0								7.1	8.4	
	2006	0.77	99.9	40.0								7.1	8.4	
	2007	0.77	99.9	40.0								7.1	8.4	
	2008	0.77	100.2	40.0								7.1	8.4	
	2009	0.77	99.9	40.0								7.1	8.4	
1 appl well each in G and M: 2nd stage onshore compressi	2010	0.77	99.9	40.0		2		24			3	7.1	8.4	
	2011	0.77	99.9	40.0						2	12	7.1	8.6	
M/G PSA 1.1 20012	2012	0.77	100.2	40.0						38		7.1	9.0	
1 x M hor.well	2013	0.77	99.9	40.0			1h		18	60		7.1	9.0	
Manta RFSU 1/1/2014	2014	0.92	105.0	40.0								14.4	9.0	
	2015	1.28	117.6	40.0								14.1	9.0	
1 x M hor.well (extended reach)	2016	1.50	125.6	40.0			1h		31	22		13.8	9.0	
2 x G hor. appl well convns	2017	1.63	129.9	40.0			2hc		28	26		16.2	9.0	
Gummy RFSU 1/1/2018	2018	1.71	132.7	40.0								18.5	9.0	
1 x M hor.well; abandonment Kipper	2019	1.84	137.1	40.0			1h		15	3		13.6	9.0	11.0
	2020	1.74	133.4	40.0								14.5	9.0	
	2021	1.63	129.2	40.0								14.5	9.0	
	2022	1.54	123.9	39.0								14.5	9.0	
	2023	1.18	97.3	31.3								14.5	9.0	
	2024	1.03	86.1	27.9								14.5	9.0	
	2025	0.90	76.5	25.2								14.5	9.0	
	2026	0.76	61.5	19.4								14.5	9.0	
	2027	0.63	47.3	13.8								14.4	8.6	
	2028	0.56	41.8	12.2								13.7	8.2	
	2029	0.50	37.2	10.8								13.0	7.7	
	2030	0.26	19.6	5.7								12.4	7.4	
	2031	0.24	17.9	5.2								11.8	7.0	
	2032	0.31	22.9	6.7								10.6		10.0
Abandonment M/G	2033													19.9
	2034													
	2035													
	Totals	29	2842	997		3	3	39	137	290	230	353	259	41

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Basker Manta Evaluation

Case 3b(ii)

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	29.1
Scheme	K + M/G gas only - "low" market
Integration	Shared (no tariff) common systems
Products / peak avg. sales rates	60 PJ/yr(230TJ/d MDQ) 1.8 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	Offshore Wells E & A	Offshore Wells Devt	Offshore Facs	Onshore Facs	Offshore	Onshore	
Gummy appraisal well	1999					1		15		2	3			
Kipper PSA 1/1/2000	2000									53	78			
3 x K vert wells; 1 appl each in G and M	2001					2	3	24	45	93	139			
Kipper RFSU 1/1/2002	2002	0.77	99.7	40.0						0		7.2	9.0	
M/G PSA 1.1.2003	2003	0.77	99.9	40.0						38	18	7.2	9.0	
1 x M hor.well	2004	0.77	100.2	40.0			1h		18	62	26	7.2	9.7	
Manta RFSU 1/1/2005	2005	1.69	168.3	60.0								14.8	10.8	
	2006	1.69	168.5	60.0								14.8	10.8	
1 x M hor.well (extended reach)	2007	1.69	168.5	60.0			1h		31	3		14.8	10.8	
	2008	1.70	169.0	60.0							7	16.5	10.8	
	2009	1.69	168.5	60.0							26	16.5	11.1	
2nd stage onshore compression RFSU	2010	1.69	168.5	60.0								16.5	12.1	
	2011	1.69	168.5	60.0								16.5	12.1	
	2012	1.70	169.0	60.0						19		16.5	12.1	
2 x G hor. appl well convns	2013	1.69	168.5	60.0			2hc		28	26		17.4	12.1	
Gummy RFSU 1/1/2014; 1 x M hor.well	2014	1.84	173.5	60.0			1h		15	3		19.7	12.1	
	2015	1.81	166.8	57.3								20.3	12.1	
	2016	1.53	137.0	46.2								20.0	12.1	
	2017	1.33	116.9	39.1								19.7	12.1	
	2018	1.20	103.9	34.5								19.5	12.1	
Abandonment Kipper	2019	0.77	66.4	22.2								14.6	12.1	11.0
	2020	0.63	51.6	16.4								14.6	12.1	
	2021	0.52	41.3	12.8								14.6	12.1	
	2022	0.44	32.7	9.5								14.6	12.1	
	2023	0.39	28.9	8.4								13.8	11.5	
	2024	0.34	25.7	7.5								13.1	11.0	
	2025	0.31	23.1	6.7								12.5	10.4	
	2026	0.27	20.4	6.0								11.9	9.9	
	2027	0.24	17.7	5.2								11.3	9.4	
Abandonment M/G	2028													32.7
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	**29**	**2823**	**992**		**3**	**3**	**39**	**137**	**299**	**297**	**386**	**292**	**44**

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Basker Manta Evaluation
Case 3b(iii)

Case definition

Gas sales, PJ	991
Oil/cond/LPG reserves, mmb	29.1
Scheme	K + M/G gas only - "high" market
Integration	Shared (no tariff) common systems
Products / peak avg. sales rates	80 PJ/yr(310TJ/d MDQ)
	2.7 MMstb/yr

Activity	Year	Sales			Well schedule			Capital costs, A$mm 1998				Operating costs, A$mm 1998		Abandonment costs, A$mm 1998
								Offshore			Onshore			
								Wells		Facs	Facs			
		Oil/cond Mstb/yr	LPG kT/yr	Gas PJ/yr	Expln	Appl	Devt	E & A	Devt			Offshore	Onshore	
Gummy appraisal well	1999					1		15		2	3			
Kipper PSA 1/1/2000	2000									60	98			
3 x K vert wells; 1 appl each in G and M	2001					2	3	24	45	101	173			
Kipper RFSU 1/1/2002	2002	1.16	149 5	60 0						0		7.7	11 4	
M/G PSA 1.1.2003; 1 x Kipper vert. well	2003	1.16	149.9	60 0			1		15	41	16	7.7	11.4	
1 x M hor.well	2004	1.16	150 3	60 0			1h		18	62	24	8.7	12.1	
Manta RFSU 1/1/2005	2005	2.07	218.3	80.0								16.3	13.1	
1 x M hor.well (extended reach)	2006	2.08	218.5	80.0			1h		31	3	8	16.3	13.1	
	2007	2.08	218 5	80 0							31	18.0	13.4	
2nd stage onshore compression RFSU	2008	2.08	219 1	80.0						19		18.0	14.7	
2 x G hor. appl well convns	2009	2.08	218 5	80.0			2hc		28	26		18 5	14.7	
Gummy RFSU 1/1/2010; 1 x M hor.well	2010	2.70	240.1	80.0			1h		15	3		20.8	14.7	
	2011	2.37	209.7	70 1								21.3	14.7	
	2012	1.99	172 4	56.7								21.0	14.7	
	2013	1.71	146.0	47.7								20.6	14.7	
Abandonment Kipper	2014	1.27	104 2	33 3								14.6	14.7	14.6
	2015	1.07	89.0	28 8								14.6	14.7	
	2016	0.86	69.2	21.6								14.6	14.7	
	2017	0.72	55.8	17 0								14.6	14.7	
	2018	0.60	44.7	13 0								14.6	14.7	
	2019	0.52	38.8	11.3								13.9	14.0	
	2020	0.45	33 3	9.7								13.2	13.3	
	2021	0.39	29.3	8 5								12.5	12.6	
	2022	0.35	25.9	7.5								11 9	12.0	
	2023	0.31	22.9	6 7								11.3	11.4	
Abandonment M/G	2024													35.1
	2025													
	2026													
	2027													
	2028													
	2029													
	2030													
	2031													
	2032													
	2033													
	2034													
	2035													
	Totals	29	2824	992		3	4	39	152	318	352	331	299	50

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