Business Case – Capital Expenditure (Capex)

Warragul Looping

Service Provider: APA VTS Australia (Operations) Pty Limited
Asset: Victorian Transmission System (VTS) (i.e. APA GasNet System as defined under the Service Envelope Agreement (SEA))
Business Case: Number 501

1 Project Approvals

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

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Reviewed By	Sheila Krishnan, *Manager Asset Capacity Planning, APA Group*
Approved By	Mark Fothergill, *General Manager Infrastructure Strategy and Engineering, APA Group*

2 Project Overview

TABLE 2: BUSINESS CASE – PROJECT OVERVIEW

Description of Issue/Project	The Warragul lateral is connected to the Lurgi pipeline operating at pressure of 2760 kPa and is located approximately 67 km east of the Dandenong City Gate (refer location in Attachment 1). The Warragul lateral supplies a distribution network of residential and industrial customers. With the forecasted peak load increases, Warragul lateral will have to be augmented to meet gas demands by winter 2020. Approximately 4.8 km of 150 mm diameter pipeline, MAOP 2760 kPa, looping the existing lateral to Warragul, would increase the capacity of the branch, hence providing the capacity for long term growth to Warragul.
Options Considered	The following options have been considered: 1. Option 1: Do Nothing 2. Option 2: Looping the existing Warragul lateral pipeline (Preferred Solution) 3. Option 3: Installation of a new/second custody transfer meter (CTM) to the Warragul distribution with a pipeline extension from the Longford-Dandenong pipeline 4. Option 4: Installation of a small compressor on the Warragul lateral
Proposed Solution	The Preferred Solution is Option 2.
Estimated Cost	**$7.4 million (real $2016).**
Consistency with the National Gas Rules (NGR)	APA considers that the Warragul looping project meets the criteria of Rule 79(2)(c)(i), (ii) and (iv), as it is required to maintain the service provider's capacity to meet growing levels of uncontrollable demand in the interconnected distribution system. A 4.8 km of 150 mm pipeline looping the existing lateral to Warragul is the most efficient and prudent investment to augment the capacity of the lateral, and is recommended to be constructed and in service by winter 2020. Consistent with the requirements of Rule 79 of the National Gas Rules, APA considers that the capital expenditure is 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 (Rule 79(1)(a)).
Stakeholder Engagement	APA has had regular engagement with stakeholders related to this project for a number of years. The stakeholders effected by this project are: • Australian Energy Market Operator (AEMO) • Australian Gas Networks (AGN)

3 Background

To present a project recommendation and justification for the APA VTS System for the Warragul lateral looping augmentation.

The Warragul lateral is connected to the Lurgi pipeline operating at pressure of 2760 kPa and is located approximately 67 km east of the Dandenong City Gate (refer location in Attachment 1). The Warragul lateral supplies a distribution network of residential and industrial customers. The distribution network is owned by Australian Gas Networks (AGN).

APA VTS has received the updated growth forecast for the Warragul City Gate from AGN which shows demand increases over the next 15 years (refer Attachment 2). The increases are mainly contributed by the industrial customers within the network.

With the forecast load increases (and taking into account current temporary measures discussed further below), the Warragul lateral will need to be augmented to meet gas demands by winter 2020 (refer Attachment 2). Without augmentation, the Warragul City Gate would breach the required minimum connection pressure of 1400 kPa at the custody transfer meter (reference: APA Connection Agreement).

The risk of not augmenting the Warragul lateral would be to the supply reliability of the customers supplied from the City Gate, particularly those at the terminal/end points of the distribution network. Outages on the network incur high operating cost to relight customer pilot lights on water heaters as well as the safety concerns of air ingress into the distribution increasing the risk of gas explosion resulting in potential injuries and fatalities.

On the morning of 22 July 2014, the minimum pressure at 8am on the Warragul lateral reached 1287 kPa. Following this breach in delivery pressure, APA immediately implemented a number of temporary modifications to the network by increasing the Morwell Backup regulator setting to its maximum of 2760 kPa (which has the negative affect of reducing the Longford to Melbourne Pipeline declared capacity) and to temporarily reduce the required minimum connection pressure at Warragul from 1400 kPa to 1150 kPa at the custody transfer meter, as agreed with AGN.

With these implemented changes, the Warragul Looping (150mm and Southern route) could be deferred for a period, however it would be required to be in service by winter 2020 (refer Attachment 2). Following the Warragul Looping, the minimum connection pressure of 1400 kPa will be reinstated. Looping in 150mm for the Southern route can accommodate growth (extrapolated) for an approximate period of 40+ years (versus looping in 100mm which can only accommodate approximately 15 years of growth).

4 Risk Assessment

The Warragul looping project involves increasing the capacity of the transmission system to meet growing (uncontrollable) demand in the connected distribution system. In this respect, the project is not discretionary, and failure to complete the project before the distribution system demand meets anticipated levels would lead to breaches of minimum connection pressures and thus risk supply outages on the distribution system.

An unplanned loss of supply (or interruption) to a customer in any circumstance is regarded by the ESV as a potentially dangerous and undesirable event. "*Unless gas supply to a customer is safely isolated and reinstated after an interruption, there is always the possibility of gas escapes at those few appliances which have had their supply interrupted and which do not have flame failure devices fitted*"[1]. According to Energy Safe Victoria this is a circumstance which presents a risk to public safety and must be avoided.

The National Gas Rules lists the following justifiable methods for Capital Expenditure[2];

[1] Energy Safe Victoria 2009, Upstream Natural Gas Safety Report periods 1998 to 2008: Transmission and Distribution, p 10

[2] NGR 79 New capital expenditure criteria

i. to maintain and improve the safety of services; or

ii. to maintain the integrity of services; or

iii. to comply with a 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).

As the Gas Industry Act and the Gas Safety Act (Part 2 (ESV), Section 9, "Objectives of ESV under this Act are (a) to ensure the safety of the conveyance, sale, supply, measurement, control and use of gas; …" and Part 3 (Gas Safety), Section 32 "General duties of gas companies. A gas company must manage and operate each of its facilities to minimise as far as practicable—…(c) the hazards and risks to the safety of the public and customers arising from— (i) interruptions to the conveyance or supply of gas; and (ii) the reinstatement of an interrupted gas supply.") imposes obligations on network operators and owners that relate to the continuity of gas supply, APA VTS considers that all points therefore justify capital expenditure required to ensure gas supply to customers at Warragul are maintained.

Construction costs. Proposed project is of routine nature to APA VTS. The risk is mainly related to factors that are outside APA VTS control, particularly in urban environments where placement of pipeline underground may be constrained by other utilities, and controlling parties.

Technical. All construction work would be completed by technically proven contractors, to the APA VTS's engineering design and specifications. All construction processes are overseen by APA VTS.

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

Regulatory. This investment should be regarded as complying with Rule 79(2((c)(i), (ii) and (iv), and therefore is conforming capital expenditure.

5 Options Considered

Several options were considered, which include:

1.1 Option 1 – Do Nothing

- No capital expenditure is required. The Warragul City Gate would be in breach of the minimum pressure requirement of 1400 kPa, hence affecting the safe and reliable supply of the Warragul distribution network.

- The Morwell backup regulator set pressure, which was previously set to 1800 kPa, could and was raised to avoid breaching the minimum pressure obligation at Warragul. However, this reduces the overall transportation capacity of the Longford-Dandenong pipeline. Reducing the capacity of the main transmission pipeline to Melbourne due to a capacity constraint on a lateral is not an optimal solution. Further, forecast increases in demand in the Warragul network mean that this option would not deliver necessary pressures from 2020.

- This is not a technically acceptable solution.

1.1.1 Cost/Benefit Analysis

- The benefits of the Do Nothing option are the deferred capital expenditure.

- The cost of the Do Nothing option is to accept a system capacity shortfall and hence affecting the safe and reliable supply of the Warragul distribution network and reduce the overall transportation capacity of the Longford-Dandenong pipeline.

1.2 Option 2 – Looping the existing Warragul lateral pipeline

- Approximately 4.8 km of 150 mm diameter pipeline, MAOP 2760 kPa, looping the existing lateral to Warragul, would increase the capacity of the branch to 28,000 scmh, hence providing the capacity for long term growth to Warragul.

1.2.1 Cost/Benefit Analysis

- A 100 mm diameter pipeline loop would provide approximately 15,200 scmh, approximately 12,800 scmh less capacity than a 150 mm pipe diameter. Considering the small incremental difference in cost between a 100 mm and 150 mm pipeline (approximately $0.4m), and avoiding the chance of further augmenting the pipeline again, a 150 mm pipeline is recommended.

1.3 Option 3 – Installation of a new/second custody transfer meter (CTM) to the Warragul distribution with a pipeline extension from the Longford-Dandenong pipeline

- Approximately 5 km of 150 mm pipeline operating at MAOP 6890 kPa, would be laid from the Longford-Dandenong pipeline. This option would provide long term capacity for growth to the Warragul network as well as security of supply (by providing a second connection point). However, connecting a pipe from the Longford-Dandenong pipeline to Warragul would be more costly because the project would also require longer pipe and also the installation and continuing maintenance of a new meter, regulator and heater at the new city gate, which would be an additional cost to the distribution network owner.

- This solution would also have the effect of reducing the overall transportation capacity of the Longford-Dandenong pipeline.

- This is not a technically acceptable solution.

1.4 Option 4 – Installation of a small compressor on the Warragul lateral

- A 100 kW compressor would boost pressures at the Warragul offtake to ensure the delivery point would be above the minimum 1400 kPa. This option is more expensive in both capital and operating/maintenance costs than the duplication of the Warragul branch. The compressor provides Warragul with short term capacity. It would increase the capacity of the Warragul lateral to approximately 11,200 scmh and would require further augmentation by winter 2029 to meet the load forecast.

- This is not a technically acceptable or prudent solution

1.5 Summary of Cost/Benefit Analysis

The preferred solution is Option 2 which involves the looping of the existing Warragul lateral with 150 mm pipe. This augmentation is considered the most cost effective solution to augment the capacity of the Warragul lateral and would be required to be in service by winter 2020.

TABLE 4: SUMMARY OF COST/BENEFIT ANALYSIS

Option	Benefits (Risk Reduction)	Costs ($2016)
Option 1 (Do Nothing)	Nil.	Reduced capacity on the Longford – Melbourne pipeline.

Option 2 (Warragul 150 mm Loop)	Preferred Solution. Provides long term capacity to the Warragul lateral.	$7.4 million
Option 2b (Warragul 100 mm Loop)	Provides medium term capacity to the Warragul lateral	$7.0 million
Option 3 (Mains Extension)	Provides long term capacity to the Warragul lateral and a second delivery point to the Warragul distribution system.	$8.7 million (which includes $2.6 m of additional project costs for a new city gate, meter, regulator and water bath heater which would be a cost to the network owner, plus annual operating costs for the new facilities).
Option 4 (100 kW Compressor)	Provides short term capacity to the Warragul lateral	$13.4 m + additional operating and maintenance costs.

Operating Cost – Option 2

Annual expenditure to operate and maintain the pipeline has been estimated to be $20 400 per annum. This operating expenditure increase is estimated as incremental expenditure to the base opex and will form a scope change to the APA VTS opex forecast.

1.5.1 Consistency with the National Gas Rules

Rule 79(2)

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 considers that the above presented capital project meets the criteria of Rule 79(2)(c)(i), (ii) and (iv).

A 4.8 km of 150 mm pipeline looping the existing lateral to Warragul is the most efficient and prudent investment to augment the capacity of the lateral, and is recommended to be constructed and in service by winter 2020.

1.5.2 Forecast Cost Breakdown

The capital and operating costs for Option 2 is detailed in the Table below in 2016 dollars.

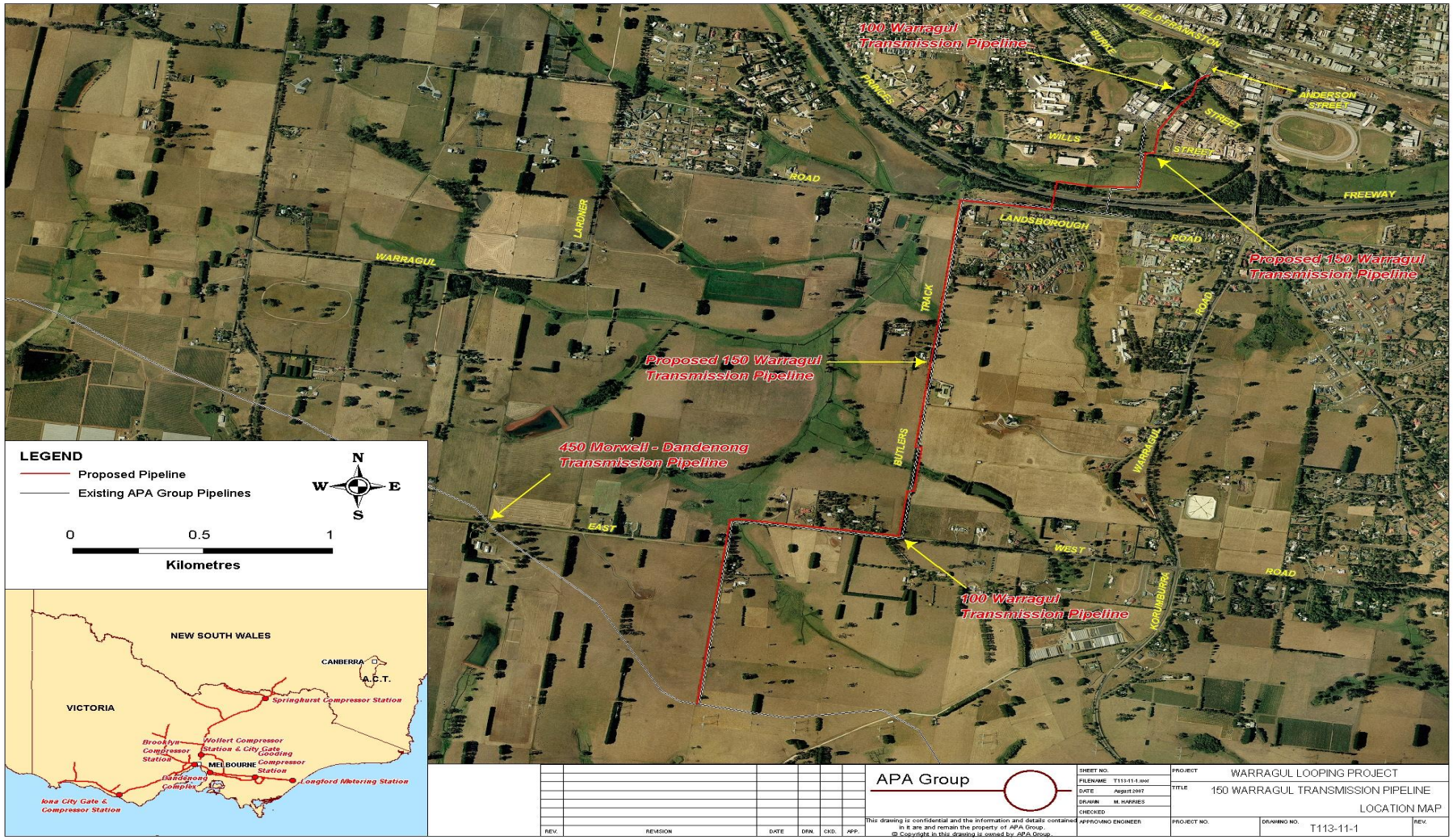
TABLE 5.1: CAPEX/OPEX SPLIT

	2018	2019	2020	2021	2022	Total
Capex		$5.4 m	$2.0 m			**$7.4 m**
Opex				$20.4 k/yr.	$20.4 k/yr.	**$20.4 k/yr.**
Total		**$5.5 m**	**$2.1 m**	**$20.4 k/yr.**	**$20.4 k/yr.**	

TABLE 5.2: PROJECT COST ESTIMATE, BY COST

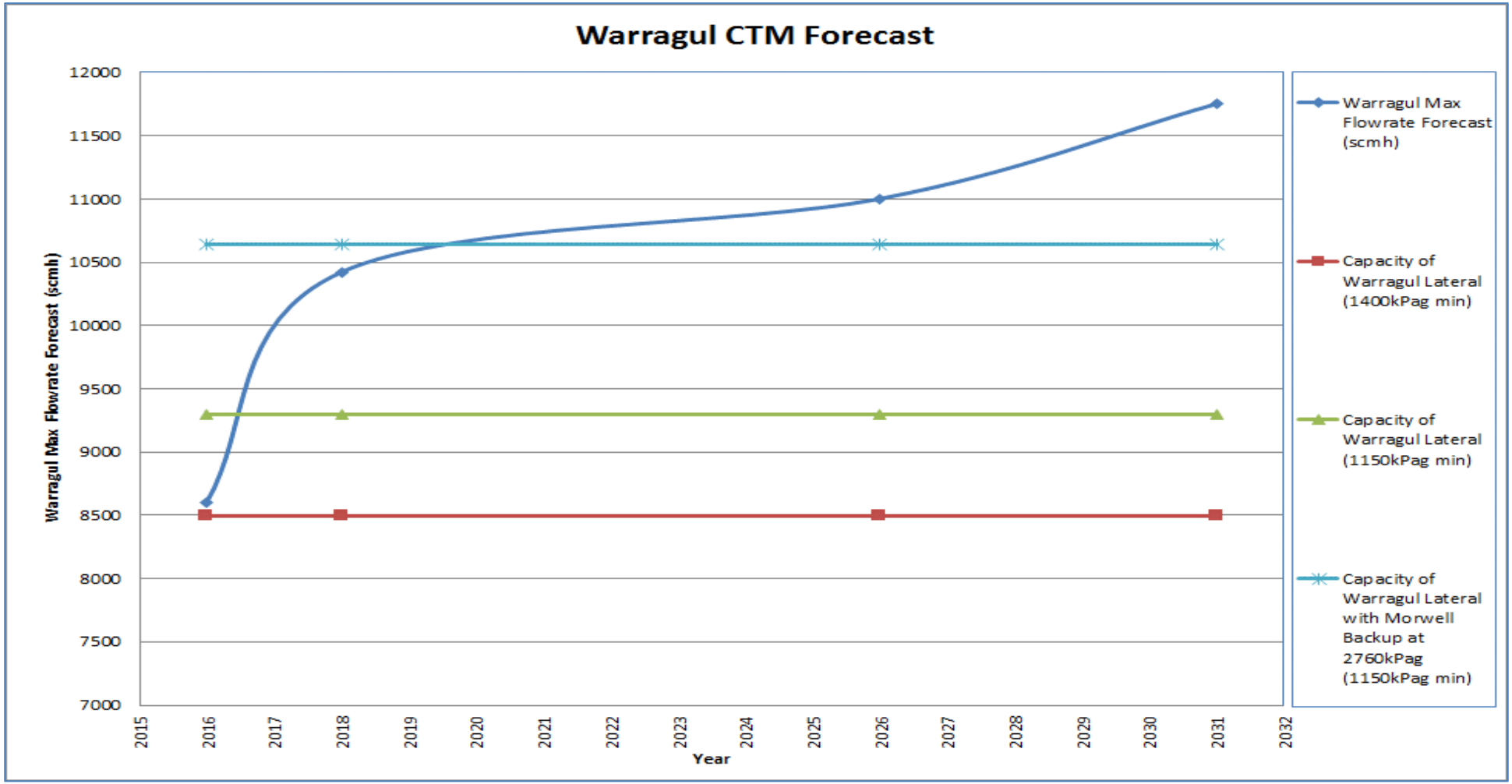
	2018	2019	2020	2021	2022	Total
Project Management, Design, Commissioning		$0.9 m	$0.3 m			**$1.2 m**
Land & Approvals		$1.4 m				**$1.4 m**
Procurement		$0.5 m				**$0.5 m**
Construction		$2.6 m	$1.7 m			**$4.3 m**
Total		**$5.4 m**	**$2.0 m**			**$7.4 m**

Attachment 1 – Location of the Warragul Looping



Attachment 2 – Demand Forecast Warragul CTM

Graph showing timing of Warragul augmentation based on the latest load forecast. Information source: "Gas Forecast CTM.xlsx", APA Networks communications 20th January 2016.



Attachment 3 – References

1. “Gas Forecast CTM.xlsx”, APA Networks communications 20th January 2016.