AusNet

Gas Network

Network Planning Report – Werribee

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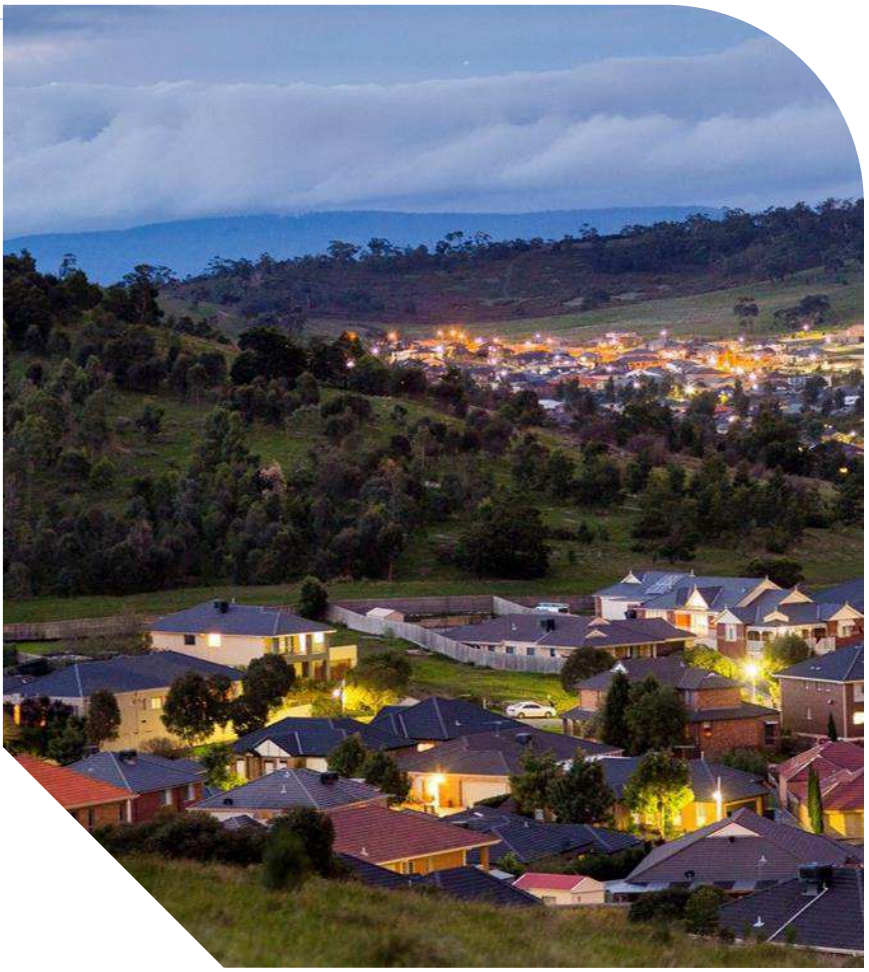

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AusNet Services
Level 31, 2 Southbank Boulevard
Melbourne Victoria 3006
Ph: (03) 9695 6000

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Executive Summary

The High Pressure (HP1) network Werribee network will be unable to support projected gas consumption growth and would require a network reinforcement by FY2027/28 to boost network capacity in affected areas to maintain adequate minimum network pressure and complying with Gas distribution code.

Recommendation - FY27/28

- Construction of a new proposed City Gate on Bulban Road in Werribee
- Construction of [C.I.C] of 180mm polyethylene pipe to supply existing network

1. Network Overview

The Werribee gas networks are parts of AusNet Services' metropolitan High Pressure (HP1) network located in the South West region. These networks are currently being supplied by a series of field regulators part of the Hoppers Crossing, Tarneit, and Point Cook areas, with the closest city gates at "Wyndham Vale" and "Lock Ave" city gates regulators.

The western Growth Corridor of Werribee has and is continuing to experience considerable development and exponential residential connections. These significant growths are also continuing to expand away from existing supporting city gates resulting in supply pressure deterioration experienced in recent years.

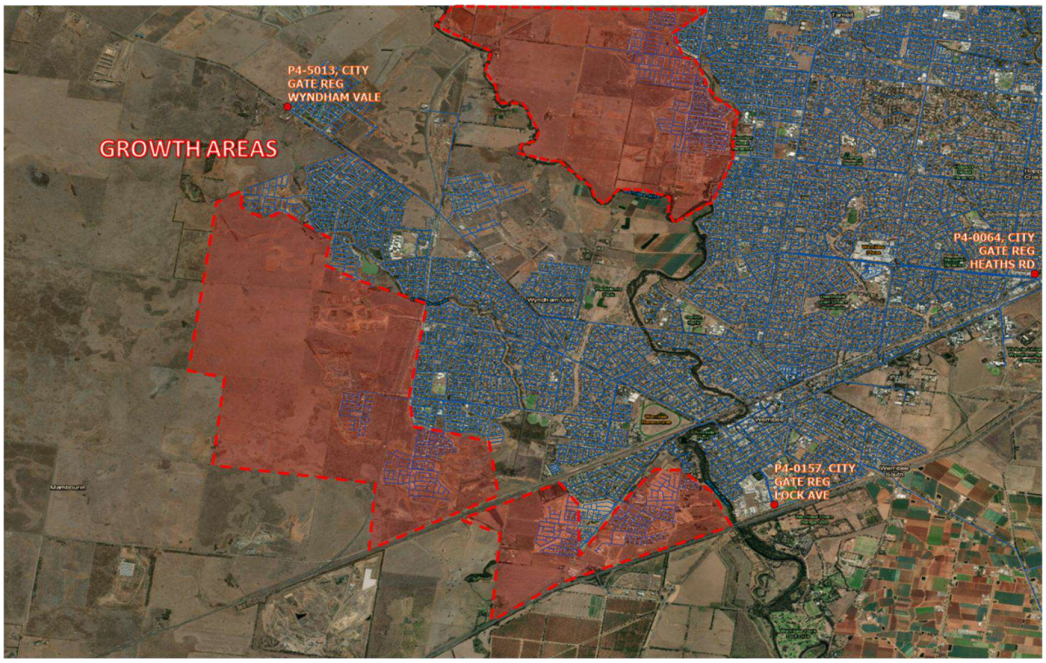


Figure 1: Werribee gas distribution network overview

2. Network Performance

The continued strong residential growth and expansions in the western Growth Corridor of Werribee has been causing declining supply pressures in the Werribee network. Increasing low network pressures events in recent years with the continued fringe expansions have been consuming more capacity in the network, resulting in pressures to be on a steady decline.

The chart below details the instances of lowest network pressure instance experienced in each year of the Werribee areas as of August 2020.

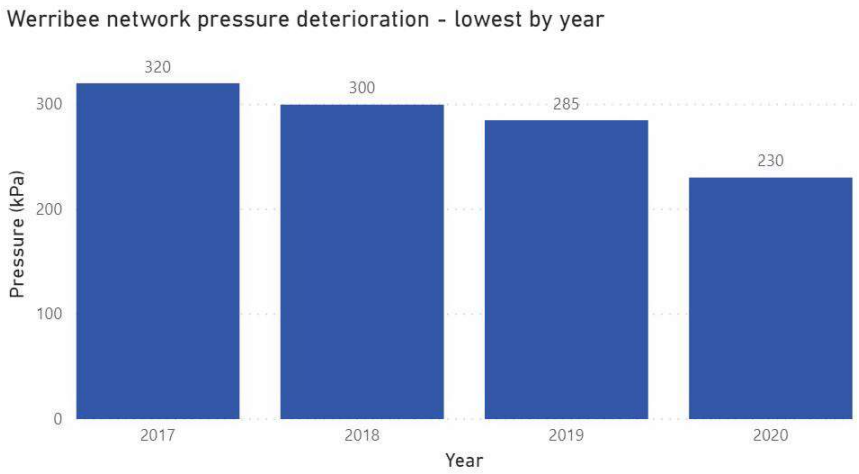


Figure 2: Werribee Network Performance Issues

The lowest pressure instances per year shown above demonstrate the increasing rate of pressure deterioration in the network due to strong growth and expansions in the Werribee network. The rate of deterioration is shown in the chart to be at approximately decreasing at a rate of 23kPa per year on average. Consequently, poor network performance is forecasted from the constraints in capacity for the Werribee network with the strong projected growth in the area.

The capacity constraints in the Werribee networks are driven by:

- Continuous strong growth in the South Western corridor in the Werribee network
- Rapid expansions of network fringes away from supply City Gate sources

3. Network Modelling

Network model for the Werribee High Pressure network is matched with latest analysis of the network using SCADA monitoring, fringe pressures in 2020.

The matched model illustrates the affected areas at the South Western section fringes as shown below.

Figure 3: Werribee matched model - winter 2020

Growth Forecasts rates provided by Economic Regulation in AusNet Services' Regulation & Network Strategy department for the Werribee are as shown in table below.

Table 1: Werribee Growth Rate Forecast

Postcode	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
3030	3.20%	2.98%	3.02%	3.00%	3.03%	3.03%	3.03%
3029	3.98%	1.58%	1.56%	1.59%	1.55%	1.55%	1.55%
3024	3.48%	3.33%	3.29%	3.26%	3.29%	3.29%	3.29%

Modelling the growth forecast rates above, the forecast minimum network pressures and estimated number of customer impact for the regulatory period can be obtained and detailed below:

Table 2: Werribee forecasted minimum pressure and customer impact

Werribee	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
Minimum pressure (kPa)	231	210	183	155	129	Reinforcement required
Customer impact (no,)	0	0	0	0	1,200	-

4. Recommendations

4.1. Options considered

Several options were considered to increase the Werribee network capacity, which include

Table 3: Options Description Summary

OPTION	DESCRIPTION SUMMARY
1	No Capital Expenditure
2	Bulban Road City Gate network reinforcement
3	Ballan Road Looping reinforcement

4.2. Option 1 – Do Nothing / No Capital expenditure

The Werribee network is supplied by a series of field regulators part of the Hoppers Crossing, Tarneit, and Point Cook areas. During peak conditions, these regulators can be raised further from 470kPa to 500kPa to push more gas through to the fringes of the network.

The consequence of accepting this option is that any regulator operating pressure at or above the 450kPa threshold accelerates the wear of the regulator components. It is therefore not recommended from a safety and engineering standard perspective to operate the regulator at or above 450kPa for an extended period of time.

This option is not acceptable based on safety and engineering concerns.

4.2.1. Cost Estimations

Raise series of field regulators part of the Hoppers Crossing, Tarneit, and Point Cook areas, with the closest city gates namely "Wyndham Vale" and "Lock Ave" city gates regulators outlet pressure to 500 kPa

- The cost of the non-capital expenditure option is to accept safety risk from regulator failures due to the acceleration of deterioration of the regulator components.

Total capital expenditure = $0

4.2.2. Capacity

The benefits of the non-capital expenditure option are the deferred capital expenditure.

4.3. Option 2 – Bulban Road City Gate reinforcements

Due to the continuous expansion of network from the strong Western growth corridor in Werribee away from existing supply sources, the Werribee fringe network has been experiencing steady decline in supply pressure and forecasted to experience shortfall in capacity. The construction of a City Gate in the South - Western boundary of the current growth corridor would significantly boost capacity in the Werribee network and provide long-term capacity solution to service the continued strong network expansion.

Network Reinforcement work comprises of:

1. Construction of a new proposed City Gate near Bulban Rd and Ball Rd intersection in Manor.
2. Construction of approximately [C.I.C] of 180mm polyethylene pipe to supply existing network along Bulban Rd and tie-in to 180mm polyethylene pipe at Bulban Rd.

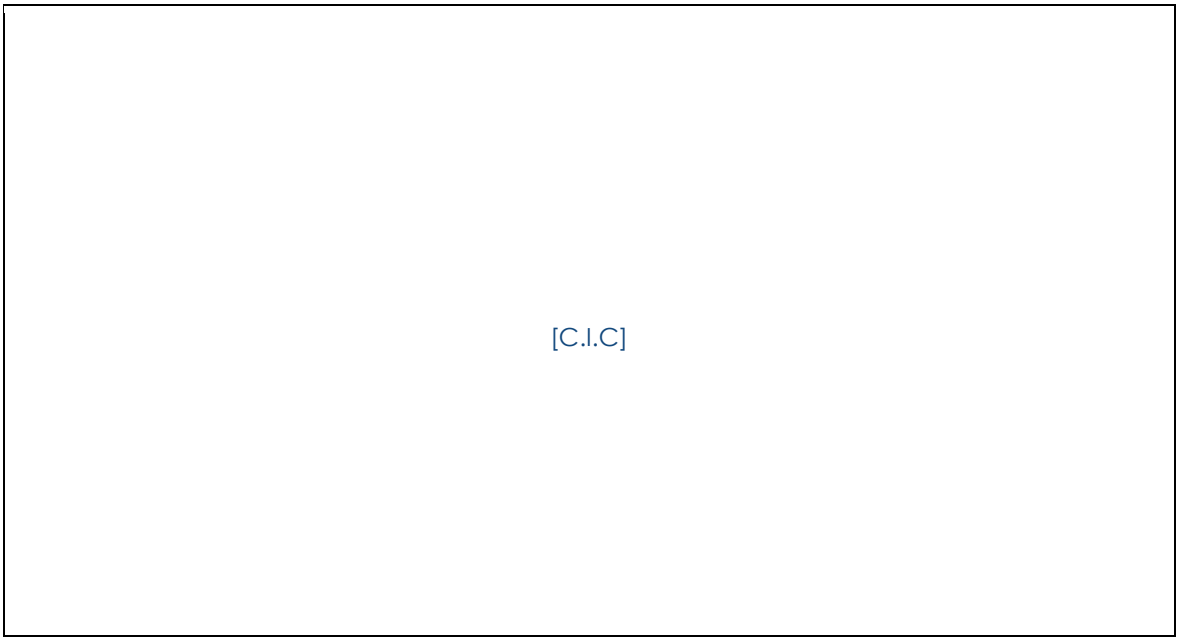


Figure 4: Werribee Reinforcement - Option 2

4.3.1. Cost Estimations

[C.I.C]

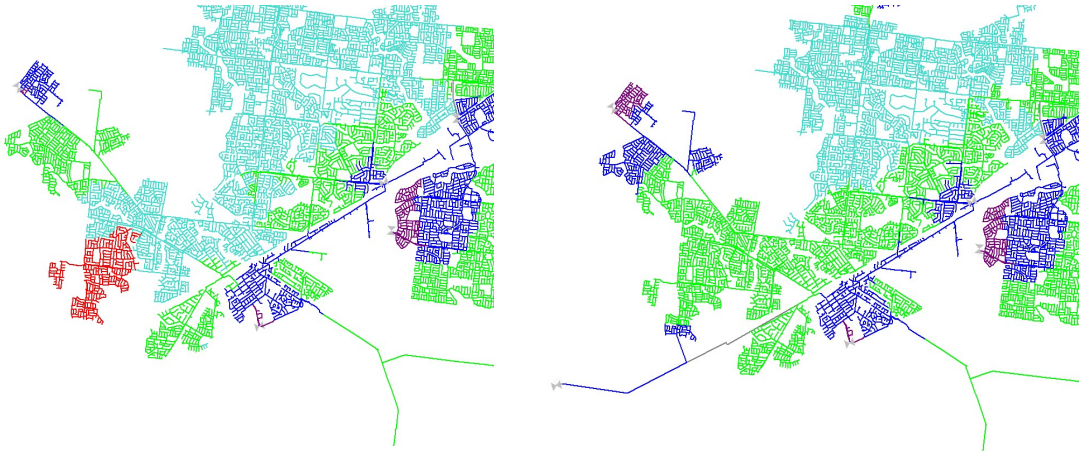
4.3.2. Capacity

Table 4: Option 2 - Werribee Identified Network Reinforcement

2027 Forecast Minimum Pressure	Affected Customers	REINFORCEMENT SUMMARY	Post Reinforcement Minimum Pressure
124kPa	4,000	New City Gate and [C.I.C] of 180P10	248kPa

Table 5: Werribee Forecast Minimum Network Pressures

2023/24	2024/25	2025/26	2026/27	2027/28
210kPa	183kPa	155kPa	129kPa	210kPa



2027/28 Before Facility Installation **2027/28 After Facility Installation**

Figure 5: Werribee before and after augmentation

4.4. Option 3 – Ballan Road Looping reinforcement

This option proposes to reinforce existing network by looping critical backbone supply mains from nearby existing supply source of "Wyndham Vale City Gate" to boost capacity towards the growth corridor. The looping reinforcement would boost capacity up to the South Western fringes of the growth to address the estimated capacity constraints in the area.

Network Reinforcement work comprises of:

1. Construct approximately [C.I.C] of 180mm polyethylene along Ballan Road and Tie-in to the existing 180mm poly mains at Ballan Rd and Ison Rd intersection.

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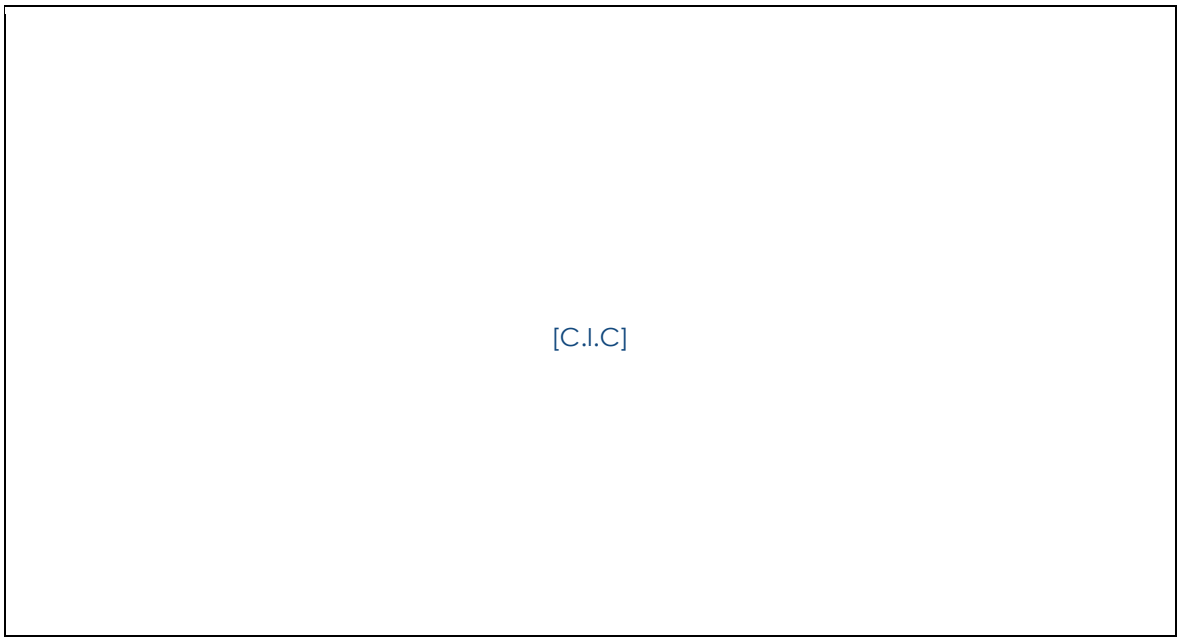


Figure 6: Werribee Reinforcement - Option 3

4.4.1. Cost and benefit analysis

[C.I.C]

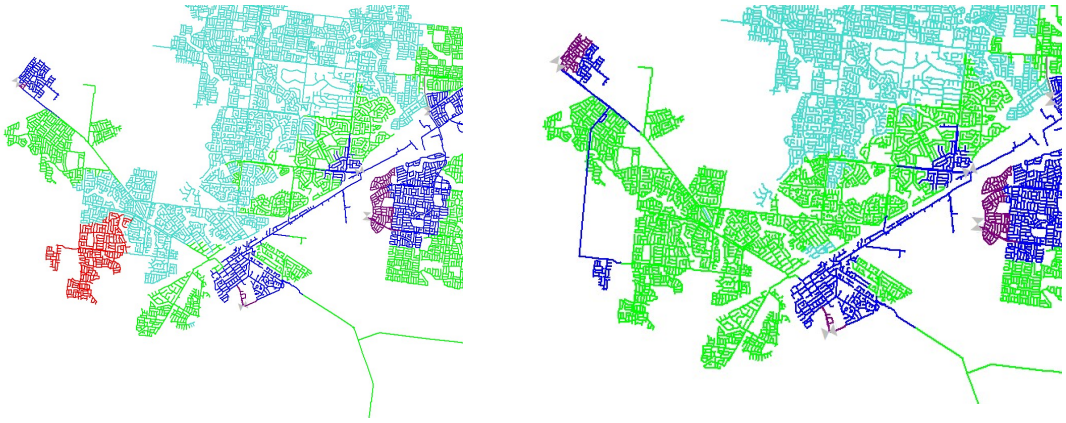
4.4.2. Capacity

Table 6: Option 3 - Werribee Identified Network Reinforcement

2027 Forecast Minimum Pressure	Affected Customers	REINFORCEMENT SUMMARY	Post Reinforcement Minimum Pressure
124kPa	4,000	[C.I.C] of 180mm P10	190kPa

Table 7: Werribee Forecast Minimum Network Pressures

2023/24	2024/25	2025/26	2026/27	2027/28
210kPa	183kPa	155kPa	129kPa	254kPa



2027/28 Before Facility Installation **2027/28 After Facility Installation**

Figure 8: Werribee before and after augmentation

4.5. Benefit Assessment

The preferred solution is Option 2 which involves the construction of a new City Gate including a [C.I.C] distribution pipeline along Bulban Rd, Werribee. This augmentation is considered the most cost-effective solution to provide long term capacity solution for the fast-growing Werribee network.

Table 8: Options Assessment Summary

OPTION	BENEFITS	COSTS ($2020)
Option 1	Nil.	Continue accepting Werribee capacity shortfall and further network pressure deterioration and compromised safety and reliability of existing network.
Option 2	Preferred solution – this option will provide long term security of supply and will cater for all future growth in the Western Werribee area.	[C.I.C]
Option 3	This option will provide additional capacity required for the projected growth at a lower cost compared to Option 2. However, due to continue strong growth expected, further reinforcement may be required in the following regulatory period to maintain adequate supply for the growth corridor. This option is not a preferred solution.	[C.I.C]

5. Capital expenditure summary

Table 9: Capital Expenditure Summary

	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2024-28 TOTAL
			[C.I.C]				

AusNet Services

Level 31
2 Southbank Boulevard
Southbank VIC 3006
T +613 9695 6000
F +613 9695 6666
Locked Bag 14051 Melbourne City Mail Centre Melbourne VIC 8001
www.AusNetservices.com.au

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