Business Case

Service provider	APA GasNet Australia (Operations) Pty Limited
Asset	Victorian Transmission System (VTS) (i.e. APA GasNet System as defined under the Service Envelope Agreement (SEA))
Project	Gas to Culcairn Project
Project type	Capex – Growth
Project No	BC175
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Date:	3rd March 2012

PURPOSE

To present a project recommendation and justification for the APA GasNet System for the capacity augmentation to transport an additional 45 TJ/day exports through Culcairn from Iona.

BACKGROUND

The Victorian Transmission System (VTS) is interconnected to the Moomba Sydney Pipeline (MSP) at Culcairn, where gas can be imported or exported between NSW and Victoria. Currently 36 TJ/day is exported from the VTS, and a maximum capacity of 48 TJ/day is available after the commissioning of the Euroa compressor under ideal operating conditions and for a total demand day of approximately 1300 TJ/d on the VTS. Gas can also imported from NSW with a maximum capacity of 117 TJ/d at Culcairn into the VTS.

In the past, Culcairn exports have been considered by AEMO a secondary delivery point on the VTS and curtailed or flows limited whenever there was insufficient capacity in the VTS for exports into NSW. However, with expected developments of gas fired power station on the eastern seaboard of Australia, gas exports from Victoria into NSW are expected to become significant. Accordingly, AEMO has changed its practices and now does not preferentially curtail or limit flows from Culcairn in the event of capacity shortfalls in Victoria.

As approved in the earlier Access Arrangement period, APA GasNet has begun augmenting the transmission pipeline from Wollert to Barnawartha to increase the export capability of the VTS through Culcairn. Stage 1 of the Northern Augmentation project was completed in March 2011 comprising the installation of two Centaur 50 compressors at Wollert Compressor Station, increasing the maximum allowable operating pressure (MAOP) from Wollert to Euroa from 7400 kPa to 8800 kPa and modification of the Springhurst compressor Station to enable bi-directional flow.

Stage 2 of the Northern Augmentation project comprises the installation of a compressor station at Euroa (i.e. one Centaur 50 compressor) and is planned to be operational in winter 2012.

With both Stage 1 and Stage 2 projects implemented, the Northern Zone is able to meet load demand forecast at the various delivery points in northern Victoria and increased Culcairn export capacity up to 48 TJ/day under ideal operating conditions and for a total demand day of approximately 1300 TJ/d on the VTS. Currently, approximately 36 TJ/day of exports are contracted on the NSW side at Culcairn on a “firm” basis, hence there is 12 TJ/day spare capacity on the NSW side at Culcairn available for exports through Culcairn.

The current declared capacity of the South West Pipeline (from Iona to Lara) is 353 TJ/day. Gas supply available from Iona is significantly higher than the capacity of the South West Pipeline. Any additional gas sourced from Iona above 353 TJ/day would require augmentation to the South West Pipeline. Currently, the South West Pipeline is at full capacity, hence any additional volumes of gas from Iona would require augmentation to the South West Pipeline.

IDENTIFICATION OF NEED

[redacted] have advised APA as to expected VTS requirements for accessing gas from Iona for Culcairn exports with the following MDQ and timing.

Table 1: Forecast Gas Volumes to Culcairn from Iona (Incremental Volumes)

	Receipt Point TJ/d	Delivery Point TJ/d		Year
	Iona	Culcairn	Melbourne	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	53	45	8	

These injection and withdrawal volumes are incremental to current injections and withdrawals at Iona and Culcairn, with the exception of the 8 TJ/day expected to be delivered into Melbourne which APA understands will offset injections from Longford.

In its current configuration, the VTS has insufficient capacity to export an additional 45 TJ/day of gas to Culcairn due to capacity constraints in the Northern Zone and also on the South West Pipeline. Augmentations to the VTS would be required in both those sections of the VTS.

1. South West Pipeline Augmentation

Currently, the South West Pipeline is at full capacity, hence the additional 53 TJ/day from Iona would require augmentation to the South West Pipeline.

2. Northern Zone Augmentation

The Northern Zone has insufficient spare capacity to provide an additional 45 TJ/day capacity to Culcairn. Further augmentations would be required on the Wollert to Barnawartha pipeline.

Proposal

The following augmentations are proposed to enable 45 TJ/day additional gas to be exported to Culcairn from Iona:

- Installation of a Taurus 60 5.5 MW compressor station at Stonehaven on the South West Pipeline.
- Lay 104.1 km of 450 mm pipeline Class 600 MAOP 10,200 kPa, looping the Wollert to Barnawartha pipeline, comprising:
    - Wollert to Wandong (27.8 km)
    - Line Valve 12 to inlet Euroa Compressor Station (30.0 km)
    - Outlet Euroa Compressor Station to Line Valve 17 Benalla (46.3 km)

Refer to the schematic in Attachment 1 detailing the required augmentations.

The augmentations above provide sufficient capacity to enable 45 TJ/day to be accessed from Iona through the South West Pipeline and into Culcairn.

EVALUATION OF ALTERNATIVES

Options were considered, which include:

(1) Do Nothing Option

The Shippers will not be able to access gas from Iona and Longford, hence may seek gas supply opportunities from other sources outside the VTS.

The Stonehaven compressor on the South West Pipeline would also be required as it provides other benefits to the VTS (see section 2.1 for justification).

(2) Northern Zone and South West Pipeline Augmentations

(2.1) South West Pipeline Augmentation

A compressor on the South West Pipeline would provide:

- Increased capacity of the South West Pipeline to transport more gas from Iona.
- Security of supply to supplement any shortfall in Longford supplies (in conjunction with the WORM – refer Attachment 3, Reference 1).
- More capacity to refill the Western Underground Storage, supply the Western Transmission System and/or export gas to South Australia.

Site and Compressor Power Options

Two potential sites were considered: Stonehaven and Winchelsea. Two options of compressor powers were also considered for each location, that is, a Centaur 50 (4200kW) or a Taurus 60 (5500kW).

The capacity and cost estimates for the various compressor options at Stonehaven and Winchelsea are shown in Table 1 below:

Table 1: Incremental Capacity and Costs.

Compressor	Incremental Capacity to SWP (TJ/day)	Cost Estimate ($m)
Stonehaven T60	59	38.3
Stonehaven C50	49	34.9
Winchelsea T60	81	40.5
Winchelsea C50	69	37.0

A T60 at Stonehaven or a C50 at Winchelsea would satisfy the requirements of an additional 53 TJ/day of gas through the South West Pipeline. While a C50 at Winchelsea appears to be the least expensive choice, APA does not consider that it would represent the most prudent choice as there are other considerations to be taken into account in the compressor site selection.

- APA GasNet has secured the site for the Stonehaven compressor subject to a planning permit from the local council. Winchelsea is a greenfield site and no planning has yet been done to secure that site. Lead time to construct a compressor at Winchelsea would be significantly longer, and with no certainty, compared to Stonehaven because of additional time required (possible a year or more) to secure land and easement. Considering that the first additional tranche of gas from Iona is required as early as 2013, the lead time to secure a compressor site and easement and approvals is a critical consideration.

- The location of Stonehaven is also more optimal for west bound flows for refilling of the Western Underground Storage and/or exporting gas to South Australia. While Winchelsea provides more capacity for the SWP to flow towards Melbourne, its location west of Stonehaven is not as optimal for westerly flow. The Stonehaven compressor therefore provides greater flexibility for the system under the broader range of gas flow scenarios.

As to date only 53 TJ/day additional capacity has been confirmed as required from Iona, the Stonehaven compressor is the more likely option to achieve that requirement within the given timeframe.

Therefore, the preferred solution is the construction of a Taurus 60 compressor station at Stonehaven, which would be required by winter 2013.

Stonehaven Compressor Station Benefits

If the project of gas exports to Culcairn is not approved, Stonehaven compressor station is still required, based on its justification of its other benefits to VTS as follows:

- As discussed in the WORM business case, the Stonehaven compressor contributes to the security of supply of the VTS. In combination with the WORM, Stonehaven allows gas to be accessed from Iona during an extended Longford outage and reduces the impact to the VTS during the shoulder and winter demand periods.

- Stonehaven would also be contributing to the security of supply to the Western Transmission System, particularly during an event similar to a recent event where all three units of the Otway gas plants had been observed not to operate simultaneously. During such an event, Stonehaven would be able to maintain a minimum pressure of 4500 kPa required to the APA GasNet Iona compressors to enable sufficient compression to meet peak demands on the Western Transmission System. Stonehaven also defers the requirement to upgrade the Iona compressor after-coolers as well as defers any requirement

to increase compression at Iona for the Western Transmission System. This is not possible using the Brooklyn compressors.

- Stonehaven compressor contributes to the downsizing strategy of the Brooklyn compressor site and is strategically better placed for future growth and security of supply.

- Stonehaven would be constructed as a bi-directional compressor, enabling peaking services for east bound demand, and for west bound flows for refilling the Western Underground Storage during summer and shoulder periods and/or gas exports to South Australia.

(2.2) Northern Zone Augmentation

An additional 45 TJ/day would require a looping of 27.8km of 450 mm pipeline from Wollert to Wandong, and 76.3km upstream and downstream of Euroa compressor station to be constructed. The target minimum pressure at Culcairn is a minimum of 6000 kPa. Augmentation requirement on the Young to Culcairn pipeline on the Moomba Sydney Pipeline were considered as part of the planning analyses but are outside the scope of this business case and does not form part of the APA GasNet System.

Pipe Diameters Options

Pipeline sizes of 400 mm, 450 mm and 500 mm were assessed to determine which pipe size would be the most cost efficient in terms of developing the transmission pipeline. The results of the analyses are shown in the table below.

Current Case: Additional 45 TJ/day to Culcairn

Option	Wollert to Wandong (km)	Upstream Euroa (km)	Downstream Euroa (km)	Cost Estimate ($m)
450 mm (Preferred)	27.8	30	46.3	118.6
400 mm	27.8	40.2	46.3	122.5
500 mm	27.8	22.6	46.3	120.4

From the table above, the 450 mm pipeline is the least cost option for the looping. The pipeline looping sections for all three cases were similar, with approximately 10 km more looping required for the 400 mm case and 7 km less looping for the 500mm case. Basically, the looping requirements for the additional 45 TJ/day are driven by removing the constraining sections of the existing 300 mm pipeline, i.e. minimising the pressure drop between the points of large demand offtakes e.g. at Wandong and Echuca and creating sufficient pressure from the Euroa compressor to meet pressure requirements at Culcairn.

In terms of the longer term outlook on the Northern Zone, APA has also performed a high level assessment to transport an additional 190 TJ/day of exports (total 226 TJ/day) and found that a 450 mm pipe looping from Wollert to Barnawartha (approximately 260km in length) would be the minimum requirement for that export scenario. This is consistent with VENCorp's 2030 vision of a 220 TJ/day export case which stated a 450 mm pipe looping requirement from Wollert to Barnawartha (refer Attachment 3, Reference 2).

Therefore, a 450 mm pipe size is considered a prudent pipe size for the current requirements and also for efficient future development of the Northern Zone.

RISK ASSESSMENT

Construction. The proposed project is of a routine nature to APA. However, there is a risk of the Stonehaven compressor project not being completed by winter 2013 because of the very short lead time. APA has already secured the site at Stonehaven. Stonehaven has a significant advantage over the greenfields Winchelsea site which requires at least a year or more to obtain land and secure approvals.

Technical. All construction work would be completed by technically proven contractors, to APA's engineering design and specifications. All construction process was oversighted by APA engineers.

Operation. The new loop and compressor will be operated in accordance with APA's standard management practices for assets of this type. APA has a suitably qualified and experienced workforce in Victoria to perform this type of operation.

Regulatory. NPV for recommended investment is positive and should be regarded as complying with Rule 79 (2b), and therefore should be accepted to Capital Base of VTS at the next regulatory review.

ESTIMATED COST

Capital Expenditure:

The capital cost for the project is detailed in the Table below in 2012 dollars.

Budget for Project $million (2012)	Option 1 Do Nothing	Option 2 Stonehaven Compressor + 104.1km x 450 mm Looping	
		Pipeline	Compressor
Preliminaries, Establishment, Project Management, Approvals		[redacted]	[redacted]
Procurement, Materials		[redacted]	[redacted]
Construction		[redacted]	[redacted]
Total	**0.0**	**118.58**	**38.3**
Other Projects Associated Projects			
Stonehaven Compressor (2014)	38.3		
Total	**38.3**	**156.9**	

The capital costs for the project options are detailed in Attachment 2.

Operating Expenditure:

Annual expenditure to operate and maintain the looped pipeline and Stonehaven compressor (Option 2) has been estimated to be in order of $643,000 per annum. This opex increase is estimated as incremental expenditure to the base operating expenditure and it will form a step change to VTS operating expenditure budgets.

PLAN FOR EFFECTIVE EXECUTION

The requirement for conforming capital expenditure specified in Rule 79(1) is that the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

APA has systems and procedures guiding the development of the capital projects from Concept through to the Delivery phase. For most capital projects over $1m, design and procurement will be carried in-house and the delivery/construction phase will be tendered. If there is a constraint in resources, then the design and procurement could also be tendered out under an Engineering Procurement Contract Process.

JUSTIFICATION

The requirements for justification of conforming capital expenditure specified in Rule 79(2) are as follows:

The capital expenditure must be justifiable on one of the following grounds;

a. The overall economic value of the expenditure is positive, or

b. The present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure, or

c. The capital expenditure is necessary;

   i. To maintain and improve the safety of services, or

   ii. To maintain integrity of services, or

   iii. To comply with regulatory obligation or requirement, or

   iv. To maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or

d. The capital expenditure is an aggregate amount divisible into two parts, one referable to incremental services and the other referable to a purpose referred to in paragraph "c", and the former is justifiable under paragraph "b" and the latter under paragraph "c".

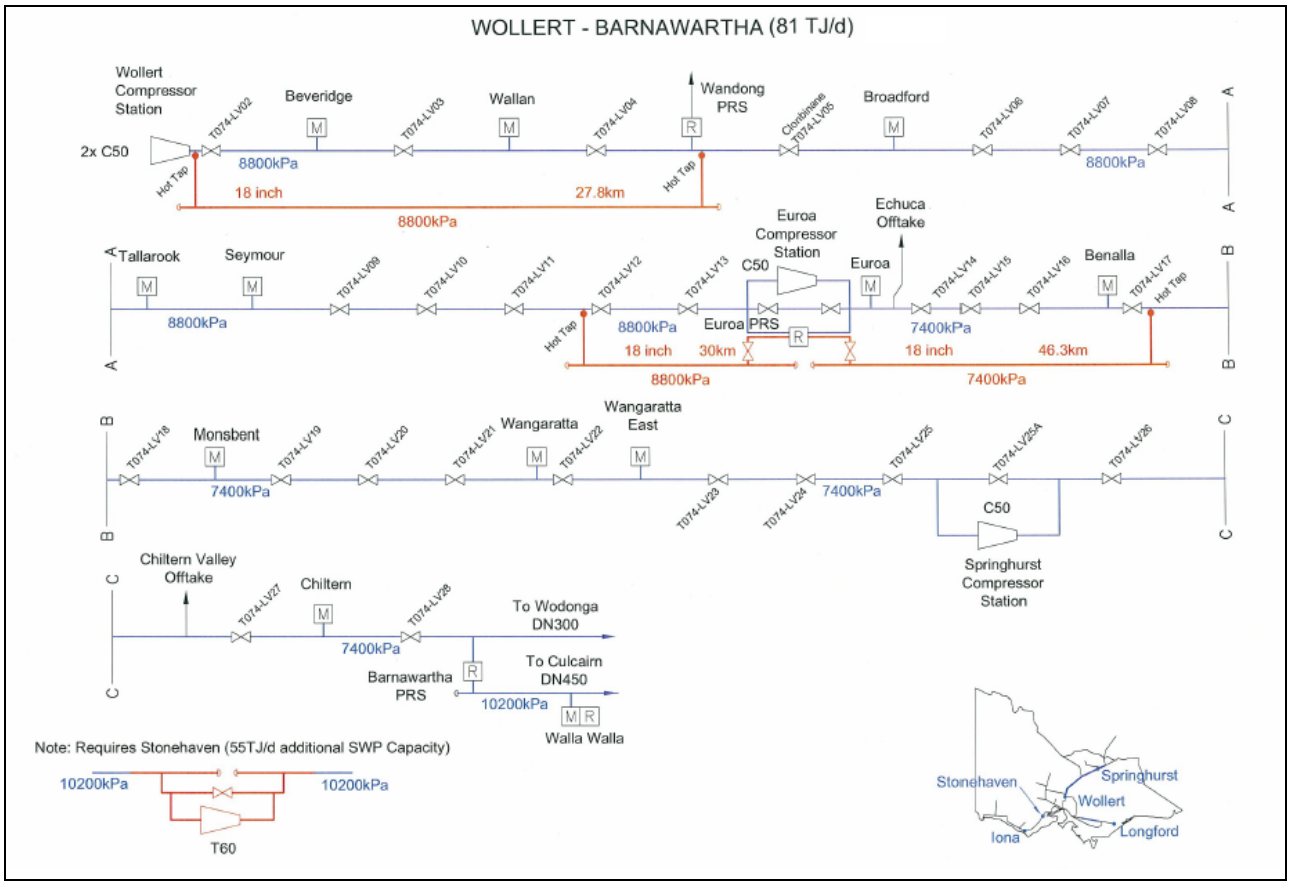
APA is of the opinion that the above presented capital project meets the criteria of Rule 79(2)b, that is the project has achieved a positive net present value, hence the capital expenditure is justified under Rule 79(2)b as conforming for the purpose of its inclusion into the Capital Base of the APA GasNet System.

RECOMMENDATION

A Taurus 60 compressor station at Stonehaven and 104.1 km of 450 mm pipeline looping of the Wollert to Barnawartha pipeline is the most efficient and prudent investment to augment the capacity of South West Pipeline and the Northern Zone. The project will be fully operational by Jan 2015 with Stonehaven compressor targeted to be completed in 2013.

If the 45 TJ/day gas exports to Culcairn is not approved, it is still recommended that the Stonehaven Taurus 60 compressor proceed as the most efficient and prudent investment to augment the capacity of the South West Pipeline based on its security of supply and stay-in-business benefits to the VTS.

ATTACHMENT 1: Schematic of VTS Augmentations



ATTACHMENT 2: Capital Cost Details

The capital cost for the options are detailed below in 2012 dollars.

A2.1 Compressor Options: Capital Cost details

$million (2012)	Winchelsea Compressor Taurus 60	Stonehaven Compressor Taurus 60	Winchelsea Compressor Centaur 50	Stonehaven Compressor Centaur 50
Preliminaries, Establishment, Project Management, Approvals, Land	[redacted]	[redacted]	[redacted]	[redacted]
Procurement, Materials	[redacted]	[redacted]	[redacted]	[redacted]
Construction	[redacted]	[redacted]	[redacted]	[redacted]
Total	**40.524**	**38.328**	**36.975**	**34.871**

A2.2 Looping Diameter Options: Capital Cost details

Budget for Project $million (2012)	Pipe Size		
	450mm	400mm	500mm
Preliminaries, Establishment, Project Management, Approvals, Land	[redacted]	[redacted]	[redacted]
Procurement, Materials	[redacted]	[redacted]	[redacted]
Pipeline construction	[redacted]	[redacted]	[redacted]
Total	**118.58**	**122.50**	**120.45**

ATTACHMENT 3: References

1. “WORM Project” – Business Case 083, AM&E ,March 2012.
2. “VENCorp Vision 2030 Update”, VENCorp 2009, Section 4.5.3 Figures 73, 74

   http://www.aemo.com.au/planning/v400-0003.pdf
3. NPV analysis spreadsheet.