GPU GasNet Pty Ltd
Application for Revision to Access Arrangement

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Annexure 1

1 Interconnect Pipeline

The Interconnect pipeline commences from a branch valve on the Wollert to Wodonga pipeline at the Barnawartha-Howlong Rd and travels in a northerly direction to the EAPL Culcairn Meter Station in NSW. The pipeline crosses the Murray River approximately 5 km. north of Barnawartha. The pipeline route is shown on the attached map.

The length of GPU - owned pipeline is 62.5 km. The pipeline has a diameter of 450 mm, is internally unlined and has been built to an MAOP of 10,200 kPa. It is fitted with automatic linebreak controls, remote control and monitoring of line valves, and scraper stations at Barnawartha and Culcairn.

The pipeline is covered by two licences:

- Victorian Pipeline Licence 178 - Diameter 450mm Barnawartha North to VIC/NSW Border *(Barnawartha to VIC/NSW Border)*; and
- NSW Pipeline Licence 24 - Diameter 450mm VIC/Border to Culcairn *(VIC/NSW Border to Culcairn)*.

2 Springhurst Compressor Station and Valves

The locations of the Springhurst Compressor and the associated Valves are shown on the attached map.

2.1 Springhurst Compressor Station

The Springhurst Compressor Station is situated on the 300mm diameter Wodonga to Wollert pipeline (MAOP 7400 kPag). It is located 20.9 km. south of Barnawartha (the point where the Interconnect joins the Wodonga to Wollert pipeline). Its purpose is to lift line pressure in the pipeline to assist the southward flow of gas towards Melbourne.

The Springhurst Compressor Station consists of one (1) Centaur 50 T-6100 gas turbine engine manufactured by Solar Turbines of the U.S.A., driving a 4 stage C3341 centrifugal compressor, also manufactured by Solar Turbines. The engine is rated at a nominal power of 4550 kW.

The single machine is housed in a sound attenuated enclosure. A separate process control room (PCR) houses the unit and station control systems, switch room and battery systems. There is no stand-by power generator.

The compressor station facilities include inlet station pipe work connecting to a suction filter separator with associated header pipe work, and outlet station pipe work with fin fan gas after-coolers connecting to the Wollert/Wodonga pipeline. As the Springhurst Compressor Station is fitted with a gas discharge after-cooling system, recycling of gas through the compressors is permissible for periods up to half an hour.

Other features of the facility include:

- station inlet and outlet pipe work blowdown manifolds and vent stack;
- station and unit controls;
- SCADA facilities to the VENCorp control room; and
- auxiliary systems including a fuel gas meter, dual run fuel gas regulators and oily liquids separators.

The station is fitted with remote compressor unit start and stop functionality and initiation of a station emergency shutdown, via the VENCorp control room.

2.2 Barnawartha City Gate

The Barnawartha City Gate is located at the junction of the Interconnect Pipeline and the Wodonga to Wollert pipeline. The facility consists of three parallel runs:

- one 300mm bi-directional un-regulated by-pass run which permits gas to flow in either direction between the two pipelines; and
- two 100mm uni-direction pressure regulator runs (one duty and one stand-by) which provide pressure reduction from the Interconnect 10200 kPa MAOP pipeline to the Wollert-to-Wodonga 7400 kPa MAOP pipeline.

The facility includes station pipe work, two line valve assemblies, an existing pig launching and receiving assembly, a station vent connecting to the Interconnect pipeline and station pipe work connecting to the Wollert to Wodonga pipeline. The facility has an RTU which allows remote set-point control of the active regulators and remote operation of a slam-shut valve in all three runs. The RTU also performs other local control, flow calculation and monitoring functions. A vortex flow meter is fitted in each regulator run to provide indicative flow measurement and the ability to implement flow control.

The facility can be operated in one of the following two operation modes:

- Bi-directional flow of gas between the Wollert to Wodonga pipeline; and
- Pressure reduction of gas flowing from the Interconnect pipeline into the Wollert to Wodonga pipeline.

2.3 Wandong Pressure Limiter

The Wandong Pressure Limiter is located at the junction of the Wodonga - Wollert pipeline and the Wandong - Kyneton pipeline. The facility provides for pressure reduction of gas flowing from the Wollert - Wodonga into the Wandong - Kyneton pipeline. It consists of three parallel runs:

- One 250mm bi-directional un-regulated by-pass run which permits gas to flow in either direction between the Wollert to Wodonga pipeline and the Wandong to Kyneton pipeline; and

- Two 150mm diameter uni-direction pressure regulator runs (one duty and one stand-by) which provide pressure reduction from the Wollert to Wodonga pipeline into the Wandong to Kyneton pipeline.

The pressure limiter facility includes inlet pipe work that connects directly into the Wollert to Wodonga pipeline and outlet pipe work that connects into the Wandong to Kyneton pipeline, and an existing pig launching and receiving station. A vortex flow meter is fitted in each regulator run to provide indicative flow measurement and the ability to implement flow control.

The facility has a RTU, which allows remote set-point control of the single-cut regulators and remote operation of the run isolation valves. The RTU also performs other local control, flow calculation and monitoring functions.

2.4 Ballan Actuated Valve Station

The actuated valve facility is installed in parallel with an existing line valve 12.8 km. north of the Ballan bifurcation on the Ballan to Bendigo pipeline.

The facility consists of two parallel runs – one buried 150mm diameter remote actuated ball valve (UV-04) and one above ground 80mm diameter remote actuated ball valve (UV-08).

The facility has an RTU, which allows remote operation of both ball valves UV-04 and UV-08 and provides other monitoring functions.

2.5 Wollert Pressure Limiter and Modified Wollert City Gate

The Wollert pressure limiter facility is installed within the same enclosure of the Wollert city gate. The pressure limiter facility consists of three parallel runs:

- One 300mm bi-directional un-regulated by-pass run which permits gas to flow in either direction between the Pakenham to Wollert pipeline and the Wollert to Wodonga pipeline; and
- Two 200 mm uni-direction pressure/flow regulator runs (one duty and one stand-by) which provide pressure reduction of gas flowing from the Pakenham to Wollert pipeline into the Wollert to Wodonga pipeline.

The facility has an RTU, which allows remote set-point control of the single cut regulators and remote operation of both the slam-shut and run isolation valves. The RTU also performs other local control, flow calculation and monitoring functions. A vortex flow meter is fitted in each regulator run to provide indicative flow measurement and the ability to implement flow control.

The facility also includes inlet and outlet pipe work connecting to the Wollert city gate and the Wollert compressor station.

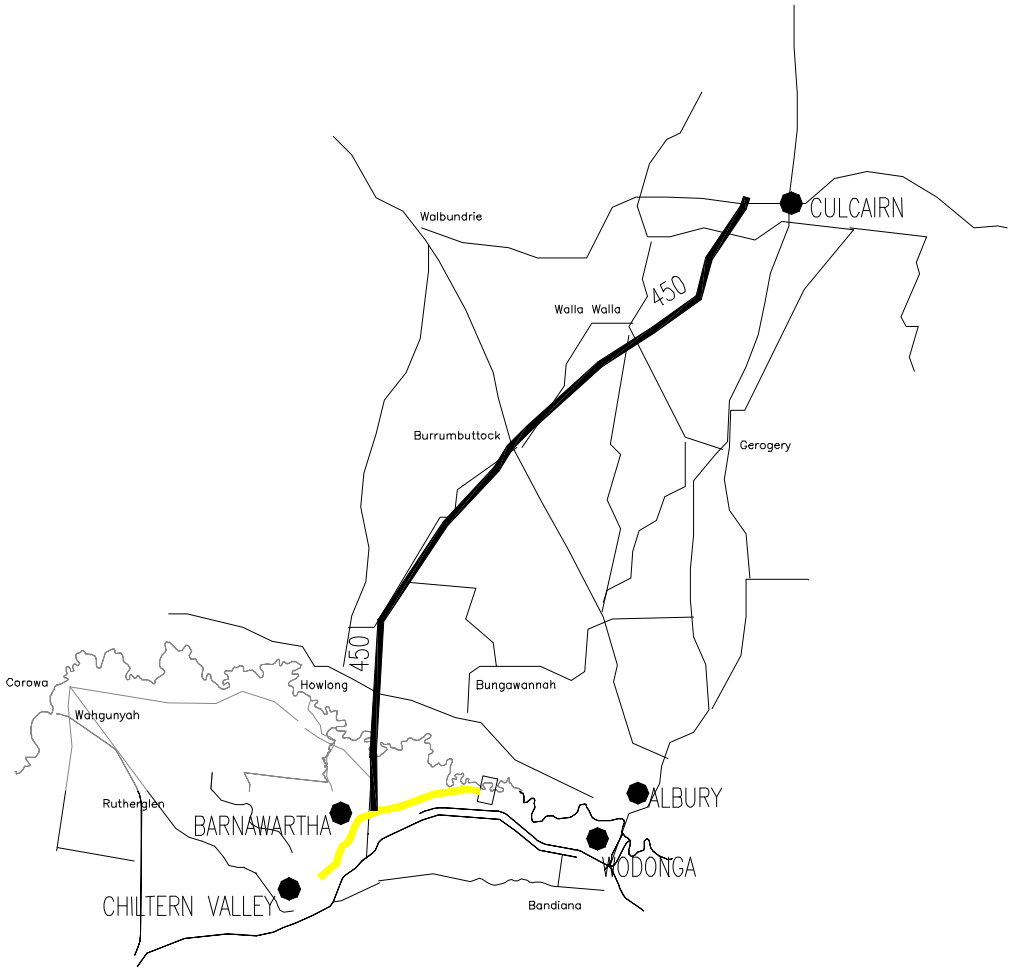
The Wollert City Gate has been modified to operate in conjunction with the pressure limiter. The regulator station provides pressure reduction for gas being supplied into the Keon Park to Wollert transmission pipeline. The facility allows gas to be supplied with either Longford gas via the Pakenham to Wollert pipeline or with Moomba gas via the Wollert to Wodonga pipeline.

The existing pressure reduction regulator assembly consists of three runs each with two 200 mm regulators in active and monitor configuration. The assembly provides pressure reduction from 6890 kPag inlet to 2760 kPag outlet. The outlet valves on each of the three runs are fitted with pneumatic actuators for slam shut over-pressure protection of the down stream system.

The regulator assembly includes remote control capability for the following equipment:

- Remote operation of inlet actuated valves for two City gate runs (there are two actuated inlet valves in each run);
- Remote shutoff of outlet valves;
- Outlet pressure set point adjustment (existing).

Annexure 1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ALBURY
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CHILTERN VALLEY
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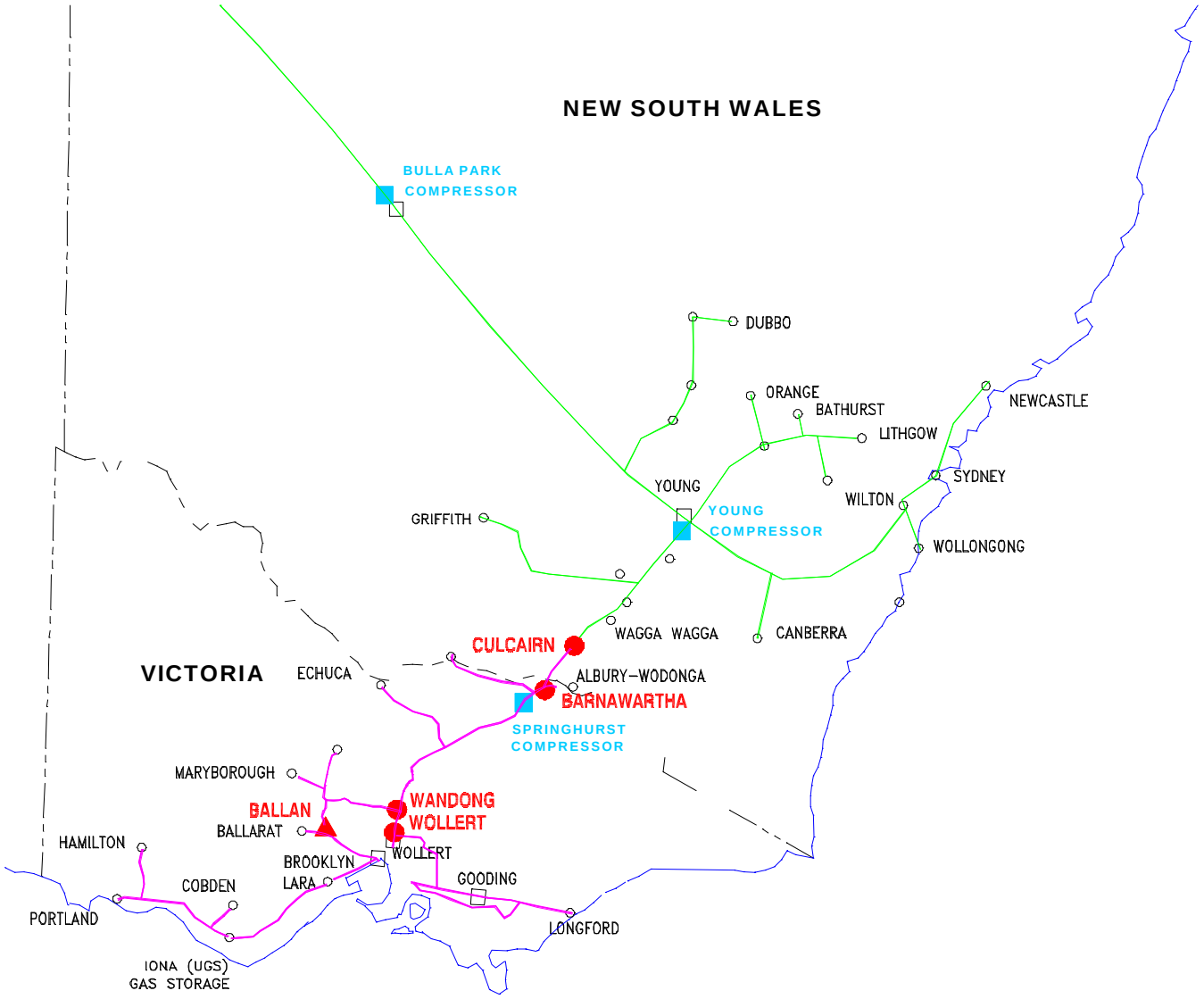
MOOMBA TO MELBOURNE ENHANCEMENT



LEGEND

- GPU GasNet PIPELINES
- AGL/EAPL PIPELINES
- COMPRESSOR STATION
- NEW COMPRESSOR STATION
- NEW PRESSURE/FLOW LIMITER
- NEW ACTUATED VALVE

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Revised Reference Tariffs

The revisions to the existing Reference tariffs for 1999 are shown in Tables 1(a) and 1(b). The revisions apply only to the Transmission tariff volume components for Transmission delivery tariff V and Transmission delivery tariff D, for the zones indicated in Table 1(a), and to the Transmission pipeline supply points indicated in Table 1(b).

The Reference tariff for the new Interconnect zone is shown in Table 2.

The revised price control factors are shown in Table 3.

Table 1(a) Revised Reference tariffs 1999

Transmission delivery tariffs D and V

Tariff no.	Transmission zone	Transmission volume tariff component – calendar year ($/GJ)			
		Pre-revision tariff	Option 1	Option 2	Option 3
1	LaTrobe	0.053	0.2855	0.1361	0.0833
3	Lurgi	0.131	0.3635	0.2141	0.1613
4	Metro	0.079	0.3115	0.1621	0.1093
5	Calder	0.262	0.4945	0.3451	0.2923
6	South Hume	0.106	0.3385	0.1891	0.1363
7	Echuca	0.254	0.4865	0.3371	0.2843
8	North Hume	0.229	0.4615	0.3121	0.2593

Table 1(b) Revised reference tariffs 1999

Transmission pipeline supply point tariffs

Tariff no.	Transmission pipeline supply point	Transmission volume tariff component – calendar year ($/GJ)			
		Pre-revision tariff	Option 1	Option 2	Option 3
1	Carisbrook	0.286	0.5185	0.3691	0.3163
2	Chiltern Valley	0.214	0.4465	0.2971	0.2443

Table 2 Interconnect zone tariff 1999

Transmission zone	Transmission demand tariff component – calendar year ($/GJ)
Interconnect	1.845

The Interconnect zone tariff applies to both injections at Culcairn (south flowing gas) and withdrawals from the Interconnect pipeline (north flowing gas).

The injection rate is paid on the quantity of gas (in GJ) injected into the Principal Transmission System on behalf of a Customer (as defined in the Tariff Order) at Culcairn during the five gas days when the five highest daily quantities of gas (in GJ) were injected into the Principal Transmission System at Culcairn.

The withdrawal rate is paid on the 5 day withdrawal MDQ (as defined in the Tariff Order) for gas supplied from the Barnawartha transmission pipeline supply point into the Interconnect zone. The tariff is additional to the Reference tariffs that would apply in the absence of the Interconnect zone. That is, withdrawals from the Interconnect zone must pay the Interconnect zone tariff in addition to the applicable Reference tariff for withdrawals through the Barnawartha transmission pipeline supply point.

Table 3 Revised price control factors ATT

Year	ATT ($99/GJ)			
	Pre-revision published tariff	Option 1	Option 2	Option 3
2000	0.300980	0.531506	0.384215	0.332117
2001	0.297838	0.299082	0.381069	0.328946
2002	0.298204	0.299427	0.381433	0.329297

The methodology describing the use of the ATT factors in the price control formulae is given in the Tariff Order. Each year the ATT factors will be modified by the appropriate CPI-X factor as described in A3.4 of the Tariff Order.

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Supplementary Access Arrangement Information

Tariff Proposals for the Interconnect Assets

1 Introduction

GPU GasNet proposes to include the capital cost of the Interconnect, the Springhurst Compressor and the Valves within the GPU GasNet Capital Base. The Capital Base will be augmented by these capital costs from the date when each asset was available for use. The capital costs to be included in the Capital Base are:

Table 1: Capital Costs

	Capital Cost	Date included
Interconnect	$19.5 m	15 July 1998
Springhurst Compressor	$16.5 m	31 May 1999
Valves	$4.4 m	31 May 1999

Note: the cost of the Springhurst Compressor has been reduced from the actual capital cost by a contribution of $2.2M from the Victorian Government.

The inclusion of these assets in the Capital Base will require a revision to the approved Reference Tariffs described in the Victorian Gas Industry Tariff Order. This section describes the changes required to the published zonal Reference Tariffs, and introduces a new Interconnect zone to which a zonal tariff will apply. It also describes the amendments to the relevant price control factors for the years 2000 to 2002 inclusive.

This supplementary Access Arrangement Information must be read in conjunction with the original Access Arrangement Information approved by the Commission on 16 December 1998 and the Application for Revision to Access Arrangement to which this document is Annexed.

2 Tariff Proposal

The revised Reference Tariffs will recover the full capital cost of the included assets, and the forecasted operating and maintenance costs over time.

As discussed in the Application for Revision to Access Arrangement, the benefits conferred by the assets are system-wide, and as a matter of principle the associated costs should be regarded as common costs, to be charged to the beneficiaries of the system-wide benefits on an equitable basis. However given that the Interconnect constitutes an extension to the Principal Transmission System, GPU GasNet believes that it is appropriate to define a new zone for this extension, and to levy a small charge for its use. The Interconnect zone will be defined as both an injection and a withdrawal pipeline, with a single tariff which applies to flows in either direction. The level of the zonal injection/withdrawal tariff is determined in consideration of the following factors:

- the tariff should not inhibit competition between NSW and Victoria, and

- the tariff should recognise the risk to revenue recovery from gas swaps on the Interconnect.

An appropriate charge is obtained if 8% ($1.6 m) of the capital cost of the Interconnect Pipeline is recovered from the zonal charge. As shown below, this cost allocation generates a tariff which lies between the fronthaul and backhaul tariffs applying on the EAPL pipeline system on an equivalent rate per km.

The remaining costs, which include all operating and maintenance costs, the capital cost of the Springhurst Compressor and Valves, and the residual 92% of the capital cost of the Interconnect Pipeline, will be treated as common costs, and will be recovered by an equal increase in the Transmission volume tariff component for those zones and transmission pipeline supply points which benefit from the system-wide benefits provided by these assets.

This method of cost allocation is based on the premise that the system-wide benefits are enjoyed equally by all users, in proportion to their use of the system. It is not dependent on the location of withdrawals, nor on the level of peak demand of each user. Hence it is most equitable to allocate the costs as a fixed charge per GJ of usage, in the same manner that indirect, non-locational costs are allocated within the GPU GasNet Principal Transmission System tariff methodology.

The increased charge will be allocated to withdrawals from the Principal Transmission System, excluding the users of the Western System (who are not connected to the Principal System in 1999) and users in NSW (who cannot as a whole be apportioned costs through this Access Arrangement).

Table 2: Cost Allocation Basis

	Capital Cost	*O&M (annual)*	*Cost Pool*	*Charging Basis*
Interconnect Zonal	$1.6 m	-	Locational Peak	Peak Injection & Peak Delivery Charges
System-Wide Benefits				
- Residual Interconnect	$17.9 m	$0.12 m	Common	Anytime Delivery
- Springhurst Compressor	$16.5 m	$0.09 m	Anytime	Charge
- Valves	$4.4 m	$0.01 m		

Note: The O&M cost for the Springhurst Compressor is $0.10 m in 1999 and $0.09 m thereafter (in real terms). This assumes some marginal use of the compressor in 1999 followed by operation in a stand-by mode only in subsequent years. An additional cost of $0.095 m is incurred in 1999 to cover consulting advice used in the preparation of this Application.

2.1 Tariff Structure

The revised tariffs will apply from 1 January 2000. This date has been selected as the most likely date for approval of these tariffs by the ACCC. The revised tariff rates are shown in Annexure 2.

The Interconnect zonal tariff will be charged on peak flows in both directions. This principle differs from that used for other zones in the GPU GasNet tariff structure, where tariffs apply only to flows in the "predominant direction". However, approximately equal quantities are forecast to flow in both directions on the Interconnect, hence it is appropriate on the basis of fairness to charge the same rate on flows in either direction. The tariff rate for flows into NSW will apply to the sum of the flows into NSW on the five peak withdrawal days, as defined within the North Hume tariff zone. The tariff rate for injections into Victoria will apply to the sum of the injections into Victoria on the five peak injection days at Culcairn.

The increase in the Transmission volume tariff component applies to both Tariff D and Tariff V withdrawals from all points in the Principal Transmission System, excluding the Western System, and excluding flows to NSW from the Barnawartha transmission pipeline supply point. The revised tariffs have been calculated as they would apply in 1999. The 1999 tariffs form the base from which the year 2000 tariffs will be reset by application of the transmission price control formulae.

2.2 Detailed Cost Data

The detailed cost break-down for the Interconnect, the Springhurst Compressor and the Valves is shown in section 6.1 of the Application for Revision.

2.3 Tariff Methodology

GPU GasNet is proposing three alternative methods for the calculation of the revised tariffs. As discussed in section 7.2 of the Application, GPU GasNet prefers Options 1 or 2, but the matter is ultimately one for the Commission..

Option 1	Recovery of capital costs in one year (2000).
Option 2	Recovery of capital costs over the first regulatory period 2000 to 2002 inclusive.
Option 3	Recovery of capital costs over the full economic life of the assets.

The capital costs that are recovered over these periods comprise the costs of the Springhurst Compressor, the Valves, and 92% of the cost of the Interconnect Pipeline. For simplicity, the capital cost attributed to the Interconnect zone (8% of the capital cost of the Interconnect Pipeline) is recovered over the full economic life in all options. It should be noted that the decision to recover costs over shorter periods in Options 1 and 2 does not imply that the associated assets will be de-commissioned. It is simply a means to relate the period of payment with the period over which the principal benefits will be obtained.

The tariff methodology for each option is described below. The broad principles and parameters underlying the calculations are the same as those used in the GPU GasNet Access Arrangement for the Principal Transmission System, including:

- Pre-tax real WACC of 7.75%;
- CPI annual escalation rate of 2.5%; and
- Forecast volumes as used in the existing tariff model, despite changed perceptions since the approval of the GPU GasNet Access Arrangement. This preserves the original intent of the incentive based regulation.

The economic lives assumed for Option 3 are:

- Interconnect 2033 (economic life of other pipeline assets)
- Springhurst Compressor 2028 (30 year technical life)

The tariffs have been calculated with the same methodology used to determine tariffs in the other zones of the Principal Transmission System. The method is referred to in the National Access Code as the NPV method. In broad terms this method aims to equate the NPV of the revenue requirement over the first regulatory period with the NPV of the forecast revenues (where the annual revenue requirement is determined by the cost of service model based on the assumed depreciation profile). The detailed steps are:

- Calculate the target revenue (or revenue requirement) each year from the commissioning date, using a cost of service model, allowing depreciation over the periods specified for each of Options 1 to 3. The cost of service includes the forecast annual operating and maintenance costs.
- Determine forecast chargeable volumes each year, commencing 1 January 2000.
- Set a tariff escalating at CPI – 2.7% to earn a revenue stream from the forecast chargeable volumes.
- Set the tariff for 1999 so that the NPV of target revenues over the period 1998 to 2002 equates to the NPV of the forecast and actual revenues over the same period.

2.4 Results – Interconnect Zonal Tariff

Costs for the Interconnect zone are allocated as shown in Table 2.

Table 3: Target Revenue – Interconnect Zonal Tariff (Options 1,2 and 3)

Year ending 31 December

	1998 $m	1999 $m	2000 $m	2001 $m	2002 $m
Return on Assets	0.056	0.121	0.120	0.120	0.119
Depreciation	0.021	0.045	0.046	0.047	0.048
O&M	0	0	0	0	0
Total	0.077	0.166	0.167	0.167	0.167

Note: Interconnect is fully depreciated at end 2033.

Table 4: Forecast Chargeable Volumes on Interconnect Zone (Options 1,2 and 3)

Year ending 31 December

	1998 TJ	1999 TJ	2000 TJ	2001 TJ	2002 TJ
5-day peak Injections (North-South)	0	0	70	70	70
5-day Peak Withdrawals (South-North)	0	0	78	78	78
Total Injections and Withdrawals	0	0	148	148	148

Note: Forecasts are from the GPU GasNet Access Arrangement:

- Injection volumes north-south are 5 PJ per annum at 13.7 TJ/day which is 70 TJ over 5 days.
- Withdrawal volumes south-north are 3 PJ per annum at peak 17 TJ/day which is 78 TJ over 5 days, allowing for the daily profile.
- Tariffs commences from January 2000.

Table 5: Forecast Tariffs and Revenues –Interconnect Zone (All Options)

	1998	1999	2000	2001	2002
Zonal Tariff $/GJ	-	1.8451	1.8156	1.8120	1.8083
Revenues $ m	0	0	0.269	0.269	0.268

2.5 Results – System-Wide Tariff

Table 6a and 6b: Target Revenue

Table 6a: Residual Interconnect System-Wide Target Revenue

Year ending 31 December

	1998 $m	1999 $m	2000 $m	2001 $m	2002 $m
Return on Assets					
-Option 1	0.649	1.147	0.588	0	0
- Option 2	0.649	1.266	0.973	0.665	0.341
- Option 3	0.649	1.394	1.388	1.381	1.372
Depreciation					
-Option 1	3.398	7.398	7.583	0	0
- Option 2	1.875	4.083	4.185	4.290	4.397
- Option 3	0.236	0.514	0.527	0.540	0.553
O&M	0.055	0.119	0.122	0.125	0.128
Total					
-Option 1	4.101	8.664	8.293	0.125	0.128
- Option 2	2.578	5.468	5.280	5.079	4.866
- Option 3	0.939	2.027	2.036	2.046	2.054

Note:

Option 1 Interconnect is fully depreciated at end 2000.
Option 2 Interconnect is fully depreciated at end 2002.
Option 3 Interconnect is fully depreciated at end 2033.

Table 6b: Springhurst Compressor and Valves System-Wide Target Revenue

Year ending 31 December

	1998 $m	1999 $m	2000 $m	2001 $m	2002 $m
Return on Assets- Option 1 - Option 2 - Option 3	0 0 0	0.958 0.958 0.958	1.055 1.400 1.641	0 0.957 1.624	0 0.490 1.605
Depreciation -Option 1 - Option 2 - Option 3	0 0 0	7.788 3.445 0.418	13.616 6.022 0.730	0 6.173 0.748	0 6.327 0.767
O&M	0	0.205	0.100	0.103	0.105
Total -Option 1 - Option 2 - Option 3	0 0 0	8.951 4.607 1.580	14.771 7.523 2.471	0.103 7.232 2.475	0.105 6.923 2.477

Note:
Option 1 Springhurst Compressor is fully depreciated at end 2000.
Option 2 Springhurst Compressor is fully depreciated at end 2002.
Option 3 Springhurst Compressor is fully depreciated at end 2028.

Table 7: Forecast Chargeable Volumes on System – System-Wide Benefits

Year ending 31 December

	1998 PJ	1999 PJ	2000 PJ	2001 PJ	2002 PJ
Annual Withdrawals -Option 1 - Options 2 and 3	0 0	0 0	209.4 209.4	0 216.8	0 220.6

Note: Forecasts are from the GPU GasNet Access Arrangement:

- Annual volumes are the forecast withdrawals from Principal Transmission System excluding Western System and NSW exports.
- Tariffs commences from January 2000.

Table 8a and 8b: Forecast Tariffs and Revenues – System-Wide Tariff

Table 8a: Interconnect System-Wide Revenues

	1998	1999	2000	2001	2002
System-Wide Tariff $/GJ -Option 1 - Option 2	0 0	0.1120 0.0400	0.1102 0.0394	- 0.0393	- 0.0392

- Option 3	0	0.0156	0.0153	0.0153	0.0152
Revenues $ m					
-Option 1	0	0	23.081	-	-
- Option 2	0	0	8.246	8.518	8.653
- Option 3	0	0	3.204	3.309	3.362

Table 8b: Springhurst Compressor and Valves System-Wide Revenues

	1998	1999	2000	2001	2002
System-Wide Tariff $/GJ					
-Option 1	0	0.1205	0.1186	0	0
- Option 2	0	0.0431	0.0424	0.0423	0.0422
- Option 3	0	0.0147	0.0145	0.0145	0.0144
Revenues $ m					
-Option 1	0	0	24.835	0	0
- Option 2	0	0	8.884	9.177	9.322
- Option 3	0	0	3.036	3.136	3.186

2.6 Revised Price Control Parameters

The Victorian Gas Industry Tariff Order specifies the parameters and formulae that control the re-setting of tariffs each year. The principal control parameter is the Average Transmission Tariff (ATT) which is published in the Tariff Order for the years 2000 to 2002 inclusive. The ATT is the average price which will generate the forecast revenue if the forecast annual volumes are achieved. The ATT factors must be revised to include the increase in forecast revenues arising from the recovery of the additional costs of the Interconnect and the Springhurst Compressor. The forecast volumes have not changed from those used in the original Access Arrangement.

The method to calculate the revised ATT factors is:

(a) Determine incremental forecast revenues.
(b) Calculate revised Average Transmission Tariff by dividing the forecast system withdrawal volumes into the adjusted revenues.
(c) Adjust back by CPI-X escalator.

Table 9 summarises the additional forecast revenues for the 3 options.

Table 10 calculates the revised ATT factors including the additional revenues from the incremental capital, and the forecast annual volumes, and adjusts back by the CPI-X escalator. The revised ATT factors will replace the values appearing in the current Tariff Order.

Table 9: Additional Forecast Tariffed Revenues

Revenues ($m)	2000	2001	2002
Interconnect Zone	0.269	0.269	0.268
Interconnect System-Wide Option 1	23.081	0	0

Option 2	8.246	8.518	8.653
Option 3	3.204	3.309	3.362
Spring/Valves System-Wide			
Option 1	24.835	0	0
Option 2	8.884	9.177	9.322
Option 3	3.036	3.136	3.186
Total Additional Revenue			
Option 1	48.185	0.269	0.268
Option 2	17.398	17.964	18.242
Option 3	6.508	6.714	6.815

Table 10: Calculation of Revised ATT

	2000	2001	2002
Incremental Revenues ($m)			
Option 1	48.185	0.269	0.268
Option 2	17.398	17.964	18.242
Option 3	6.508	6.714	6.815
Volume (PJ)	212.422	219.777	223.640
Incremental ATT ($/GJ)			
Option 1	0.2268374	0.001222	0.001198
Option 2	0.081903	0.081736	0.081571
Option 3	0.030639	0.030549	0.030474
Adj. Factor (CPI-X)	0.984	0.996	0.994
Incremental ATTs ($(99)/GJ)			
Option 1	0.230526	0.001244	0.001223
Option 2	0.083235	0.083231	0.083229
Option 3	0.031137	0.031108	0.031094
Published ATTs ($(99)/GJ)	0.300980	0.297838	0.298204
Revised ATTs ($(99)/GJ)			
Option 1	0.531506	0.299082	0.299427
Option 2	0.384215	0.381069	0.381433
Option 3	0.332117	0.328946	0.329297

Note: The adjustment factor in 1999 is 1, and in subsequent years is adjusted by (1+CPI-X), where CPI is 2.5% and X is 2.7%

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Annexure 4

Extensions/Expansions Policy

5.7.1 Coverage

(a) Subject to clause 5.7.1(c), an *extension* or *expansion* to the *Principal Transmission System* is covered by this Access Arrangement.

(b) Prior to an *extension* or *expansion* coming into service, TPA will give notice to the Regulator specifying:

(1) the location of the *extension* or *expansion*;

(2) its costs;

(3) its length;

(4) any other matter TPA considers relevant.

(c) Subject to clause 5.7.1(d), a significant *extension* will not be covered by this Access Arrangement if TPA gives written notice to the Regulator (which notice may be given together with a notice under clause 5.7.1(b)) before the *extension* comes into service that the *extension* will not form part of this Access Arrangement.

(d) Clause 5.7.1(c) does not apply where:

(1) a party successfully seeks *coverage* of the *extension* under section 1 of the Victorian Access Code; or

(2) the *extension* was assumed and included in the calculation of the *Reference Tariffs.*

(e) For the purposes of clause 5.7.1(c), a significant *extension* is an *extension* where:

(1) the cost of the *New Facility* which comprises the *extension* is greater than $5 million; or

(2) the *extension* exceeds 10 kilometres in length.

(f) Notwithstanding any of the preceding provisions of this clause 5.7.1, the *extension* representing the natural gas pipeline extending from Barnawartha (Vic) to Culcairn (NSW) ("the Interconnect") shall be dealt with in the following way:

(1) a notice under paragraph 5.7.1(b) shall be deemed to have been given;

(2) no notice under paragraph 5.7.1(c) shall be given.

5.7.2 Effect of Extension/Expansion on Reference Tariffs

(a) Where the *New Facilities Investment* passes the *Economic Feasibility Test*, the *New Facility* is included in the *Capital Base* and is charged the *Reference Tariffs*.

(b) Where the *New Facilities Investment* does not pass the *Economic Feasibility Test*, the standard procedure is that:

(1) a proportion of the *New Facility* corresponding to the proportion of the *New Facilities Investment* that passes the *Economic Feasibility Test* is included in the *Capital Base* and is charged the *Reference Tariffs*; and

(2) the proportion of the *New Facilities Investment* that does not pass the *Economic Feasibility Test* may, at TPA's election, be -

(A) recovered by a *Surcharge* approved by the *Regulator* under section 8.25 of the Victorian Access Code and levied on *Users* of *Incremental Capacity*;

(B) recovered by a *Capital Contribution* a *User* agrees to pay TPA which may be assumed to be a *Surcharge*;

(C) included in a *Speculative Investment Fund* under clause 5.3.4 of the *Reference Tariff Policy*; or

(D) recovered by a combination of these options.

(c) *New Facilities Investment* that does not pass the *Economic Feasibility Test* may be recovered outside the standard procedure in clause 5.7.2(b) where:

(1) TPA and/or *Users* satisfy the Regulator that the *New Facilities Investment* passes the *System-Wide Benefits Test*, in which case the Regulator may approve higher *Reference Tariffs* for all *Users* and the *New Facility* may be included in the *Capital Base*; or

(2) the *New Facility* is able to be included in the *Capital Base* on grounds that it is necessary to maintain the safety, integrity or contracted capacity of the Reference Services.

5.7.3 Submissions to vary an Access Arrangement

For the avoidance of doubt:

(a) if, pursuant to the *Extension*/*Expansion* Policy set out in the clauses above, an *extension* or *expansion* becomes covered by this Access Arrangement, that coverage shall not be deemed to be a change to this Access Arrangement;

(b) if pursuant to this clause or to the *Extension*/*Expansion* Policy set out in the clauses above, a *Surcharge* is to be applied, the application of that *Surcharge* shall not be deemed to be a change to this Access Arrangement;

(c) notwithstanding clause 5.7.3(b) above, solely for the purposes of public consultation, a notice given under section 8.25 of the Victorian Access Code, shall be treated with as if it were the submission of a revision under section 2.28 of that Code; and

(d) where any submission to vary this Access Arrangement has the consequence that Reference Tariffs will be changed, section 2 of the Victorian Access Code shall apply.

GPU GasNet Pty Ltd
Application for Revision to Access Arrangement

Annexure 5

VENCorp Paper

Please see attached.(Text only)

V E N C o r p

System Security Benefits of the Interconnect and the Springhurst Compressor

Introduction

GPU Gasnet has asked VENCorp to prepare a paper which sets out the VENCorp view as to the system security benefits provided to Victorian gas consumers by the Interconnect pipeline and the Springhurst Compressor station. We understand that a demonstration of system-wide benefits may be used to justify roll-in of certain assets to the GPU Gasnet Capital Base.

This paper is limited to a discussion of the physical benefits to system security from these facilities, which is our area of responsibility and expertise. We do not comment on any potential benefits that may flow from increased competition in the gas market.

Summary

- Considered alone, the Interconnect has and will continue to provide benefit to the total system in the event of a gas supply emergency.

- The Springhurst Compressor through significantly increasing the capacity of the Interconnect has increased system security for Winter 1999.

The Gas Transmission System prior to the construction of the NSW Interconnect

Prior to the completion of the Interconnect the Gas Transmission System was supplied from a single source of gas at Longford. This gas is transported to Melbourne via a high pressure pipeline that is duplicated along part of its length. Since 1969 Victorian gas consumers have relied upon the integrity of this gas source and of the single pipeline. The capacity of this pipeline is 990TJ/day in comparison to the forecast peak day demand of 1039TJ for an average winter in 1999 and 1114TJ for a 1 in 20 winter.

In 1976 the then Gas & Fuel Corporation prepared plans for an LNG Storage facility near Melbourne, which was commissioned in 1980. The purpose of this facility was to provide system security in conjunction with a needle peak shaving function. The LNG storage capacity is limited to about one day's average system demand and the facility cannot easily or economically be refilled during winter or during periods of supply disruption. The main purpose of the facility in a severe disruption is to manage a controlled shut-down of the system without loss of pressure in the pipes, which could lead to the risk of air entering the distribution pipes potentially causing a serious danger to life and property.

The Interconnect

Construction of the Interconnect commenced in November 1997. This was a joint EAPL/GPU GasNet project. EAPL took ownership of approximately 60% of the connection and GPU Gasnet took the remainder. A foundation contract of 5 PJ/year and 14TJ/day north to south was established with Energy21 before construction.

Following the Longford "ice blockage" incident in June 1998, TPA and EAPL accelerated the schedule and the Interconnect was commissioned on 10 July 1998.

The Interconnect alone (without compressor augmentation) can supply 35 TJ/day into Victoria. This can be higher depending on demand conditions in NSW and Victoria.

The Interconnect played a vital role during the Longford Gas Emergency that commenced on 25 September 1998 and lasted until restrictions were lifted after 13 October. Gas from the Interconnect supplemented LNG during the curtailment process and enabled pressures to be stabilised. Thereafter the priority users (hospitals, nursing homes, etc) were supplied with gas from the Interconnect. Total flow through the Interconnect over this period was 440 TJ with a peak flow of 44TJ on the 26 September.

The system security benefits of the Interconnect were demonstrated in the Longford Crisis. The Interconnect could also provide security during less serious emergencies, such as compressor failures or pipeline leaks that could reduce gas flows to Northern Victoria and result in unplanned curtailment of industry in the region.

The Springhurst Compressor

GPU GasNet installed the Springhurst Compressor[1] as a key component of the Moomba-Melbourne Augmentation Project (MMAP), as part of the Victorian Government's Winter-99 contingency project to secure Victoria's gas supplies over the winter of 1999. The other components of the MMAP are a GPU Gasnet compressor on the EAPL main line at Bulla Park, NSW, and a GPU Gasnet compressor on the EAPL branch line at Young, NSW. The Governments Winter 99 Contingency Project is discussed in more detail in Appendix A.

The Young and Springhurst compressors expand the nominal capacity of north-south flows through the Interconnect from 35 TJ/day to 92 TJ/day. In fact, during testing in May a flow of 98TJ/d was achieved. The Bulla Park compressor maintains required supplies from the EAPL system on days of high demand in NSW that can coincide with peak demand days in Victoria. The Young compressor increases the Interconnect capacity from 35TJ/d to 60TJ/d. The Springhurst compressor provides a further 32TJ/d increase to 92TJ/d and has therefore increased system security for winter 1999.

The future Young, Bulla Park and Springhurst compressors after Winter 1999 is not yet clear, as the arrangements need to be finalised between GPU Gasnet and EAPL. The imperative was to have the compressors operational for Winter 1999. In the event that the Young and Bulla Park compressors were to be removed before winter 2000, the Interconnect capacity would be reduced to 50TJ/d of which 15TJ/d could be attributed to the Springhurst compressor and 35 TJ/d to the Interconnect without compression. As it stands there is insufficient information available for VENCorp to appraise the system security benefits of the Springhurst Compressor post- 1999.

[1] All references to the Springhurst Compressor include the 5 flow control regulators and valves installed on the GPU Gasnet system to manage flows from multiple sources.

Appendix A

The Winter-99 Contingency Project

Following the Longford Gas Emergency it became apparent to the Victorian Government that there was a serious risk that the Longford No.1 plant might not be reinstated in time for the winter peak in 1999. If Gas Plant No. 1 was completely unavailable it was understood at the time that the injection capacity at Longford would be reduced from its normal level of 990 TJ/day to as low as 650 TJ/day, resulting in severe curtailments and economic disruption. The Victorian Government constituted a number of working parties to develop contingency plans to mitigate the risks and avoid involuntary curtailments. These working parties included Government consultants, GPU Gasnet and VENCorp. The goals of the project were to:

i) Identify the contingency measures that could make up the potential shortfall in Longford supply.

ii) Evaluate the options and recommend a preferred strategy, considering:
- the cost of each option,
- the likelihood of success within the available timeframe.

iii) Develop the detailed plans to implement the preferred options.

The government commissioned a number of consulting firms to evaluate the supply risks and the viability and cost effectiveness of the alternative supply options (Trowbridge, Stone & Webster). The consultants and working parties surveyed a range of options.

The three preferred options based on cost effectiveness or feasibility were the Moomba-Melbourne Augmentation Project (MMAP), Port Campbell Production and the South West Pipeline (SWP), and Demand Management

Of these, the MMAP was assessed as having the highest probability of being achieved within the required timeframe, once the ability to source compressors had been confirmed by GPU Gasnet. The production and processing facilities were already in place at Moomba, and EAPL had the ability to offer linepack to enhance capacity.

The first two options were delegated to GPU Gasnet for detailed design, costing and implementation after final approval from the Victorian Government.

The other options were eliminated as not cost effective or assessed as of low feasibility:

- propane-air peak shaving,
- LNG imports,
- expansion of the existing LNG plant,
- installation of new dual fuel facilities at a large number of industrial plants,
- portable LPG heating, and
- subsidised weatherisation and efficient appliances.

The Moomba-Melboume Augmentation Project

The Springhurst Compressor[2] is a key component of the Moomba-Melboume Augmentation Project (MMAP), which is part of the Victorian Government's Winter-99 contingency project to secure Victoria's gas supplies over the winter of 1999. The other components of the MMAP are a GPU Gasnet compressor on the EAPL main line at Bulla Park, NSW, and a GPU Gasnet compressor on the EAPL branch line at Young, NSW. Together these three compressors expand the capacity of north-south flows through the Interconnect from 35 TJ/day to 92 TJ/day.

The Young and Springhurst Compressors are required to boost the capacity of the Interconnect. The compressors are appropriately sized and located for their design purpose.

The Young and Springhurst Compressors are each powered by a single Solar Centaur unit. There is no duplicate compressor at either station. The Young site has access to the spare EAPL mainline compressor capacity that is located adjacent to the GPU GasNet unit. However, the failure of the single unit at the Springhurst Compressor would lead to a reduction in capacity of the interconnect from 92 TJ/day to 60 TJ/day. The difference of 32 TJ/d is the flow benefit attributable to the installation of the Springhurst compressor during Winter 1999

The Bulla Park compressor is powered by a Solar Mars unit. The compressor is located adjacent to EAPL mainline compressors that include a redundant unit.

VENCorp understands the basis of the MMAP design and accepts the design as prudent for meeting the required capacity. We understand that EAPL was also heavily involved in determining the design on their part of the system

MMAP Utilisation in Winter 99 with Shortfall at Longford

At the time decisions were being made there was no certainty about the availability of supply from Gas Plant 1 at Longford. The impact of a shortfall in supply from Longford was evaluated by Trowbridge . Their evaluation calculated the likely shortfalls in supply under a given reduced supply from Longford, both with and without the planned supplies from the SWP and from Moomba via the Interconnect.

In the absence of any new supply initiatives Trowbridge assumed that the total available peak supply would be 685 TJ/day (650 TJ from Longford and 35 TJ from the Interconnect), with access to LNG for needle peak shaving.

The results of the daily supply-demand balancing exercise carried out by Trowbridge indicated that the following supply contributions could be expected from the expansion of the Interconnect. These values refer to the increase of 57 TJ/day in the capacity of the Interconnect from 35 TJ/day to 92 TJ/day brought about by the MMAP.

The expected days of usage of the enhanced capacity of the MMAP and total PJ to flow would be:

	Days used	**Additional PJ from MMAP**
Average winter	87	3.9 PJ
1 in 20 winter	105	4.3 PJ

[2] All references to the Springhurst Compressor include the 5 flow control regulators and valves installed on the GPU Gasnet system to manage flows from multiple sources.

These volumes are additional to the volume carried by the Interconnect alone (capacity 35 TJ/d) of approximately 3.0 PJ to 4.0 PJ.

Whilst the table above refers to the MMAP as a whole with no separate figures available to assess the effect of the additional capacity provided by the Springhurst compressor in the modelled scenarios, it is clear that the additional Springhurst capacity would be used on a significant number of days and always on high demand days.

John Savage
Manager, Gas Planning

GPU GasNet Pty Ltd
Application for Revision to Access Arrangement

Annexure 6

System Planning Paper

Moomba-Melbourne Augmentation Project - Design Philosophy

1 Background

The Moomba-Melbourne Augmentation Project was initiated in November 1998, following the fire and explosion at Longford on 25 September 1998, and resulting concerns about security of supply in the forthcoming winter 1999. The objectives were to identify the options for augmentation of the pipelines to carry Cooper Basin gas into Victoria, and to proceed with construction of the appropriate facilities.

Prior to the augmentation, the Moomba-Melbourne system had the following characteristics:

1.1 EAPL Mainline

The EAPL pipeline system transports gas through the 1299 km. mainline from Moomba in South Australia to Wilton, near Sydney, with off-takes at a number of localities to serve the NSW market, and significantly at Young where gas is carried to Wagga and onwards to Victoria via the recently completed Interconnect. The mainline has a diameter of 850 mm. and operates at an MAOP[3] of 6200 kPa (6378 kPa Gauge from Moomba to Bulla Park). There are two large compressor stations on the mainline at Bulla Park and Young, located 578 km and 1033 km from Moomba respectively. The Bulla Park Station consists of two 4400 kW compressor units, and the Young Station contains two compressor units rated at 4500 kW each for mainline compression.

1.2 Young-Wollert pipelines

The pipelines between Young and Wollert (near Melbourne on the GPU pipeline system) have a total length of 536 km and essentially consist of two small diameter (300 mm) laterals joined by a larger diameter Interconnect pipeline (450 mm). Prior to the augmentation these pipeline sections were un-compressed, and the south-flowing capacity was restricted to no more than 20 TJ/day under Winter conditions for firm service (a capacity of 35 TJ/day is available on an interruptible basis). The capacity was limited by the low pressures typically available at Young relative to the GPU pipeline pressures in northern Victoria, and by the significant length of small diameter pipeline.

1.3 Victorian System Dynamics

[3] Maximum Allowable Operating Pressure. This is the licensed pressure that cannot be exceeded during pipeline operations.

The pipeline control systems in Victoria were designed primarily to transport gas from Longford to Victorian markets and northward to the northern Victorian and Albury load centres. In terms of capacity, the Wollert-Albury section was designed for taking gas northward to these localised markets, and significant volumes of gas from NSW were not anticipated. With the original configuration of regulators and valves, significant flows of gas from the north could have difficulty entering the Melbourne system due to back pressure from Longford gas, and flow optimisation with the proposed compression required a reconfiguration of these regulator facilities. Certain pipelines were also at risk of exceeding MAOP from higher pressure gas from NSW without appropriate over-pressure control facilities.

2 Capacity Considerations on the EAPL Mainline

Aside from the restricted capacity of the Young-Wollert pipelines, the primary consideration was determining the capacity enhancements, if any, that were required on the EAPL mainline.

This pipeline had a capacity of 470 TJ/day (before augmentation) subject to pressure and other critical operating parameters, but peak deliveries are typically 440 + TJ/day, consisting of 13.7 TJ/day to Culcairn and the remainder to NSW delivery points. The (+) indicates that on 2-3 days a year the demand might exceed this level. Therefore there was up to an additional 30 TJ/day that could be delivered to Culcairn without re-inforcement of the EAPL mainline.

Following negotiations between the Victorian Government and the Moomba Producers, it was stated that the injection capacity available at Moomba could be increased for a limited time over the winter '99 period by approximately 70 TJ/day. This was available without installing expensive new production and processing facilities at Moomba and in the gas fields. System modelling also concluded that the peak day delivery capacity on the EAPL mainline could be enhanced to deliver a total of 92 TJ/day at Young if additional compressor capacity was installed at Bulla Park (and sufficient compression was installed on the Young to Wollert pipeline). This volume is only achievable by utilisation of the line-pack in the pipeline to deliver peak day quantities. Pipeline operation is such that during weekdays when demand in NSW is high, more gas is taken out of the pipeline than is put in, to be replenished on weekends when NSW demand is lower.

By this means, it was possible to significantly increase the deliverability of the EAPL mainline without significant expenditure on production capacity at Moomba, and at minimum cost for pipeline re-inforcement. The firm peak day capacity made available at Young which may be potentially available for transport into Victoria through the Interconnect by this strategy is 78 TJ/day, in addition to the existing 14 TJ/day.

3 Capacity Upgrading of Young to Wollert Pipeline

Despite the availability at Young of over 90 TJ/day from the EAPL mainline, the lateral from Young to Wollert is itself constrained. The constraint arises from the relatively low pressure available at Young (approximately 4500 kPa after augmentation at Bulla Park when flows into Victoria are high[4]) and the length and small diameter of the pipeline.

[4] The power available from the new compressor at Bulla Park is used to maintain the pressure at Young when flows are high. To increase the pressure at Young at these high flows would require very significant additional power at Bulla Park.

Duplication of the pipeline was rejected because of its expense, and the uncertainty as to whether loops could be installed in the available timeframe. An option initially proposed based on standard system planning models was to install compressors at Young (additional to the existing EAPL units), Uranquinty (near Wagga), and at Springhurst, 30 km south of Wodonga. The design requirements were to meet the minimum delivery pressures at Wodonga (2400 kPa), at Carisbrook (3000 kPa) and Wollert (3000 kPa), without exceeding the MAOP of the pipeline at any point. The Young compressor was designed to lift the pressure of the gas to 8120 kPa, which was the MAOP of the Young-Wagga pipeline. Given that gas pressure falls as gas moves along a pipeline due to frictional effects, Uranquinty and Springhurst in this option were sized and located to lift the pressure back to the MAOP of the adjacent pipeline segments.

Further investigation found that whilst the MAOP of the Young to Wagga pipeline was rated at 8120 kPa, it was feasible to re-rate this pipeline to 8500 kPa. This task was undertaken by EAPL with the approval of the NSW government. The result was that the Young compressor could lift the gas pressure to a significantly higher value, thereby removing the need for the downstream Uranquinty compressor station. This stratagem saved approximately $15 M in investment costs.

The capacity made available by the Young and Springhurst compressors is over 90 TJ/day, raised from an un-compressed firm capacity of no more than 20 TJ/day (under winter conditions). The capacity under this configuration matches the upgraded EAPL mainline capacity. Further evaluations were then undertaken to determine the cost of additional capacity with further compression, but they concluded that the benefit in terms of the limited amount of additional capacity made available was more than outweighed by the significant capital and operating costs involved.

Control Facilities Augmentation

The system models indicated the need to augment facilities on the GPU GasNet transmission system in order to give VENCorp (the system operator) the ability to deliver 92 TJ/day to customers (principally in the metropolitan area) under all system and operational circumstances. Modeling studies indicated the need for a city gate at Barnawartha, pressure limiters at Wandong and Wollert, and an automated line valve at Ballan. (It also became apparent that EAPL would need to upgrade their facility at Culcairn to handle the increase in flow, which was done at their cost).

Barnawartha city gate was required to protect the Wollert to Wodonga pipeline (MAOP 7400 kPa) from damage which could be caused by high pressures in the Young to Wagga Wagga pipeline (MAOP 8500 kPa). The purpose of the pressure protection regulator at Barnawartha is essentially to maintain pressures in the Victorian pipelines below the current operating license pressure of 7400 kPag. The protection system will close the main line valve whenever inlet pressure exceeds 7400 kPag. It can then pass up to 60 000 sm^3/hr. When the high pressure condition has receded, the main line valves can be re-opened, and the regulators can close. The inlet pressure to the regulator station will be approximately 7400 kPag with an expected allowable pressure drop of 500 kPag.

The purpose of the pressure limiter at Wandong is to restrict/control gas flows from the Wollert to Wodonga pipeline system into the Bendigo pipeline system, with Carisbrook as the

control point, and thereby to maximise NSW gas flows to Victoria. The limiter will pass up to 60 000 sm^3/hr with an expected allowable pressure drop of 200 kPag, and a remotely controllable outlet set-point of 3500 to 5500 kPag. The other purpose of the regulator at Wandong will be to provide a pressure protection regulator system to prevent excessive pressure in the Wollert-Wodonga pipeline, with operating pressures of 7400 kPag, entering the Bendigo pipeline system above current operating license pressures of 7390 kPag.

The pressure limiter at Wollert restricts the pressure of NSW gas at Wollert to a remotely set value between 3000 and 5000 kPag, ensuring that flow from NSW to Victoria is neither restricted due to high back pressure nor excessive due to low pressure at Wollert. The Wollert Station has been reconfigured to ensure that the required NSW gas is supplied to Melbourne via an existing Wollert regulator. The limiter will pass up to 150 000 sm^3/hr with an expected allowable pressure drop of 200 kPag and add Victorian gas to the NSW gas as required to control the pressure of NSW gas to the required value, with Carisbrook as the control point. The balance of the Wollert demand will be supplied from Longford through the existing Wollert City Gate. At a set-point of 4500 kPag the limiter will open fully when inlet pressures begin to drop, allowing Longford gas to filter through into the Wollert-Wodonga system and/or into the Wollert City Gate. A further purpose for the regulators at Wollert is to provide a pressure protection regulator system to prevent excessive pressure in the Wollert-Wodonga pipeline, with operating pressures of 7400 kPag, entering the Longford-Pakenham pipeline above current operating license pressures of 7070 to 6890 kPag.

The purpose of the 150mm line valve automation (remote operation) at Ballan is to give VENCorp improved control over linepack movements between the Bendigo and Ballarat pipeline systems while maximising delivery of NSW gas to Victoria.