AusNet

Gas Network

Network Planning Report – Tarneit
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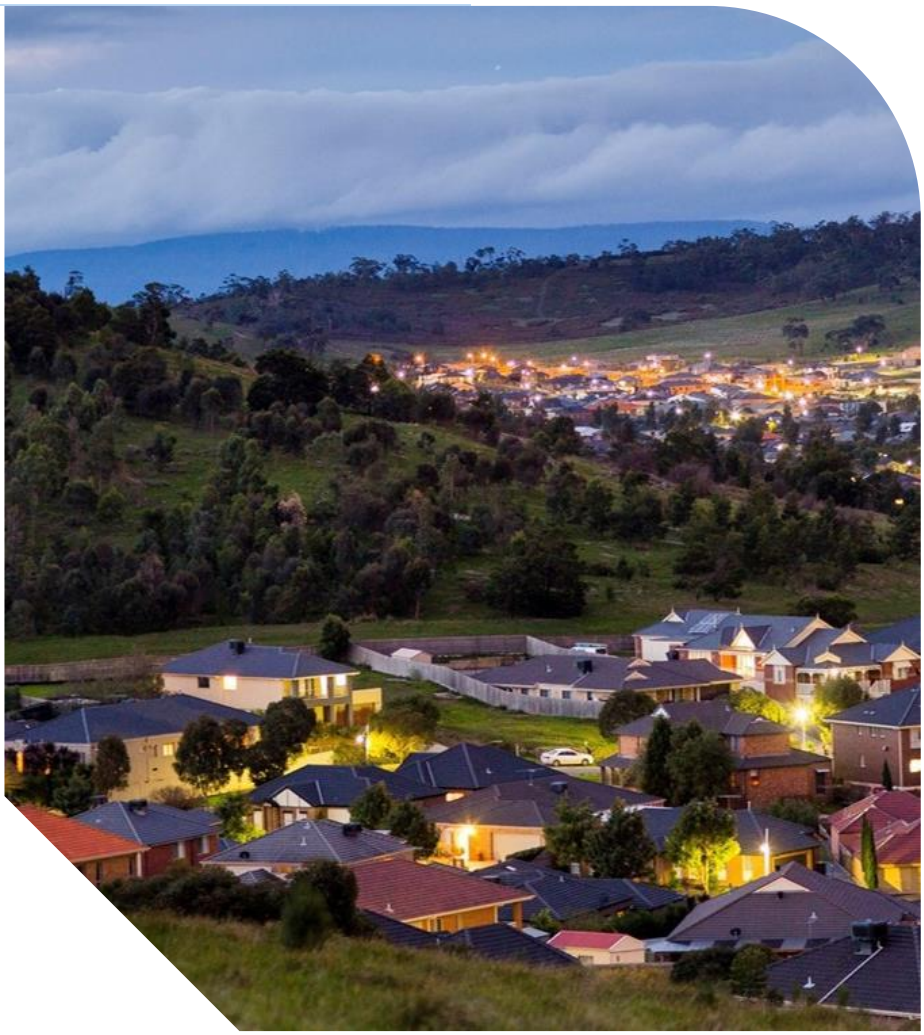

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Executive Summary

The Tarneit gas networks will be unable to support the continued strong gas consumption growth at the Werribee Western growth corridor and would require a network reinforcement by FY2024/25 to increase network capacity required for affected areas to maintain adequate minimum network pressure and complying with Gas distribution code.

Recommendation - FY24/25

Construction of [C.I.C] of 180mm polyethylene pipe from Mt Cottrell City Gate outlet along Tarneit Road to tie-in to existing network along Dohertys Rd, Tarneit

1. Network Overview

The Tarneit gas networks are parts of AusNet Services' metropolitan High Pressure (HP1) network located in the South-Western region. These networks are currently being supplied by a series of City Gate regulators part of the Werribee and Tarneit areas, with the closest supplying city gates at "Mt Cottrell", "Heaths Rd" and "Forsyth Rd" city gates regulators.

Tarneit is continuing to experience substantial development and expansions growing outwards from all current supply City Gate sources. This is causing significant increased supply pressure decline and low pressure events in the area.

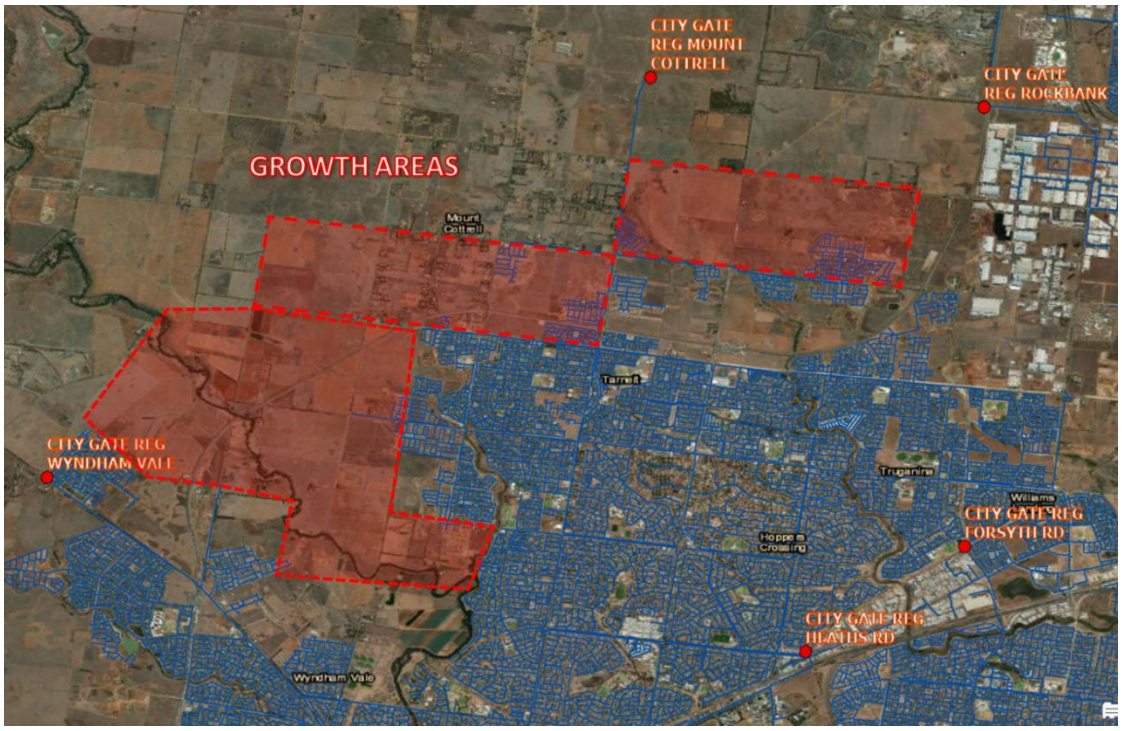


Figure 1: Tarneit gas distribution network overview

2. Network Performance

As a result of continued significant growth in the Werribee, Tarneit, and Tarneit growth areas, during winter peak demand periods, network pressures at Tarneit fringes have been experiencing continued supply pressure decline instances, dropping below gas distribution code of 140kPa minimum.

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

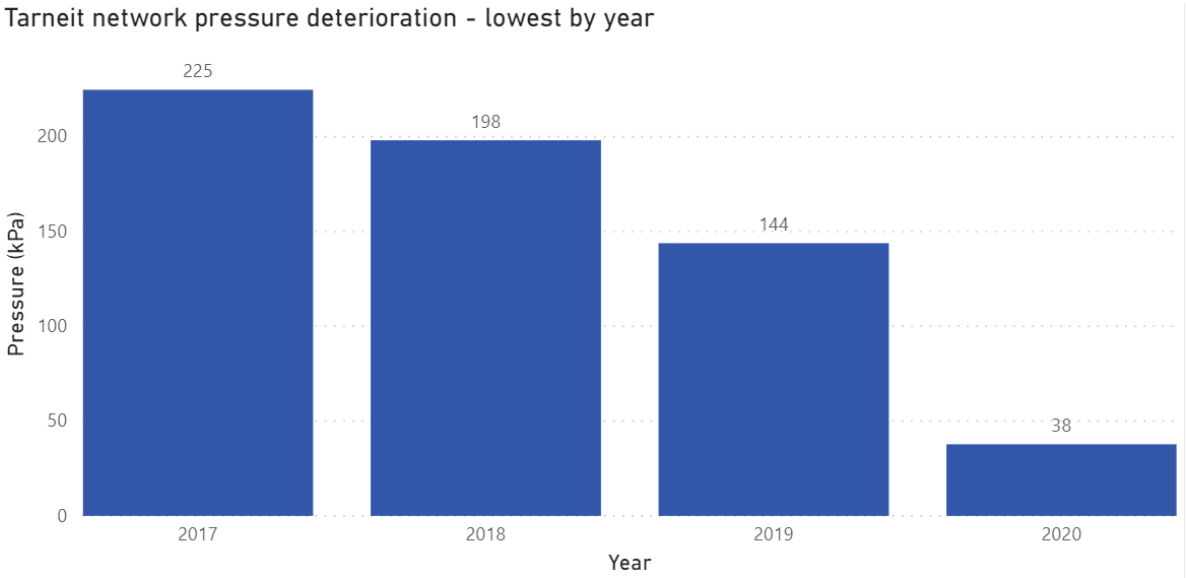


Figure 2: Tarneit Network Pressure Deterioration

The lowest 20 instances of fringe pressure are shown below.

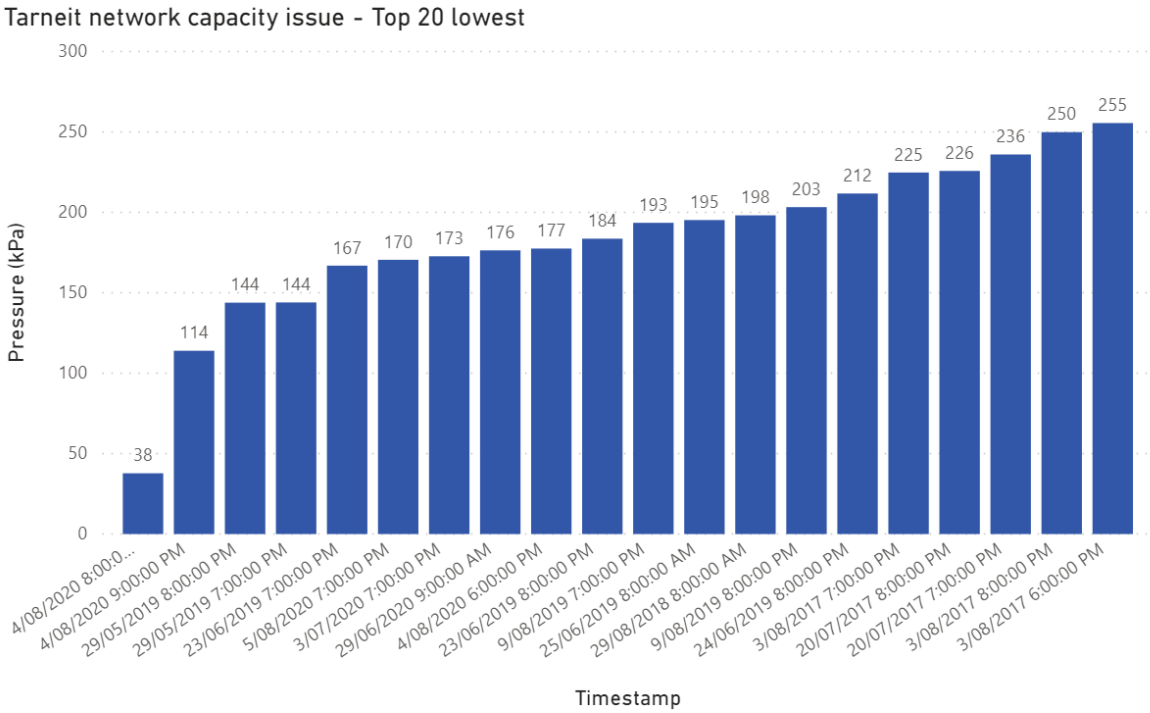


Figure 3: Tarneit Network Performance Issues

The number of low network pressure events shown above have been resulting in recurring number of customer supply affected since 2015 showing the capacity limitations in the Tarneit network.

The capacity constraints in the Tarneit networks are driven by:

- Limited backbone supply mains and small backbone mains throughout the large and growing network.
- Expanding network fringes with continued strong growth in the Truganina and Tarneit growth corridor.

3. Network Modelling

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

The matched model illustrates the areas of low network pressures in the Tarneit fringes below, showing the current limited capacity availability in most of Hoppers crossing and Tarneit areas with the Tarneit fringe area having the lowest minimum pressure point.

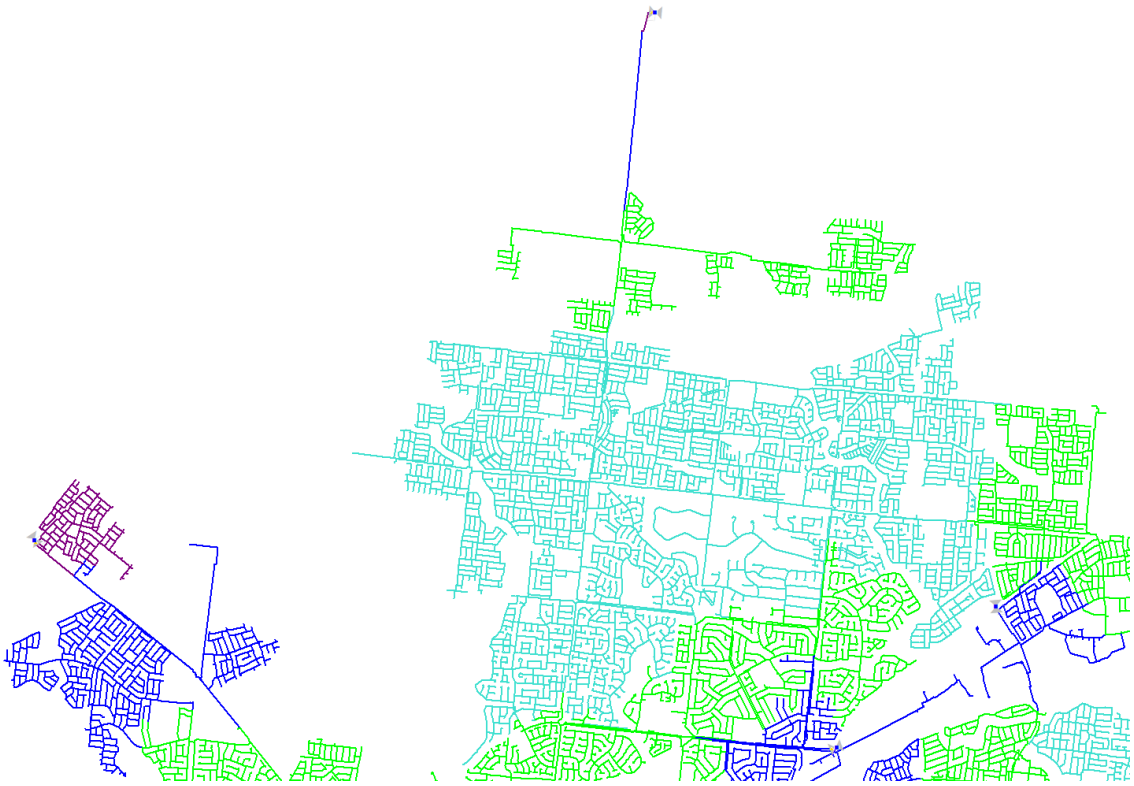


Figure 4: Tarneit model - winter 2020

Growth Forecasts rates provided Finance Data Analytics Team in AusNet Services' Finance department for the Tarneit are as shown in table below.

Table 1: Tarneit Growth Rate Forecast

Postcode	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
3029	1.58%	1.56%	1.59%	1.55%	1.55%	1.55%

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: Tarneit forecasted minimum pressure and customer impact

Tarneit	2022/23	2023/24	2024/25
Minimum pressure (kPa)	140	132	Reinforcement required
Customer impact (no.)	0	3,300	0

Based on the consumption growth forecast, the Tarneit HP1 will be unable to support projected gas consumption growth and would require a network reinforcement by FY2024/25 to boost network capacity in affected areas, hence would be maintaining adequate minimum network supply pressure.

4. Recommendations

4.1. Options considered

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

Table 3: Options Description Summary

OPTION	DESCRIPTION SUMMARY
1	No Capital Expenditure
2	Tarneit Road network reinforcement
3	Wyndham Vale City Gate network reinforcement

4.2. Option 1 – Do Nothing / No Capital expenditure

All non-capital expenditure options have been utilised to alleviate pressure issues in the Tarneit network including:

- Increase of all connected supply regulators outlet pressures to maximum allowable pressure of 510kPa during peak demand periods.
- Raising regulators outlet pressure during off-peak period to improve line pack capacity during peak.

These measures have all been unsuccessful to adequately maintain minimum pressures in the Tarneit network and increasingly poor network pressures have been occurring.

4.2.1. Cost Estimations

Raise Mt Cottrell City Gate outlet pressure to 510kPa

- 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 – Tarneit Road network reinforcements

Additional capacity can be provided by undertaking a reinforcement along Tarneit Road nearby to Mt Cottrell City Gate. A mains extension of [C.I.C] in 180mm diameter polyethylene pipe along Tarneit Road would be required to address current capacity shortfall in the Tarneit network by boosting further capacity directly from Mt Cottrell City Gate towards the impacted fringes of the Tarneit network.

Network Reinforcement work comprises of:

- Construction of [C.I.C] of 180mm polyethylene pipe from Mt Cottrell City Gate outlet along Tarneit Road to tie-in to existing 180mm polyethylene pipe at Dohertys Rd and Tarneit Rd intersection, Tarneit.

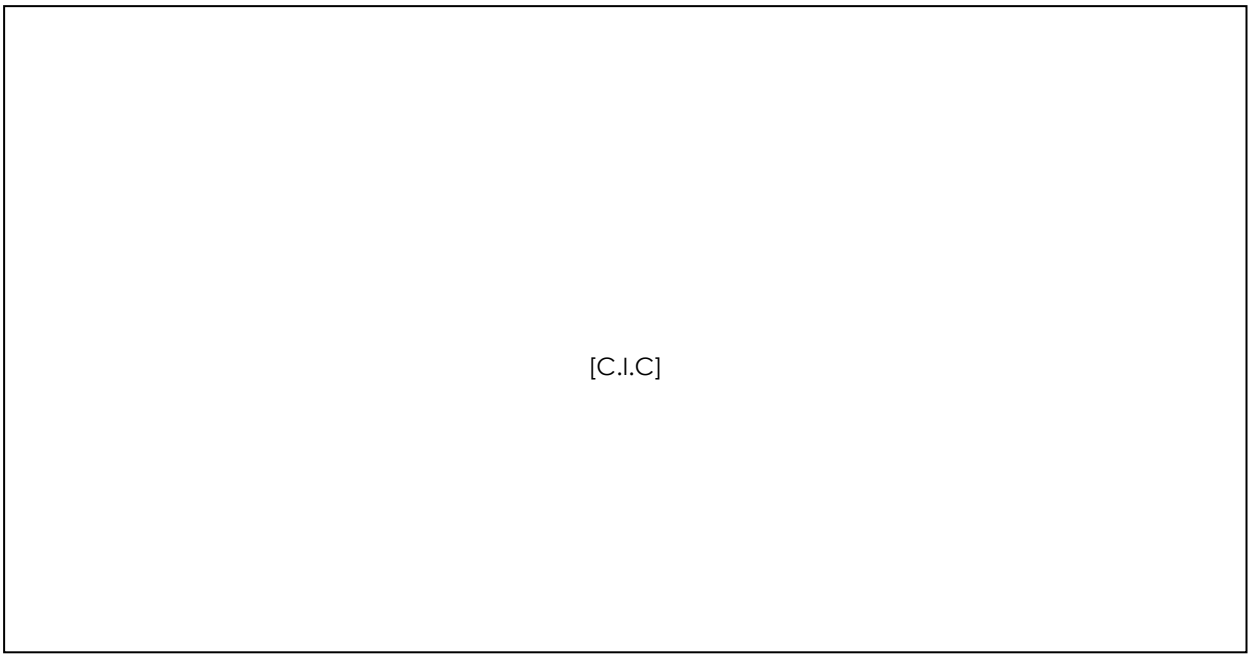


Figure 5: Tarneit Reinforcement - Option 2

4.3.1. Cost Estimations

[C.I.C]

4.3.2. Capacity

Table 4: Option 2 - Tarneit Identified Network Reinforcement

2027 Forecast Minimum Pressure	Affected Customers	REINFORCEMENT SUMMARY	Post Reinforcement Minimum Pressure
132kPa	3,300	[C.I.C] of 180mm Polyethylene pipelines	194kPa

Table 5: Tarneit Forecast Minimum Network Pressures

2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
140kPa	132kPa	191kPa	186kPa	178kPa	170kPa

2024 Before Augmentation **2024 After Augmentation**

Figure 5: Tarneit before and after augmentation

4.4. Option 3 – Wyndham Vale City Gate network reinforcement

Capacity can also be increased to the impacted Tarneit fringe area by extending large supply mains from the nearest City Gate Supply sources West of Tarneit at Wyndham Vale City Gate. Network pressure would be considerably increase by extending approximately [C.I.C] of 180mm polyethylene mains from Ballan Rd near Wyndham Vale City Gate towards Sayers Rd towards impacted Tarneit fringe crossing Werribee River and an existing railway.

Network Reinforcement work comprises of:

- Laying of [C.I.C] of 180mm polyethylene pipe from Ballan Road near Wyndham Vale City Gate to Sayers Rd

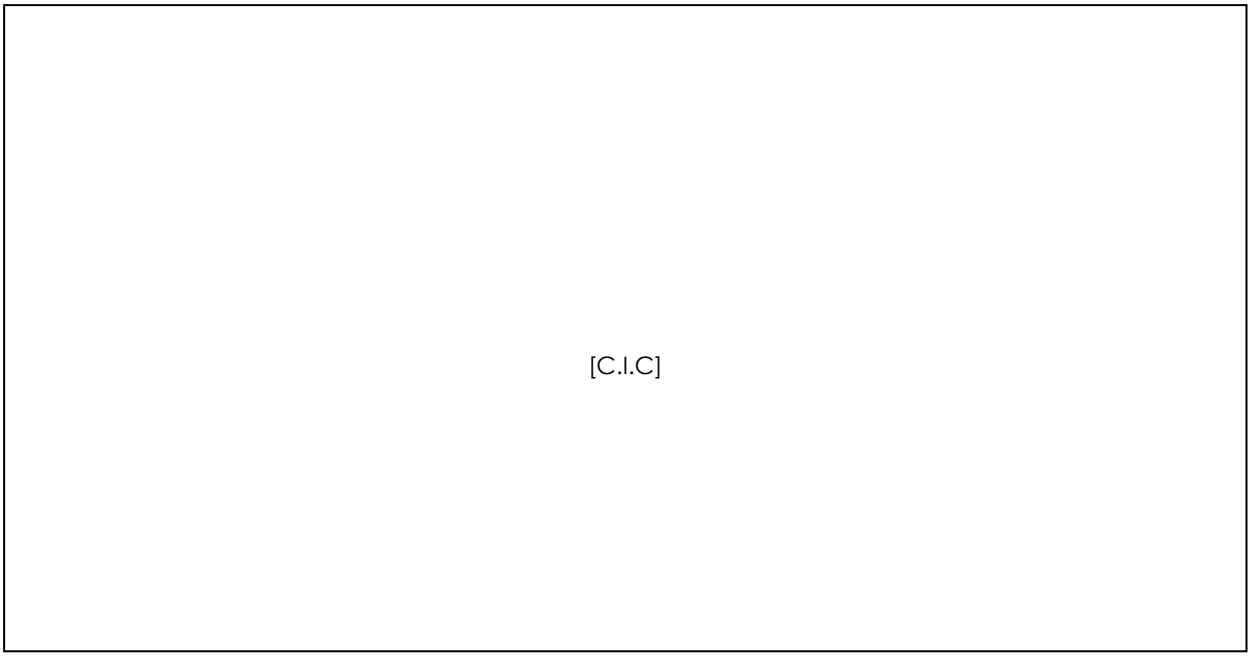


Figure 6: Tarneit Reinforcement - Option 3

4.4.1. Cost and benefit analysis

[C.I.C]

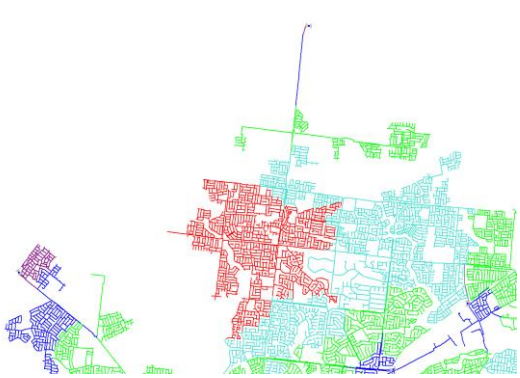
4.4.2. Capacity

Table 6: Option 3 - Tarneit Identified Network Reinforcement

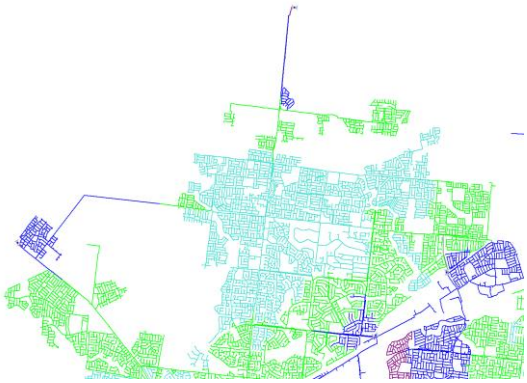
2024/25 Forecast Minimum Pressure	Affected Customers	REINFORCEMENT SUMMARY	Post Reinforcement Minimum Pressure
132kPa	3,300	[C.I.C] of 180mm poly pipeline	191kPa

Table 7: Tarneit Forecast Minimum Network Pressures

2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
140kPa	132kPa	191kPa	186kPa	178kPa	170kPa



2024 Before Augmentation



2024 After Augmentation

Figure 8: Tarneit before and after augmentation

4.5. Benefit Assessment

The preferred solution is Option 2 which involves the construction of a [C.I.C] of 180mm polyethylene pipeline from the outlet of Mount Cottrell City Gate along Tarneit Road to tie-in to existing network along Dohertys Rd, Tarneit. This augmentation is considered the most cost-effective solution to augment the capacity of the Tarneit network and would be required to be in service by FY2024/25.

Table 8: Options Assessment Summary

OPTION	BENEFITS	COSTS ($2020)
Option 1	Nil.	Continue accepting Tarneit capacity shortfall and further network pressure deterioration and compromised safety and reliability of existing network.
Option 2	Preferred solution – the most cost-effective option to address current capacity shortfall in the fast-growing Tarneit network.	[C.I.C]
Option 3	Addressing current capacity shortfall. While this proposed option addresses current capacity shortfall and provide long term solution to supply, it is a less economical option compares to option 2. Furthermore, the requirements of river crossing and railway crossing would significantly increase project complexity and additional costs. Therefore, this option 3 is not a recommended solution.	[C.I.C]

5. Capital expenditure summary

Table 9: Capital Expenditure Summary

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

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