GasNet Australia - Supplementary Access Arrangement Information

Commencement Date: 1 January 2003

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General terms

1 Introduction

GasNet submitted its draft Access Arrangement and Access Arrangement Information (**"AAI"**), together with a supporting submission ("**Submission**") to the Commission for approval in March 2002. In its Final Decision, the Commission indicated that some of the information contained in GasNet's Submission should be included in its Access Arrangement Information. GasNet has agreed to provide this information in the form of a Supplementary Access Arrangement Information.

This Supplementary Access Arrangement Information adopts the conventions established by GasNet in its AAI, in particular, the glossary in section 1.7.

2 Service Envelope Agreement

GasNet's transmission network comprises approximately 1,930 km of pipelines. It serves a total consumption base of approximately 1.4 million residential consumers and approximately 43,000 industrial and commercial consumers throughout Victoria.

At the time the original access arrangements were submitted for approval to the Commission in 1997, GasNet's transmission assets consisted of two separate networks, the PTS and the WTS. However, as a result of the construction of the SWP, the WTS is now physically connected to the PTS.

2.1 Function

GasNet and VENCorp are parties to the Service Envelope Agreement. For the duration of the Second Access Arrangement Period the Service Envelope Agreement provides that:

(a) GasNet agrees to:

  (i) make available the entire GNS to VENCorp; and

  (ii) provide a range of supporting services to VENCorp; and

(b) VENCorp agrees to:

  (i) operate the GNS in accordance with the MSO Rules; and

  (ii) have the direct legal relationship with Users regarding a range of issues, including payment of charges for transmission services.

As a result of the Service Envelope Agreement, VENCorp will have operational control of the entire GNS and will be able to determine the manner in which Users are able to obtain services provided by means of the GNS.

2.2 Duration

The Service Envelope Agreement commenced on 15 March 1999 and is due to expire on 11 December 2007. However, GasNet and VENCorp have agreed to extend the operation of the Service Envelope Agreement to 31 December 2007 to coincide with the proposed end of the Second Access Arrangement Period.

2.3 Application to WTS

Currently, the Service Envelope Agreement only applies to the PTS. However, GasNet and VENCorp have reached in principle agreement that, with effect from 1 January 2003, the Service Envelope Agreement will also apply to the WTS, subject to the following conditions being satisfied.

(a) The Commission approving the merging of the WTS and PTS to form the GNS.

(b) The termination of the WTS Agreement.

GasNet has assumed that the merger of the PTS and WTS will be approved and that the Service Envelope Agreement will apply to the whole of the GNS.

3 Market Carriage

Access to the GNS for Users is governed by the MSO Rules, which establish a Market Carriage regime for the transportation of gas. In order to obtain Access to the GNS, a User must register with VENCorp as a Market Participant under the MSO Rules.

A fuller description of the market carriage system, together with a justification of the market carriage arrangements, are set out in the VENCorp Access Arrangement documents.

4 Historical Capital Expenditure 1998-2002

In the Final Decision relating to the First Access Agreement Period, the Commission approved reference tariffs which incorporated forecast capital expenditure of $60.7 million. GasNet completed some of these projects, while it has not completed others, choosing instead to achieve its service obligations by implementing alternative capital projects. In addition, GasNet completed a number of other projects that were not contained in the forecast capital expenditure which were believed to be more optimal capital projects.

Table 3-1 below shows the differences between forecast and actual capital expenditure by project.

Table 4-1: Actual Capital Expenditure 1998-2002 ($ million)

Project Description	Forecast	Actual
Gooding Compressor automation	1.50	2.21
Brooklyn Compressor automation	2.69	4.13
Brooklyn compressor restaging and gas cooler upgrade	1.07	1.85
Brooklyn Loop	27.15	-
SWP	-	82.80
Interconnect Assets	-	42.60
Bulla Park Compressor (a)	-	28.10
Young Compressor (a)	-	19.56
Murray Valley Pipeline (b)	15.63	15.63
General Maintenance Capital Expenditure	7.61	1.92
Non-System Capital Expenditure	1.07	1.09
Total	56.72	199.89

(i) These assets are owned by GasNet and support the GNS. However, as they are situated in NSW on a different gas transmission pipeline system, they do not form part of the Capital Base of the GNS.

(ii) This amount was incorrectly classified as forecast capital expenditure, even though the Murray Valley pipeline had in fact been completed.

5 Forecast Capital Expenditure

5.1 Supplementary information

Information in relation to GasNet's forecast capital expenditure is contained in section 3-6 of GasNet's Access Arrangement Information. The information contained in this Supplementary Access Arrangement Information gives a more detailed justification for some of the capital expenditure projects.

5.2 Gooding compressor station refurbishment

The Gooding compressor station refurbishment is expected to be commissioned over the period 2005-2007 at a cost of $20.4 million (2002 dollars).

The compressor station, which was constructed in 1976, is nearing the end of its 30 year economic life. This life is consistent with the technical life for compressor stations adopted by most other transmission pipeline companies.[1] The current compressors are showing signs of wear and erosion consistent with being in service for nearly 30 years. The station has an operating duty which has subjected the rotating equipment to unusually high levels of thermal cycling associated with a high frequency of stops and starts. In addition, the compressor staging no longer matches the ideal operating point which has moved with changes in sources of supply.[2] GasNet proposes to replace the turbines and compressors with packages optimally staged for

[1] See for example, ACCC, *MAPS Gas Access* Arrangement (Final, 2001), p 20.

[2] See Annual Planning Review, VENCorp Energy Networks Corporation, November 2001, p 20.

future operating needs and incorporating the low emission and dry seal technologies currently available.

The refurbishment of the compressor station is also required:

(a) to replace the ancillary equipment including exhaust systems, air intake housings, back up generator and gas and water jacket heaters which have substantially deteriorated with age;

(b) to add station cooling to sustain longer operating periods through fewer stops and starts; and

(c) to upgrade the PLC control system to ensure compliance with the recently released IEC 61508 standard governing the design of safety systems.

For the reasons identified above, GasNet submits that the capital expenditure is reasonably likely to meet the requirements of section 8.16 of the Code. Cost estimates are based on past experience of similar projects and information from original equipment manufacturers. Cost estimates also take into account the requirement under clause 19(l) of the Environment Policy (Air Quality Management) No. 5240 which requires a generator of a new or substantially modified source of emissions to apply best practice in the management of those emissions.

5.3 Lurgi pipeline rehabilitation

The Lurgi pipeline rehabilitation is expected to take place over the period 2004 - 2007. The capital works will be staged and the results of each stage will determine the nature of the expenditure for the next stage and hence final project costs will be dependent on the results of pigging and subsequent dig up investigations.

The Lurgi pipeline was built in 1958 and is the oldest gas transmission pipeline in Australia. The Lurgi line was built in accordance with the available technologies and standards of the day. Pipe manufacturing, coating systems, construction techniques and corrosion mitigation science have since advanced significantly.

GasNet has been unable to undertake any internal inspections of the pipeline to identify evidence of corrosion as the line valves are not designed to enable the passage of a pig. In order to internally inspect this pipeline, it will be necessary to conduct significant works to enable geometric and corrosion pigs to travel the length of the pipeline. Such works include replacing line valves.

The current maximum operating pressure for the Lurgi pipeline is 2760 kPa. Depending on the survey results there is a real possibility that the pipeline, or segments of the pipeline may need to be de-rated to operate at pressures below 1050 kpa. To continue to provide equivalent capacity and service requirements from a de-rated pipeline, significant works will need to be carried out. This work could involve:

(a) building cross connections between the 6890 kPa Longford - Dandenong pipeline and the de-rated 1050 kPa Lurgi pipeline.;

(b) carrying out alterations within the Dandenong terminal station for the supply of gas into the 2760 kPa and 700 kPa systems, currently supplied from the Lurgi pipeline;

(c) building new city gates at Morwell and at the end of each cross connection;

(d) the partial looping of the Longford to Dandenong pipeline; and

(e) substantial replacement or repair of sections of the pipe and/or coating.

The capital works will be staged to ensure that only necessary works will be conducted. Each of the stages for rehabilitating the pipeline are set out below.

(a) Stage 1 - Pipeline is prepared for pigging including the removal/replacement of selected line values. Pigging is conducted in 2005. Results of pigging analysed and verified with a dig up program.

(b) Stage 2 - Rehabilitate the pipeline according to the results of the pigging analysis.

The cost estimate for Stage 1 (2002-2003 and 2004-2005) is $5.44 million (2002 dollars). The costs for Stage 2 (2005-2006 and 2006-2007) will be dependent on the results of Stage 1 works.

Only the cost estimate for Stage 1 will be included in the calculation of tariffs for the Second Access Arrangement Period at this time. In the event that GasNet is required to conduct Stage 2 works, it will seek to have the costs associated with those works rolled into the Capital Base under section 8.16 of the Code.

5.4 City gate upgrades

Upgrades at the Dandenong, Wollert and Morwell city gates and the Tyers pressure limiter will be conducted over the period 2004-2006. The forecast cost of the upgrades is $5.60 million (2002 dollars).

These upgrades are necessary for the following reasons.

(a) Most of the regulators and associated controls are over 30 years old and experience frequent hydraulic oil leaks. They are becoming less reliable and more expensive to keep in service.

(b) There are no liquid separation facilities (except at compressor station inlets) throughout the transmission system to separate liquids injected into the transmission system by producers. The liquids are injected in low levels and dropped out of the stream flow and quantities build up over time. GasNet currently conducts periodic line valve syphoning to remove excess liquids from the pipeline low points. With greater diversity of markets and supply sources and the tendency for plants to operate at peak capabilities, higher levels of liquid carryover can be anticipated in the future. Liquid carry over is very difficult to detect

using the current technology and gas quality monitoring equipment. Therefore, GasNet proposes to install liquid removal facilities at each of the these stations.

(c) The design and operational requirements of the Wollert city gate have changed a number of times since it was first constructed. Major re-engineering works are required to rationalise and upgrade the equipment and controls for this city gate.

For the reasons identified above, GasNet submits that the capital expenditure is reasonably likely to meet the requirements of section 8.16 of the Code. Cost estimates are based on past experience with similar projects.

5.5 Wollert compressor station automation

The Wollert compressor station requires an upgrade to the control system to allow reliable remote operation of the system by VENCorp. This follows the automation of Gooding and Brooklyn compressor stations in 1999 and 2000. It is anticipated that the automation will be carried out during the summer of 2004/2005. The forecast cost for the automation is $2.7 million (2002 dollars).

In addition to allowing the reliable remote operation of the system by VENCorp, the automation of the compressor is required for the following reasons.

(a) Due to the poor reliability of the control system, the station currently requires manning for start up, which is not viable in the long term.

(b) Spare parts and product services are becoming more difficult to source leading to unacceptable repair delays.

(c) Market dynamics drive the compression scheduling through a market clearing engine, requiring prompt and reliable unit starting, stopping and variable speed controls.

(d) The uplift penalties associated with system constraint caused by equipment failure means that a greater level of equipment reliability is required.

For the reasons identified above, GasNet submits that the capital expenditure is required to maintain the safety and integrity of the system.

Cost estimates are based on past experience with automations at the Brooklyn and Gooding compressor stations.

5.6 Gas heaters at Dandenong, Wollert and Tyers

GasNet proposes to install gas heaters at Dandenong in 2004, Wollert in 2006 and Tyers in 2004. The forecast cost of the projects is $3.0 million (2002 dollars).

The *Gas Safety (Gas Quality) Regulations* 1999 (Vic) and VENCorp "Gas Quality Guidelines" were amended in August 2000 to allow for a broader range of gas qualities. This was intended in part, to allow for more supply

diversity from new field developments and interstate capacity. A consequence of this change is that there are now higher probabilities that liquid condensates will form with the lower gas temperatures due to the pressure reductions at the pressure regulator stations.

In order to mitigate the risk of condensate drop out and to maintain system capabilities, it will be necessary to install gas heaters at the Dandenong, Wollert and Tyers regulator stations.

There is an increasing trend for producers to inject gas with increased quantities of higher hydrocarbons. The tendency for liquid condensate to form at the current downstream gas temperatures is expected to increase as more producers supply into the system and the current producers supply into more markets. The current winter trend of using rich gas compositions to meet winter supply peaks is likely to increase in the future.

The cost of installing the heating system is based on benchmark costing derived from recent similar projects at Brooklyn and Lara.

For the reasons identified above, GasNet submits that the capital expenditure is reasonably likely to meet the requirements of section 8.16 of the Code.

5.7 Maintenance capex

GasNet has included an allowance in each regulatory year for maintenance capital expenditure. Total forecast maintenance capital expenditure is $5.66 (2002 dollars) million. This includes IT upgrades (both hardware and software), upgrading of assets such as cathodic protection units, station instruments, electronic systems and heat exchangers and the acquisition of field and workshop equipment.

6 Compressor Fuel Costs

Table 5-1 below sets out GasNet's historical and forecast compressor fuel costs.

Table 6-1: Historical and forecast compressor fuel costs ($ million)

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1.0	0.7	0.6	0.9	1.1	1.2	1.3	1.4	1.6	1.7

7 Forecast Volumes

The forecast annual volumes for the Second Access Arrangement Period and the forecast peak day volumes are set out in Table **7-1** and Table **7**-2 below. The basis for the forecast is the annual volume forecast provided in the VENCorp Annual Planning Review. GasNet has modified the published VENCorp forecast to take into account a warming trend, and has added an estimate for storage refill volumes (which are not included in the price control model. The peak day volumes exclude gas for use in GasNet compressor stations.

Table 7-1: Forecast Annual Withdrawal Volume 2003-2007

Annual Volumes (PJ/year)	2003	2004	2005	2006	2007
Conventional Market	204.0	211.0	217.7	221.3	223.7
Gas-Fired Power Station	12.2	14.3	15.0	15.9	17.6
Storage refill	3.6	3.6	4.3	3.2	3.4
Total	219.8	228.9	237.0	240.4	244.7

Table 7-2: Forecast Peak Day Volumes 2003-2007

Co-incident peak day (1:2) (TJ/day)	2003	2004	2005	2006	2007
Conventional Market	1075	1107	1139	1161	1175
Gas-Fired Power Station	57	67	70	74	82
Total	1132	1174	1209	1235	1257

8 Supply Forecasts

While the availability of gas over the whole year is basic to the operation of the transmission system, only the winter peak flows set GasNet's injection revenue. This section relates only to those peak injections.

Table 7-3 below sets out the average daily injection volumes at each tariffed Injection Zone for the 10 Peak Injection Days. These injections are not coincident and non-tariffed injections are not included.

Table 7-3: Forecast Average of 10 Peak Days Injection

TJ/Day	2003	2004	2005	2006	2007
Longford	826	841	841	841	841
Culcairn	17	17	17	17	17
Port Campbell	176	170	172	194	208
Yolla	0	60	60	60	60

8.1 Longford Injection Zone

A large quantity of gas is contracted to the three incumbent Retailers from the ESSO/BHPP fields for the forecast period. However, there is a limit to the Maximum Daily Quantity (MDQ) which is available on any day. VENCorp has published its understanding of the level of this MDQ to 2005, and GasNet has maintained this level for the remainder of the forecast period. Based on the VENCorp APR, the MDQ is 830 TJ/day, falling to 810 TJ/day.

Gas will also be available from the Baleen/Patricia/Kipper fields. These fields are being developed in sequence, and a gas processing plant is being constructed at Orbost, for connection to the EGP. Gas will be back-hauled to Longford where it will enter the GasNet pipeline at Longford via a connection facility called VicHub, being constructed by Duke. GasNet has assumed a daily quantity of 35 TJ/day from this source.

There is a possibility that more gas can be supplied from these fields. However, GasNet has made an assessment that this is unlikely. This is because:

(a) there are ample supplies from other planned sources that can supply the forecast demand without additional supplies from Longford (that is, if Longford supplied additional gas on the peak period, then another supply source would have to be curtailed below our reasonable assessment of their production levels);

(b) the Bass Strait producers have access to new markets in NSW (via the EGP) and Tasmania (via the proposed Duke pipeline); and

(c) it is more economical for the Bass Strait producers to utilise existing peak supply capacity for high load factor loads in New South Wales or Tasmania, rather than increase their low load factor production into Victoria (current Longford load factor is 60% compared to desirable levels of 90%+).

8.2 Culcairn

Based on the VENCorp Annual Planning Review, it is understood that 28 TJ/day is currently contracted for injection at Culcairn. This corresponds to approximately 10 PJ/year at a 95% load factor. The capacity of the Culcairn delivery system is 50 TJ/day (92 TJ/day if the GasNet Bulla Park and Young compressors are maintained at their current locations on the EAPL pipeline).

The current 28 TJ/day of imports at Culcairn includes a contract for 14 TJ/day which GasNet understands ends in 2003. GasNet anticipates that the injection volumes will decline to approximately 17 TJ/day.

8.3 Yolla

Origin Energy has approved a proposal to develop the Yolla fields in the Bass basin approximately midway between Victoria and Tasmania. This proposal envisages a pipeline connection to the GasNet main transmission pipeline at Pakenham, approximately 29 km from Dandenong.

This project is scheduled to begin production in mid 2004 with full production levels reached by the end of the 3rd quarter. GasNet has assumed a capacity of close to 70TJ/day.

8.4 Port Campbell

Currently gas is injected into the SWP from the WUGS facility at Iona. However, as new fields are developed in the area, it is possible that new injection points in the vicinity of Iona will be developed to inject into the SWP. A reference to the Port Campbell Injection Zone is intended to refer to the aggregate of these adjacent injection points.

Port Campbell accesses four sources of gas.

(a) The local on-shore fields around Port Campbell, which are currently producing around 25 TJ/day, and which are the subject of an on-going exploration and development program by Santos.

(b) The newly discovered off-shore gas resource of Thylacine and Geographe. The off-shore Otway basin resource, of which these fields are a part, is estimated to contain between 1000 PJ and 4000 PJ of gas. On current plans they will be producing by 2006. The developers are Origin Energy and Woodside.

(c) The Minerva and La Bella fields, owned by BHPP. The Minerva field is estimated to contain 300 PJ of gas. This resource has been contracted to South Australia from 2004, but it is expected that some production will be available for injection into the GasNet system, (although this is currently speculative).

(d) The WUGS facility. The WUGS storage and gas processing facility has a capacity of 10 PJ, and can inject at least 220 TJ/day into the GasNet system at a pressure of 10 MPa.

The Santos and Origin/Woodside resources are likely to be developed to produce at a high load factor in order to maximise the economic benefit of the developments. GasNet is forecasting that Santos will gradually increase production to approximately 55 TJ/day, before declining as production commences from Thylacine and Geographe. GasNet has forecast that Thylacine and Geographe will be producing 60 TJ/day in 2006 (20 PJ/year) and 90 TJ/day in 2007 (30 PJ/year) for supply into Victoria. The actual field production levels will be considerably higher, with the bulk going to South Australia via the proposed Port Campbell-Adelaide pipeline.

GasNet considers that these are relatively modest production scenarios. These volumes provide a minimal level of competition against Bass Strait gas, and are likely to be produced for this reason alone.

Based on the above-mentioned supply assumptions, there is a residual unsupplied peak day demand which is available from the WUGS and LNG facilities. GasNet expects that these storages will take the balance of the load. Given the peaky nature of the demand profile, the balance of unsupplied load requires an annual volume in the range of 3-5 PJ/year, but peak send-outs of 220-320 TJ/day. The storage facilities are purpose built to supply such peaky loads and it is extremely unlikely that base load field capacity will be developed to supply such high peak loads with such a low annual volume requirement.

Although there is adequate supply capacity available at Port Campbell, the flows from Port Campbell to Melbourne are limited by the capacity of the SWP.

8.5 Dandenong

Dandenong is the site of the LNG storage facility. The facility currently holds 450 TJ of gas as LNG under contract for use by retailers. The plant has the ability to inject (by vaporization) up to 150 TJ/day into the GasNet system.

The economics of use of LNG are determined by the very slow refill rate. Once LNG has been injected into the transmission system, the retailer cannot rely on it being replaced in the short term. Therefore, it is prudent for the

holders of LNG stock to keep back some reserves to supply unexpected fluctuations in gas demand. For example, the occurrence of a 1:20 severe winter will add approximately 80 TJ to the peak day. GasNet has assumed that at least this amount will be held back for severe conditions, leaving 60-70 TJ/day for use in peak shaving. This amount is backed off the WUGS injections.

9 Tariff Path

GasNet employs a 'price path' tariff methodology. This means that GasNet will specify:

(a) a set of initial tariff components applicable to the year 2003, and

(b) a procedure to adjust tariffs components, applicable to each subsequent year.

Once these elements have been determined, the initial tariff components and the tariff adjustment procedure are not altered over the term of the Second Access Arrangement Period, except as provided for in clauses 4.4, 4.5 and 4.9 of GasNet's Access Arrangement.

The fixing of the price path constitutes an incentive mechanism. The tariff adjustment procedure is not altered if actual volumes or actual costs differ from the initial forecast. This methodology exposes GasNet to both volume and cost risk, and removes these risks from GasNet customers.

The extent to which GasNet is exposed to volume risk is determined by the mechanics of the tariff adjustment procedure. GasNet has chosen a price path based on a form of average revenue price control. This means that the tariff components will be set each year to achieve a prescribed average revenue. Therefore, the GasNet revenues are tied to the actual delivered volumes through the GasNet system, which may vary from the initial forecast values.

The average revenue price path is calculated in advance (in real terms) based on the forecast volumes and target revenues. These target average revenues are published in the tariff schedule for each year subsequent to 2003. The price path is locked-in except for annual adjustments for actual inflation, pass through events and to correct any under- or over-recovery of revenues in the preceding year. This annual adjustment for the under or over-recovery of revenues in the previous year plus any approved Pass Through Amounts is called the K-Factor. If GasNet under/over recovers revenues in a given year in relation to the prescribed average revenue for that year, then GasNet is permitted to increase/(decrease) tariff components in the subsequent year to correct for the under/over recovery subject to a 2% rebalancing constraint.

Any over/under recoveries in the Second Access Arrangement Period which cannot be recovered due to the rebalancing constraint will be carried forward into the subsequent Access Arrangement Period.