ANGOSTURA DEVELOPMENT
TRINIDAD AND TOBAGO

OVERVIEW

- BHP Billiton has committed to the development of the first phase of the Angostura integrated oil and gas development located in Block 2 (c) offshore Trinidad and Tobago.
- In the first phase of the development, oil will be produced from three wellhead protector platforms (WPPs) via flowlines to a steel jacket central production platform (CPP). Associated gas will be reinjected. Water depths are approximately 40 metres (130 feet) and the development utilises proven shallow-water technology.
- Gas commercialisation (Phase 2) will commence approximately three to nine years after first oil, depending on reservoir performance.
- The Angostura development is consistent with BHP Billiton Petroleum’s strategy of pursuing growth through oil exploration and production that can provide good returns.
- BHP Billiton is the first company to successfully pursue an oil and gas exploration program in this under-explored area.
- Entry was secured at modest cost in an area with attractive fiscal terms.
- There is further exploration potential in the area, and opportunities exist to build a material energy business with ready access to significant oil and gas markets.
- BHP Billiton is positioning the gas resource in the growing gas market to further unlock value.
- Capital expenditure for the first phase of the Angostura integrated development will be around US$726 million (gross), US$327 million net to BHP Billiton.
- The gross resource (mid-case volumes) is estimated at 450 million barrels of oil equivalent.
- First oil production is expected in 2004.
- BHP Billiton is the Operator of the Greater Angostura development. The joint venture participants are BHP Billiton Petroleum, 45%; TotalFinaElf, 30%; Talisman Energy, 25%.

KEY DATA

- P50 resource: approximately 450 million barrels of oil equivalent (160 million barrels of oil; 1.75 trillion cubic feet of natural gas).
- Field life: Angostura’s production life, for both oil and gas, is estimated at 19-24 years.
- Capex (Phase 1): US$726 million (US$327 million net to BHP Billiton).

CONTACTS

AUSTRALIA
Dr Malcolm Garratt
BHP Billiton Petroleum
Level 30
600 Bourke Street
Melbourne, Victoria 3000
Phone: (+61 3) 9652 6433
Email: malcolm.wj.garratt@bhpbilliton.com

TRINIDAD AND TOBAGO
Dr Carla Noel
BHP Billiton Petroleum
Stanmore House
6 Stanmore Avenue
Port-of-Spain
Phone: (+1 868) 625 0555
Email: carla.noel@bhpbilliton.com

UNITED STATES OF AMERICA
Mr Patrick Cassidy
BHP Billiton Petroleum (Americas) Inc.
1360 Post Oak Boulevard, Suite 150
Houston, Texas 77056-3020
Phone: (+1 713) 961 8500
Email: patrick.e.cassidy@bhpbilliton.com

March 2003
The Angostura Project is consistent with BHP Billiton’s strategy of pursuing growth through oil exploration and production that can provide good margins. Trinidad and Tobago’s location also allows access to the high-demand US crude oil markets, as well as Latin American and European markets.

The Angostura field development opens a new productive playway offshore Trinidad’s eastern coast. BHP Billiton is well positioned to grow reserves and production in this playway through its Operatorship of the Block 2(c) production area, Block 2(c) remaining exploration area, and the adjacent Block 3(a). Additionally, the location of the production and transportation facilities will be well positioned to serve any BHP Billiton or third-party discoveries in the area.

BACKGROUND: BLOCK 2(c)

BHP Billiton began exploring in Trinidad and Tobago in 1996, signing the country’s first Production Sharing Contract under a new fiscal regime. Since that time we have been the only company to successfully pursue a new oil play in the region.

In 1999, BHP Billiton made a natural gas discovery on Block 2(c) with the Angostura-1 well. In 2000, the Arp-1 well also encountered a thick interval of gas pay and a thin oil reservoir.

The Kairi-1 well discovered oil and gas in August 2001. In subsequent testing, Kairi-1 flowed at rates up to 3,300 barrels of oil per day (bbl/d) on a 38/64-inch choke, indicating the commercial oil potential of the accumulation. Following the oil discovery at Kairi, a project development team was assembled to initiate an appraisal drilling program and to begin assessing development options.

Drilling of Canteen-1 began in October 2001. Located on a separate fault block approximately 1.6 kilometers north of Kairi-1, Canteen-1 demonstrated a lateral extension of the oil accumulation, encountering approximately 213 meters (700 feet) of gross hydrocarbon-bearing sands that included 61 meters (200 feet) of net oil pay and 54.5 meters (179 feet) of net gas pay. The well tested at a rate of approximately 3,700 barrels of oil per day through a 72/64-inch choke. The Kairi-2 (ST2) appraisal well drilled in early 2002 encountered a 98 meters (322 feet) gas column, and more importantly, an oil column of 71.6 meters (235 feet).

Over the next six months, the Block 2(c) partnership drilled the Angostura-2 and Canteen-2 appraisal wells to further delineate the earlier discoveries.

THE GREATER ANGOSTURA FIELD

Block 2(c) is located approximately 38.5 kilometers (24 miles) east of the island of Trinidad. During the six year exploration phase of the PSC, four exploration and three appraisal wells were drilled, discovering significant oil and gas resources within a large faulted structure known as the Greater Angostura Structure.

Angostura-1, drilled in 1999, was the discovery well for the field, intersecting some 950 feet (gross) of gas pay within Early Oligocene sands. The hydrocarbon potential of the structure was confirmed by the drilling of Arp-1, Kairi-1, Canteen-1, Kairi-2, Angostura-2, and Canteen-2. Each of these exploration/appraisal wells intersected oil and gas in Oligocene sands. The Kairi and Canteen fault blocks contain most of the oil thus far. Arp-1 has a thin oil rim overlay by a significant gas cap.

RESERVES

The gross recoverable oil reserves are estimated between 90 and 300 million stock tank barrels (stb), with a mid-case of 150 million stb. The range of gross recoverable gas volumes is 1 to 3.2 trillion cubic feet (Tcf), with a mid-case volume of 1.75 Tcf. On an oil equivalence basis, the mid-case resource is estimated at approximately 450 million barrels of oil equivalent.

The Angostura development will be an integrated oil and gas development.

Oil will be produced from three unmanned steel jack wellhead protector platforms (WPPs) and sent via flowlines to a central steel jack production platform (CPP) located in water depths of approximately 40 meters. The produced fluids will be stabilised at the CPP to separate gas and any produced water. The oil will be transported via a 18 inch pipeline from the CPP to an onshore storage and marine loading facility located at Guayaguayare Bay for export to market.

Produced gas will be treated to recover liquids, then reinjected to maintain reservoir pressure and enhance oil recovery. Gas commercialisation will commence between three to nine years after first oil production, depending on reservoir performance.

The production facility will have a nameplate capacity of 100,000 barrels of oil per day. All production facilities are of conventional design.

First oil production is scheduled for December 2004.
Other participants are Talisman Energy, 30%; BG International, 30%; TotalFinaElf S.A, 10%. BHP Billiton has a 30% interest in Block 3(a) and is the Operator.

RESERVES

Angostura-1, drilled in 1999, was the discovery well for the field, intersecting some 950 feet (gross) of gas pay within Early Oligocene sands. The hydrocarbon potential of the structure was exploited in Kairi-2, Angostura-2, and Canteen-2. Each of these exploration/appraisal wells intersected oil and gas in Oligocene sands.

The contract governing the Angostura field project was signed on 22 April 2002. The joint venture will carry out a work program comprising 3-D seismic surveys and six wells in the first three-year phase of the PSC’s exploration period. The gross recoverable oil reserves are estimated between 90 and 300 million stock tank barrels (stb), with a mid-case or average estimate of 150 million stb. Oil and gas condensate is produced as a single stream of gas condensate. The mid-case reserve estimate is based on the volumetric method. The geology of the Angostura field is in the Eastern Venezuela Basin, together with its improved contract terms, make it one of the most attractive exploration areas for BHP Billiton to pursue in the Latin American and Caribbean region.

The gross recoverable reserves are estimated between 90 and 300 million stock tank barrels (stb), with a mid-case or average estimate of 150 million stb. The range of gross recoverable gas volumes is 1 to 3.3 trillion cubic feet (tcf), with a mid-case volume of 1.75 tcf. On an oil equivalence basis, the mid-case reserve is estimated at approximately 450 million barrels of oil equivalent.

RESERVES

The Kairi-1 well discovered oil and gas in January 2001 which was confirmed in the Aripo-1 well in 2002. The Aripo-1 well also encountered a thick interval of gas pay and a thin oil reservoir. The Aripo-1 well is located approximately 1.6 km north of Kairi-1. The Kairi-1 well demonstrated a lateral extension of the oil accumulation, encountering approximately 213 metres (700 feet) of gross hydrocarbon-bearing sands that included 61 metres (200 feet) of net oil pay and 54.5 metres (179 feet) of net gas pay. The well tested at a rate of approximately 3,700 barrels of oil per day through a 72/64-inch choke. The Kairi-2 (ST2) appraisal well drilled in early 2002 encountered a 98 metre (322 feet) gas column, and more importantly, an oil column of 71.6 metres (235 feet).

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The discovery well for the field was drilled in 1999, which was followed by the drilling of Aripo-1, Kairi-1, Canteen-1, Kairi-2, Angostura-2, and Canteen-2. Each of these exploration/appraisal wells intersected oil and gas in Oligocene sands. The Kairi and Canteen fault blocks contain most of the oil thus far. Aripo-1 has a thin oil rim overlain by a significant gas cap.

The production facility will have a nameplate capacity of 100,000 barrels of oil per day. All production facilities are of conventional design. First oil production is scheduled for December 2004.

FIRST OIL PROJECTION

First oil production is scheduled for December 2004. The gross recoverable oil reserves are estimated between 90 and 300 million stb, with a mid-case estimate of 150 million stb. The range of recoverable gas volumes is 1 to 3.3 trillion cubic feet (tcf), with a mid-case volume of 1.75 tcf. On an oil equivalence basis, the mid-case reserve is estimated at approximately 450 million barrels of oil equivalent.

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ANGOSTURA DEVELOPMENT TRINIDAD AND TOBAGO

The reserve estimates are based on the gross recoverable oil reserves are estimated between 90 and 300 million stb, with a mid-case or average estimate of 150 million stb. The range of gross recoverable gas volumes is 1 to 3.3 trillion cubic feet (tcf), with a mid-case volume of 1.75 tcf. On an oil equivalence basis, the mid-case reserve is estimated at approximately 450 million barrels of oil equivalent.
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CONTACTS

AUSTRALIA
Dr Malcolm Garratt
BHP Billiton Petroleum
Level 30
600 Bourke Street
Melbourne, Victoria 3000
Phone: (+61 3) 9652 6433
Email: malcolm.wj.garratt@bhpbilliton.com

TRINIDAD AND TOBAGO
Dr Carla Noel
BHP Billiton Petroleum
Stanmore House
6 Stanmore Avenue
Port-of-Spain
Phone: (+1 868) 625 0555
Email: carla.noel@bhpbilliton.com

UNITED STATES OF AMERICA
Mr Patrick Cassidy
BHP Billiton Petroleum (Americas) Inc.
1360 Post Oak Boulevard, Suite 150
Houston, Texas 77056-3020
Phone: (+1 713) 961 8500
Email: patrick.e.cassidy@bhpbilliton.com

March 2003