

Technical Memo

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|-------------------------|--|----------------------|------------------|
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| Subject/Title | Water Supply & Wastewater Technical Note for CRR Roma St Precinct | | |
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| Discipline | Water & Wastewater | | |
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| Prepared for | Cross River Rail Delivery Authority | Attention to | Daniel Gallagher |
| Attachments | Attachment A Development Yield Maps & Tables Attachment B Netserv Plan Extract Attachment C Cost Estimates | | |

1 Introduction

1.1 Background

The Queensland Government's Cross River Rail Precincts Delivery Strategy (PDS) sets a vision for each Cross River Rail (CRR) Station precinct that is aligned to the Government's policy priorities. The Strategy sets out a vision for Roma Street Precinct to be an extension of the CBD and Brisbane's gateway to jobs, tourism and recreation.

To facilitate the realisation of this potential, the Roma Street precinct focus will be on:

- The key arrival destination for the central CBD, and the western gateway to the City's premier cultural, leisure and entertainment offerings including a Potential Major Entertainment Arena (PMEA).
- Improved public realm and active transport connections to improve pedestrian movement and connections.
- Significant upgrades to State-owned station interchange for CRR, Metro and bus services, including realignment of the Inner Northern Busway.

The Strategy sets out a Roma Street Precinct Intent, located at one of Brisbane's most significant city centre arrival points, having the opportunity to become a key economic and community hub through major redevelopment, reinvigorating heritage places, new public spaces and developing strong connections to nearby major parklands and facilities.

The Cross River Rail Delivery Authority Act 2016 establishes the Cross River Rail Delivery Authority (CRRDA). The purpose of the CRRDA is to plan, carry out, promote or coordinate activities to facilitate economic development and development for community purposes in a CRR Priority Development Area (PDA). The location of the Roma Street CRR PDA is shown in Figure 1.

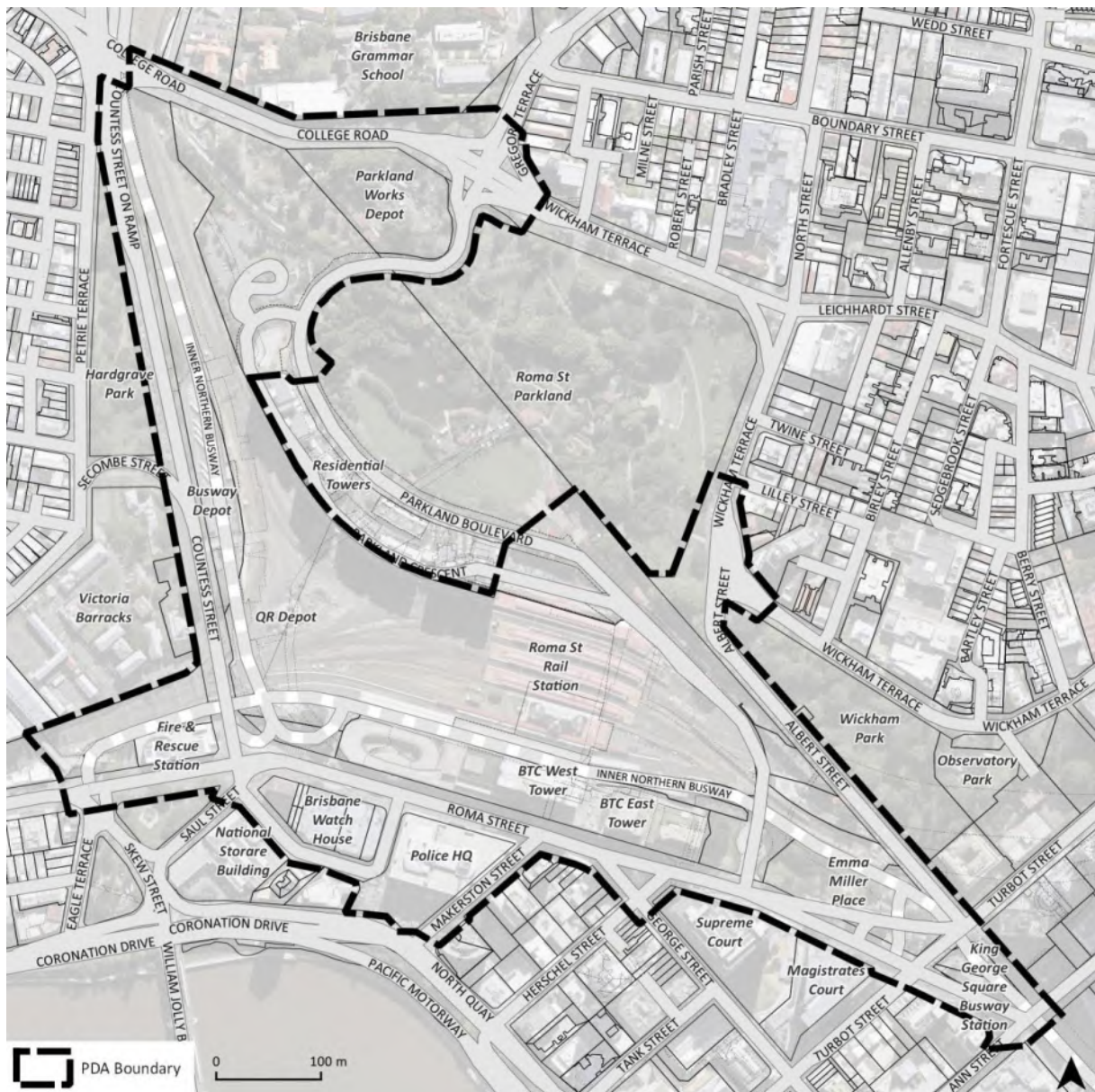


Figure 1 Map of Cross River Rail Roma St PDA Boundary

The CRRDA is preparing a Development Scheme for the Roma Street CRR PDA to support the Government's PDS Vision and to achieve the purposes of the Act.

1.2 Objective

This Technical Memo provides an assessment of the water and wastewater network infrastructure requirements to understand and address the impacts related to the Roma Street Precinct future development opportunities as part of the wider Cross River Rail (CRR) Project. The outcomes will assist in informing infrastructure plans for the PDA Development Scheme and its supporting material, including the Development Charges and Offsets Plan (DCOP).

The external water and wastewater service provider for the PDA is Urban Utilities (UU).

2 Land Use

2.1 Potential Development Opportunity Sites

Potential development opportunity sites in the PDA are shown in Figure 2 and summarised in Table 1.

Table 1 Overview of Potential Development Opportunity Sites

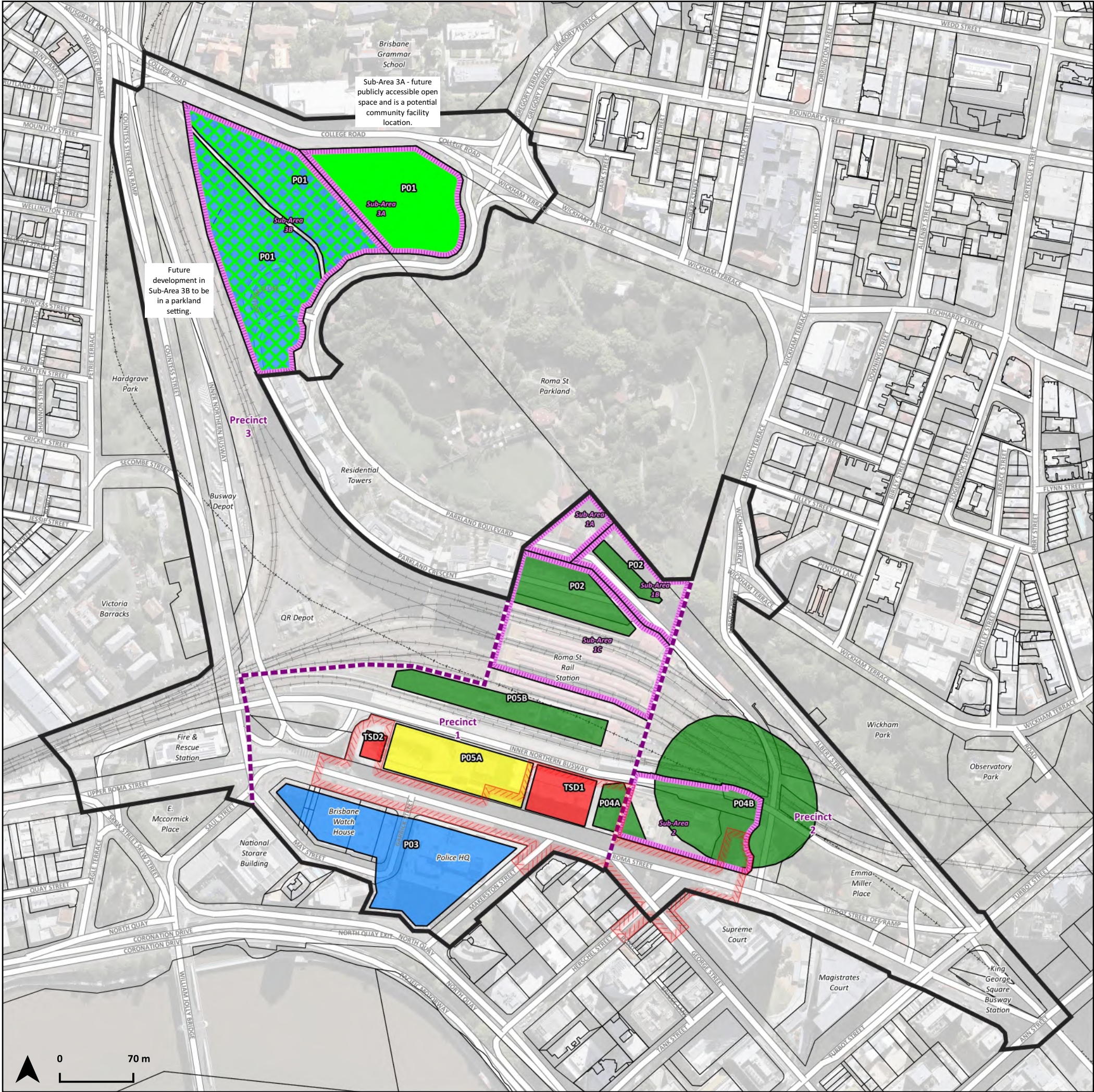
| Scope Owner | Map Reference / Site No | Approximate Location |
|---|-------------------------|--|
| CRRDA Precincts Delivery Partner | P1 | Existing Roma St Parkland works depot located at the northern end of the PDA |
| | P2 | Existing Roma St Parklands Activity Building and Platform 10. Located on / over Parklands Blvd. |
| | P3 | Split over two (2) blocks encompassing the Police Headquarters, Brisbane Watch House, Biala Building and a two-storey commercial building on Roma St. |
| | P4A | Within footprint of the former Brisbane Transit Centre (BTC) East Tower, this is referred to as former “Hotel Jen” site. It is part of the Pulse Tunnels, Stations and Development (TSD) construction site that will be handed back to CRRDA for development at the completion of that contract (Future Over Station Development (FOSD-East)). |
| | P4B | Potential Major Entertainment Area (PMEA) site, further development opportunities requiring podium construction over the existing rail corridor and Emma Miller Place. |
| | P5A | Intersects the former BTC bus ramps / station, BTC podium. Part of the Pulse (TSD) construction site that will be handed back to CRRDA for development at the completion of that contract (FOSD - West). |
| | P5B | Over Roma St Station Platforms 2 and 3 |
| Pulse Consortium (TSD) | TSD1 | Proposed CRR Roma St Station Building |
| | TSD2 | Proposed CRR Roma St Plant / Services Building |

Roma Street Cross River Rail Priority Development Area
Baseline Potential Development Scenario
Staging Plan - Reference Scheme

Figure 2

Legend

- Existing Rail
- Existing Road
- CRR Alignment
- Base Parcels
- PDA Boundary
- TSD Delivery Area
- PDA Precinct Boundary
- PDA Sub-Area Boundary
- Development Sites (by Stage & Year) (Indicative Only)
 - Stage 1 (TSD) (2020-2025)
 - Stage 2 (2025 - 2026)
 - Stage 3 (2026 - 2031)
 - Stage 4 (2032 - 2041)
- Future Publicly Accessible Open Space
 - Parkland Setting Development (inc. Publicly Accessible Open Space)
 - Publicly Accessible Open Space (Park)



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Data Sources
QLD Government 2021, Brisbane City Council 2021

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2.2 Development Scenarios

Potential Development Land Use Scenarios assessed are summarised in Table 2. Maps and yield tables associated with these scenarios are contained in Attachment A Development Yield Maps & Tables.

Table 2 Land Use Scenarios

| Scenario | Description |
|--------------------------|---|
| Scenario 1 (Baseline) | "Baseline" scenario that has been the focus of reference design planning, as well as some sensitivity analysis. |

2.3 Equivalent Persons Estimate

2.3.1 Methodology

Estimates of Equivalent Persons (EP) unit of demand were developed for the Baseline Potential Development Scenario. The estimates were developed in accordance with the South East Queensland (SEQ) Water and Sewer Design and Construction Code ("the SEQ Code").

The EP estimate is specific to water and wastewater network planning, and it should not be interpreted as representing true future population of development in the PDA.

Totals shown in tables and charts (including EP, water and wastewater demand estimates) are not calculated "as formatted" and often include decimal parts that are not visible due to number formatting.

2.3.2 Existing Scenario / Demand Credits

An Existing Land Use EP estimate was prepared to quantify demand credits associated with the removal of existing buildings / demand sources as potential sites are redeveloped. The analysis found that the existing EP credits equates to approximately 930 EPs.

Roma Street Cross River Rail Priority Development Area
Water & Wastewater Technical Note

Figure 03
Existing Buildings

Legend

- CRRDA Roma St PDA Boundary
- Existing Buildings

Development Sites (by Owner)

- CRRDA Precincts
- Pulse

Roads & Transit

- Road
- Transit
- Lots

| MapRef | Name |
|--------|---|
| EX-01 | Existing BTC Podium |
| EX-02 | Existing BTC West Tower |
| EX-03 | Existing BTC East Tower |
| EX-04 | Existing Hotel Jen |
| EX-05 | Existing Police Headquarters / Police Museum Building |
| EX-06 | Existing Brisbane Watch House |
| EX-07 | Existing Private Commercial Building |
| EX-08 | Existing Biala Building |
| EX-09 | Existing Works Depot |
| EX-10 | Existing Activity Building |
| EX-11 | Existing Platform 10 |

Data Sources
QLD Government 2020, Brisbane City Council 2020

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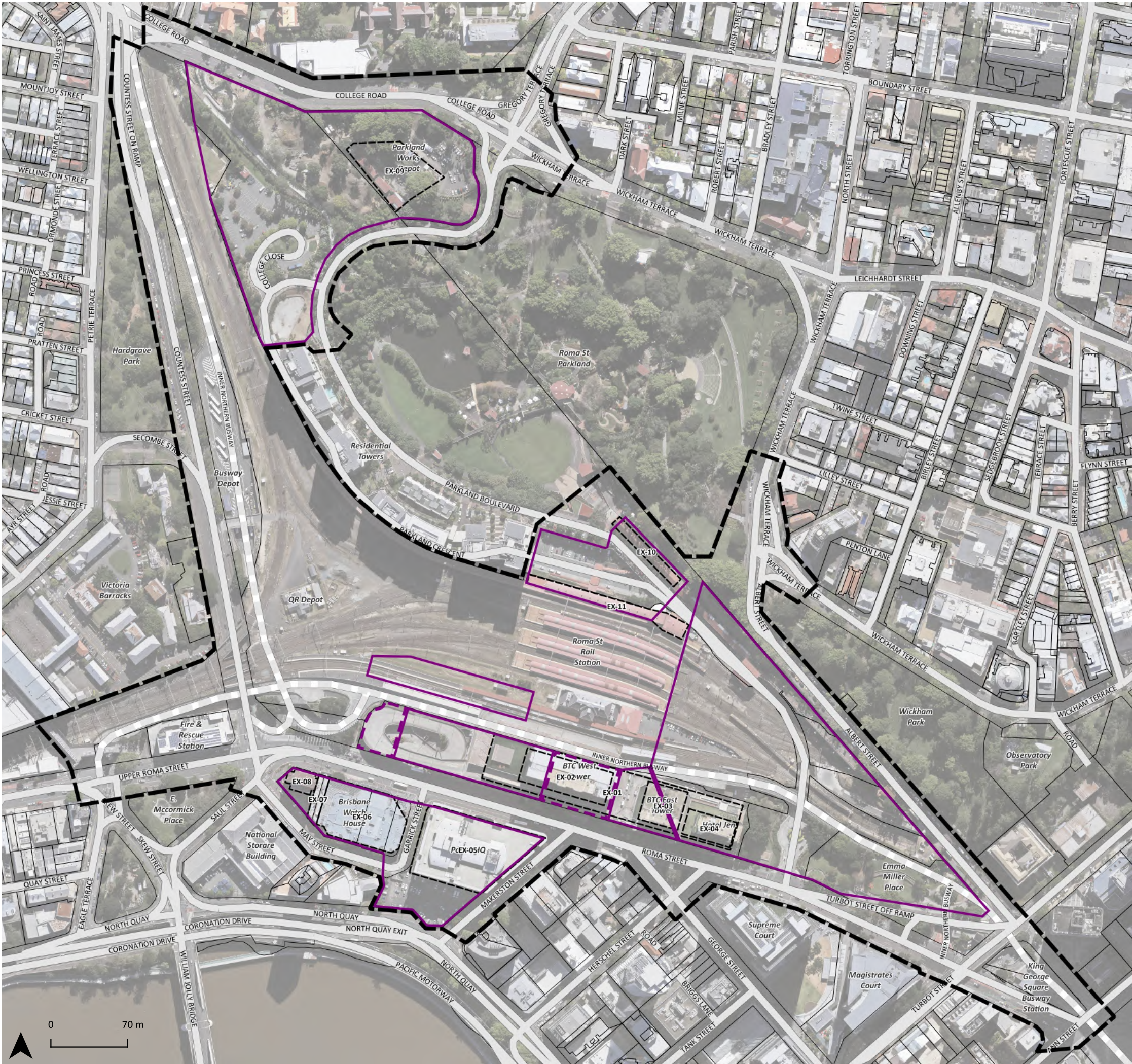


Table 3 Summary of Potential EP Credits

| Project Code & Name | EP Credit | EP Credit (m2 GFA equiv.) | EP Credit (Attach. Dwell. equiv.) |
|--------------------------------------|------------|------------------------------|---|
| P1 (Works Depot) | 2 | 333 | 1 |
| P2 (Activity Building / Platform 10) | 6 | 1,000 | 3 |
| P3 (Police HQ, Courts, Biala) | 308 | 51,333 | 176 |
| P4A (Hotel Jen Redevelopment) | 352 | 58,667 | 201 |
| P4B (PMEA Site) | - | - | - |
| P5A (Brisbane Transit Centre) | 262 | 43,667 | 150 |
| P5B (Roma St Station Platform 2/3) | - | - | - |
| TSD1 (CRR Station Building) | - | - | - |
| TSD2 (CRR Services Building) | - | - | - |
| Total | 930 | 155,000 | 531 |

2.3.3 Development Scenarios

Table 4 and Figure 4 summarises the assumed EP demand credits and future demands associated with the Baseline Development Scenario.

Under this scenario, the demand credits allocated to the former BTC and Hotel Jen will likely be consumed upon the construction of approximately 100,000 m² of Commercial / Retail GFA, assumed to be delivered as part of Stage 2 (OSD-W).

Table 4 Summary of EP Changes for Development Sites and Stages in Development Scenario

| Project Code & Name | Stage 1 (TSD) (2020 - 2025) | Stage 2 (2025 - 2026) | Stage 3 (2026 - 2031) | Stage 4 (2032 - 2041) | Total |
|--------------------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|--------------|
| P1 (Works Depot) | - | - | - | 495 | 495 |
| P2 (Activity Building / Platform 10) | - | - | 485 | - | 485 |
| P3 (Police HQ, Courts, Biala) | - | - | - | 1,455 | 1,455 |
| P4A (Hotel Jen Redevelopment) | -334 | - | 705 | - | 371 |
| P4B (PMEA Site) | - | - | 367 | - | 367 |
| P5A (Brisbane Transit Centre) | -262 | 1,158 | - | - | 896 |
| P5B (Roma St Station Platform 2/3) | - | - | 1,832 | - | 1,832 |
| TSD1 (CRR Station Building) | - | - | - | - | - |
| TSD2 (CRR Services Building) | - | - | - | - | - |
| Total | -596 | 2,990 | 3,389 | 1,950 | 5,901 |

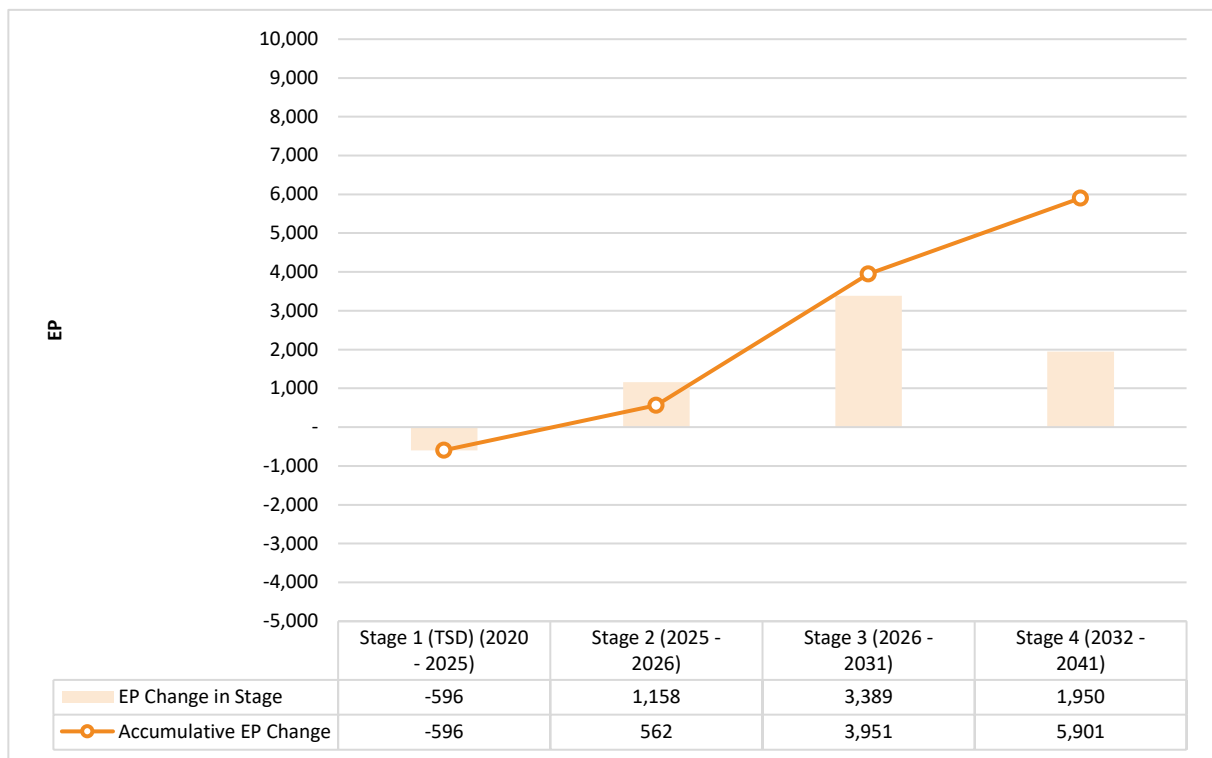


Figure 4 Summary of EP Change for Stages in Development Scenarios

3 Water Supply

3.1 Existing Infrastructure

Service Providers

The primary external water service provider is UU.

There is a network of private water mains within Roma St Parkland which is shown in the UU network dataset as being State Government owned.

Infrastructure

The external water network around the PDA is shown in Figure 5. Notable water infrastructure in the PDA is as follows:

- 910mm diameter Mild Steel (MS) trunk water main that intersects the PDA in a northwest / southeast direction through Roma St Parklands and along the Albert St corridor. This is part of the S002 Bardon to City Trunk Water Main which is an important supply main to the CBD. It was constructed in 1975.
- 300mm diameter reticulation main on north side of Roma St

The PDA falls within the Green Hill Water Supply Zone.

Existing Network Performance

The PDA is well-serviced in terms of existing potable water flow and pressure to accommodate the potential development opportunities identified in the PDA.

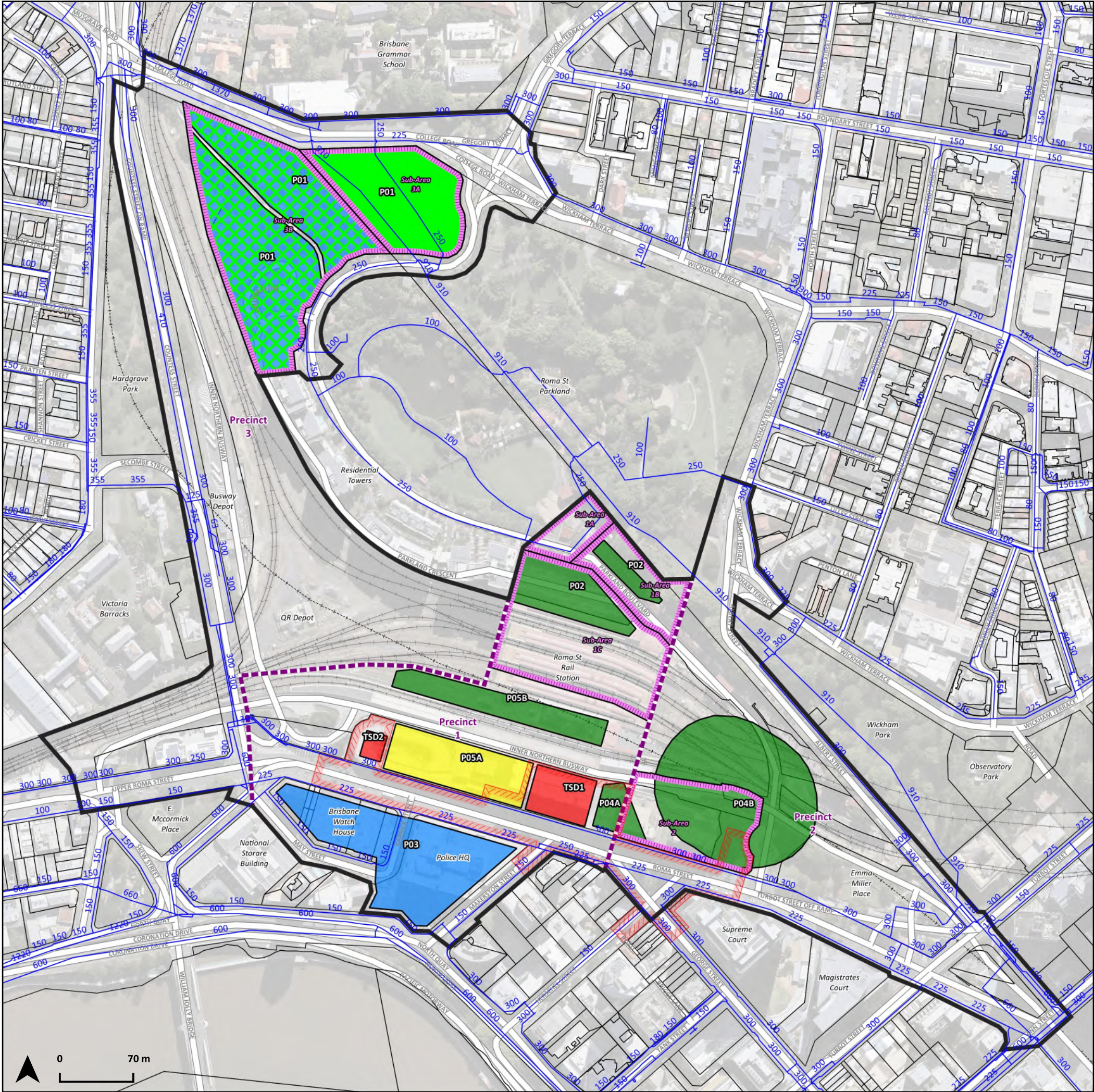
Existing Planned Infrastructure

No relevant future UU water infrastructure projects are identified in or around the PDA in UU's Netserv Plan 2020.

Roma Street Cross River Rail Priority Development Area
Water & Wastewater Technical Note
Figure 5
Existing Water Network

Legend

- Existing Rail
- Existing Road
- CRR Alignment
- Base Parcels
- PDA Boundary
- TSD Delivery Area
- PDA Precinct Boundary
- PDA Sub-Area Boundary
- Development Sites (by Stage & Year) (Indicative Only)
 - Stage 1 (TSD) (2020-2025)
 - Stage 2 (2025 - 2026)
 - Stage 3 (2026 - 2031)
 - Stage 4 (2032 - 2041)
- Future Publicly Accessible Open Space
 - Parkland Setting Development (inc. Publicly Accessible Open Space)
 - Publicly Accessible Open Space (Park)
- Water Existing Main



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Data Sources
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3.2 Demand Estimates

Water demands estimates for the Existing and Development Scenarios were developed based on the SEQ Code. A summary of the Peak Hour (PH) demand estimate change for the projects is shown in Table 5.

Table 5 Peak Hour (PH) Demand Estimates

| Project Code & Name | Stage 1 (TSD) (2020 - 2025) | Stage 2 (2025 - 2026) | Stage 3 (2026 - 2031) | Stage 4 (2032 - 2041) | Total |
|--------------------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|-------------|
| P1 (Works Depot) | - | - | - | 3.9 | 3.9 |
| P2 (Activity Building / Platform 10) | - | - | 4.4 | - | 4.4 |
| P3 (Police HQ, Courts, Biala) | - | - | - | 13.5 | 13.5 |
| P4A (Hotel Jen Redevelopment) | -3.2 | - | 6.7 | - | 3.4 |
| P4B (PMEA Site) | - | - | 2.9 | - | 2.9 |
| P5A (Brisbane Transit Centre) | -2.0 | 9.0 | - | - | 7.0 |
| P5B (Roma St Station Platform 2/3) | - | - | 17.7 | - | 17.7 |
| TSD1 (CRR Station Building) | - | - | - | - | - |
| TSD2 (CRR Services Building) | - | - | - | - | - |
| Total | -5.3 | 9.0 | 31.7 | 17.3 | 52.8 |

3.3 Development Risks & Opportunities

The potential water supply risks and opportunities associated with the PDA are summarised in Table 6. These risks and opportunities were identified through service provider engagement, demand estimates and other investigations.

Table 6 Summary of Development Impacts on Water Supply Network

| Aspect | Development Considerations |
|---|---|
| General Network Capacity | <ul style="list-style-type: none"> UU advised through the Service Advice Notice (SAN) process that the PDA is well-served in terms of potable water supply to support future development opportunities in the PDA |
| Trunk main in Roma St Parklands | <ul style="list-style-type: none"> There is a large diameter, critical water trunk main that runs north-west to south-east through the Parklands and development site PREC-01. Development in P1 (Works Depot) will need to: <ul style="list-style-type: none"> Manage construction risks to avoid comprising the integrity of the main as it is a critical supply link into the City. Avoid putting buildings / structures within a horizontal clearance each side of the main (10m total, 5m each side of the main CL) Avoid use of reinforcement for roadways / paths that traverse the main |
| Protections / Relocations for Individual Developments | <ul style="list-style-type: none"> Individual developments within the PDA may require in specific localised upgrades (e.g. at the connection point) or protection / relocations. |

3.4 Potential Infrastructure Works

UU advised through the SAN process that there is unlikely to be external infrastructure upgrades associated with the development based on the Development Scenario 1.

4 Wastewater

4.1 Existing Infrastructure

Service Providers

The primary external wastewater service provider is UU.

Internal Catchments & Infrastructure

A map of the existing wastewater network around the PDA is contained in Figure 6. A network diagram of the existing and possible future wastewater network is contained in Figure 7.

The wastewater network intersecting the PDA is effectively split into two (2) separate catchments. Notable features of the wastewater catchments intersecting the PDA include:

- Catchment 1: Wastewater network upstream of sewer main on Makerston St, divided into two (2) sub-catchments:
 - Catchment 1A:
 - Services existing Roma St Fire / Ambulance Station, Victoria Barracks, The Barracks Shopping Centre, Busway depot, QR Depot
 - Contains the following mains / subnetworks:
 - 150mm diameter Earthenware (EW) sewer servicing The Barracks Shopping Centre
 - 150mm diameter EW / Cast Iron (CI) sewer along Countess St
 - Discharges into Catchment 1B at manhole MH167453 on the intersection of Saul St and May St
 - This sub-network may eventually be diverted away from the PDA as part of the UU project CBD-2016-GM-0016 (identified in 2020 Netserv Plan) Augmentation of May St.
 - Catchment 1B:
 - Services existing BTC, Hotel Gen, Brisbane Watch House / Police Museum, various properties on Saul St, May St, Garrick St and Makerston St
 - Contains following mains / subnetworks:
 - 150mm diameter EW sewer along May St, Garrick St
 - 225mm diameter sewer on Roma St with connections from the Brisbane Transit Centre, Roma St Station and Hotel Jen.
 - 225mm diameter earthenware sewer on Makerston St that discharges into the North Quay sewer.
 - Discharges into the North Quay sewer on the at the intersection of Makerston St and North Quay
- Catchment 2:
 - Services Works Depot (in PDA) and residential towers along Parkland Blvd (outside of PDA)
 - Contains following mains / subnetworks:
 - Small network of 150/255mm diameter VC sewer servicing the Roma St Parklands
 - 225mm diameter Vitrified Clay (VC) sewer servicing
 - 375/400mm diameter Ductile Iron (DI) / VC sewer along Parkland Blvd, under the rail lines and Inner-Northern Busway
 - Discharges into the S1 sewer on Turbot St.

Roma Street Cross River Rail Priority Development Area
Water & Wastewater Technical Note
Figure 6
Existing Wastewater Network

Legend

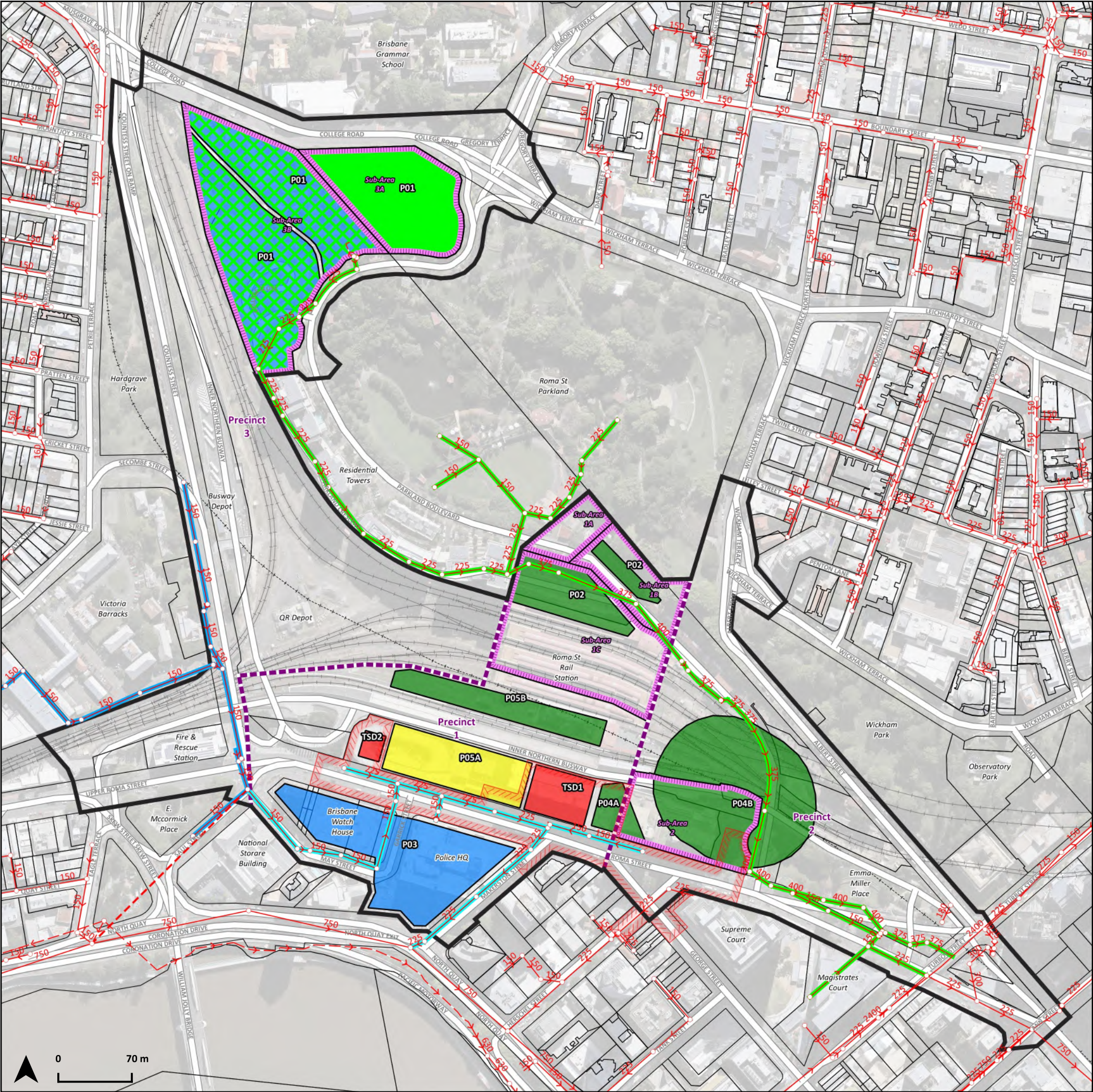
- Existing Rail
- Existing Road
- CRR Alignment
- Base Parcels
- PDA Boundary
- TSD Delivery Area
- PDA Precinct Boundary
- PDA Sub-Area Boundary
- Development Sites (by Stage & Year) (Indicative Only)
 - Stage 1 (TSD) (2020-2025)
 - Stage 2 (2025 - 2026)
 - Stage 3 (2026 - 2031)
 - Stage 4 (2032 - 2041)
- Future Publicly Accessible Open Space
 - Parkland Setting Development (inc. Publicly Accessible Open Space)
 - Publicly Accessible Open Space (Park)
- Wastewater Existing MH
- Wastewater Existing Gravity Main
- Wastewater Existing Rising Main
- Wastewater Currently Planned Main
- Wastewater Catchments
 - Catchment 1A
 - Catchment 1B
 - Catchment 2

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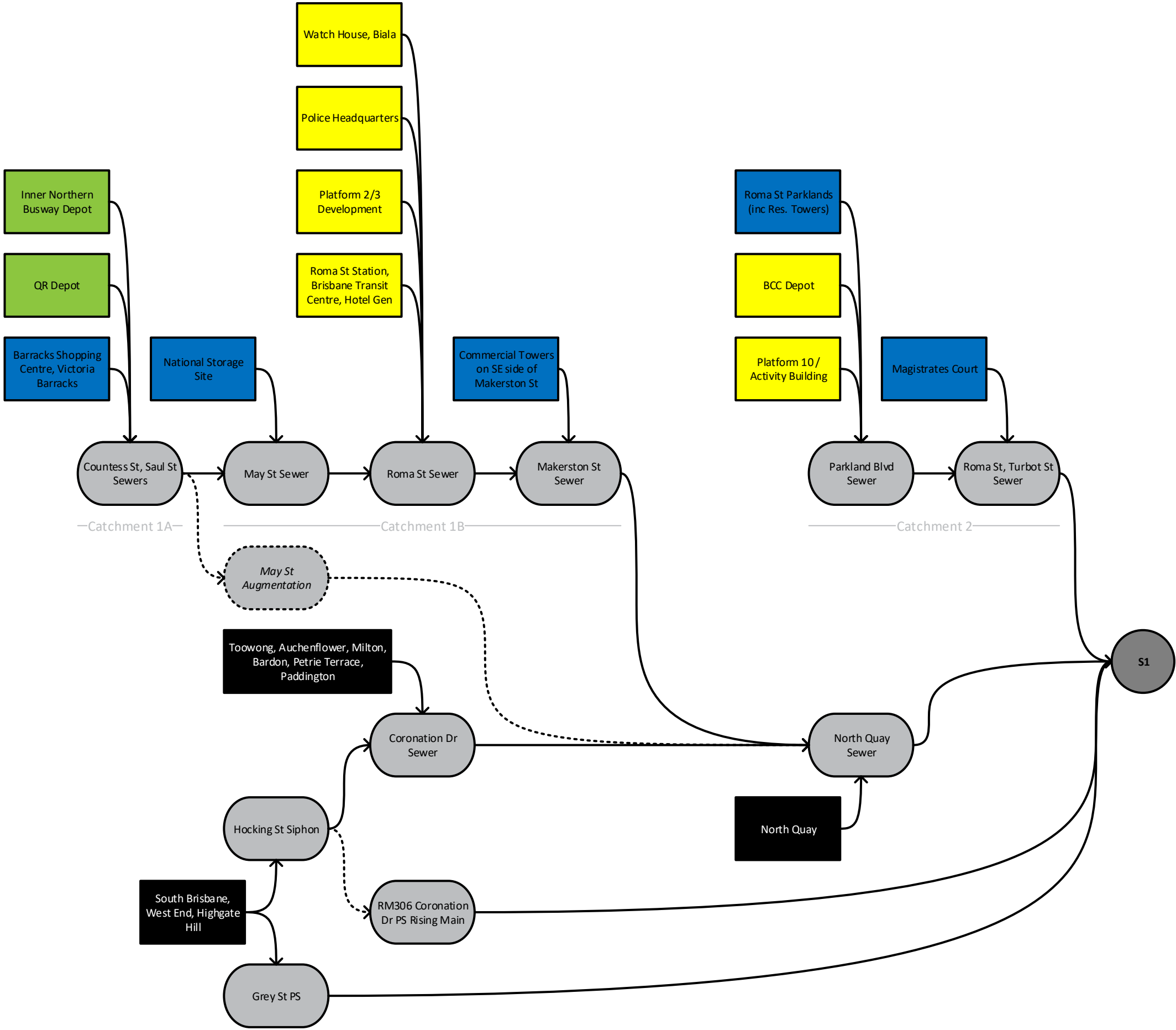


Roma St Cross River Rail PDA

Figure 07
Existing Sewerage Network Diagram

Key

- Wastewater Source inside PDA (to be replaced / altered by proposed development)
- Wastewater Source inside PDA (no proposed development)
- Wastewater Source inside PDA (no proposed development)
- Large external catchment
- Existing Sewerage Infrastructure
- Existing Planned Sewerage Infrastructure
- Potential Future PDA Servicing Infrastructure
- Existing Link
- Existing Planned Link



External Catchments & Infrastructure

The PDA is within a complex wastewater network where the upstream catchment and flows can change depending on the flow conditions.

Notables features of the wastewater infrastructure outside the PDA are as follows:

- 750mm diameter Unreinforced Concrete (UC) trunk sewer on North Quay (the “North Quay Sewer”) which sewer discharges in to the S1 sewer
- 2400mm diameter trunk Sewer on Roma St: this is the S1 trunk sewer, arguably the largest and most significant sewer in the UU network. The sewer generally flows through the CBD and generally along the Brisbane River before terminating at the SP010 Eagle Farm Sewage Pump Station located in Eagle Farm.

The simplified catchment of the North Quay sewer is quite extensive and is shown in Figure 8. It encompasses portions of Toowong, Auchenflower, Bardon, Milton, Paddington, Petrie Terrace and Brisbane City on the northern side of the river, and portions of West End, Highgate Hill and South Brisbane on the southern side of the river.

As shown in Figure 7, the West End / Highgate Hill / South Brisbane catchment discharges into the Coronation Dr sewer via the Hocking St siphon under the Brisbane River. The catchment also discharges into the S1 sewer via the Grey St PS rising main under certain flows conditions.

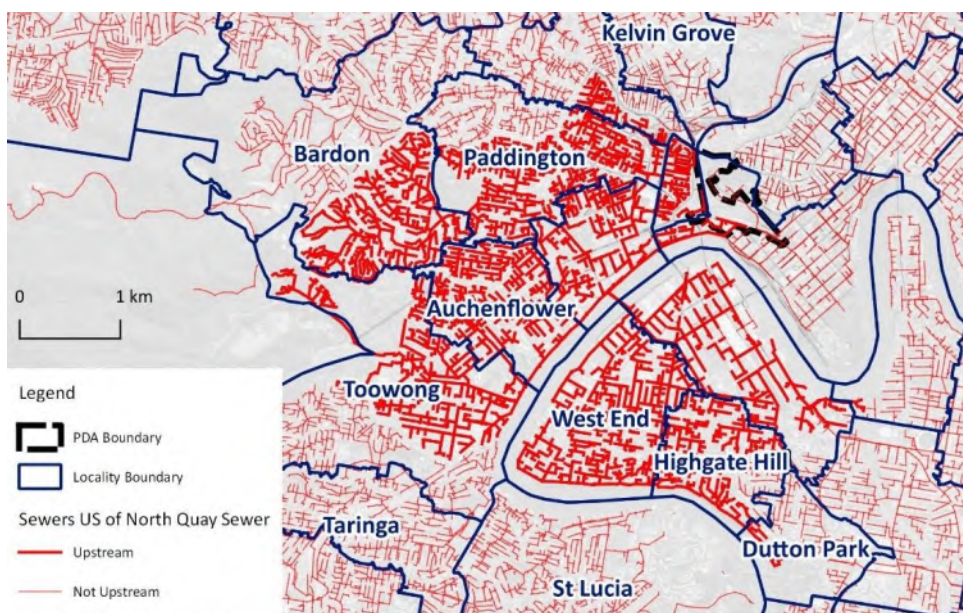


Figure 8 Map of sewer network upstream of North Quay sewer

A spatial analysis was undertaken to quantify the existing and future residential population within the catchment of the North Quay sewer. This was to assist with understanding the proportion of EP discharging into the North Quay sewer relative to the upstream network.

This was performed by extracting the 2016 population of the Australian Bureau of Statistic (ABS) mesh blocks intersected by sewer gravity mains upstream of the sewer. Population growths for the relevant ABS SA2 areas were applied to the mesh blocks to derive the 2041 estimates.

The results of the analysis are shown in Table 7 below. The analysis found that there was an estimated 2016 population of 49,922 located in the approximate catchment of the North Quay sewer, increasing to 89,820 by 2036.

It is important to note that this represents the population only. It is not an EP and does not include non-residential components.

Table 7 Indicative Population of North Quay Sewer Catchment (2016)

| Side of River | 2016 Population | Growth | 2036 Population |
|---------------|-----------------|-------------|-----------------|
| North Total | 28,242 | +27% | 35,956 |
| South Total | 21,680 | +148% | 53,865 |
| Total | 49,922 | +80% | 89,820 |

Existing Network Performance

As advised by UU through SANs and engagement workshops, the network performance of wastewater infrastructure in and around the PDA is summarised as follows:

- Catchment 1:
 - The following sewers are constrained:
 - 150mm diameter mains on May St, Garrick St.
 - 225mm diameter main on Makerston St
- Catchment 2:
 - The Parkland Blvd sewer is not currently constrained and will likely support an increase in flows
- External:
 - 750mm North Quay sewer is constrained, particularly in wet weather flow
 - The S1 sewer and downstream infrastructure, including SP010 Eagle Farm SPS, are constrained.

Existing Planned Infrastructure

UU's latest Water Netserv Plan 2020 was published in March 2020 and enacted on 1 July 2020.

The updated Netserv Plan contains the following Wastewater projects significant to the PDA:

- CBD-2016-GM-0016 Augmentation of May Street Sewers (Estimated timing 2026, Establishment cost \$1,217,000): an interceptor sewer to be installed from manhole on May St / Saul St intersection to manhole at the U/S end of the North Quay Sewer. This would divert flows from Catchment 1A away from the PDA. (Note: this project effectively replaces a related UU proposed project in Makerston St that was 2016 BCC LGIP plan and Baseline Report).

This project is shown in Figure 6.

There are also several potential projects planned in the Toowong, South Brisbane and West End area that may reduce flows in the North Quay sewer by diverting wastewater flows to the head of the S1 (D/S of North Quay) or away from the catchment.

Relevant pages of the updated the Netserv Plan are contained in Attachment B Netserv Plan Extract.

4.2 Demand Estimates

Wastewater demand estimates for the Potential Development Scenario was developed based on the SEQ Code guidelines. Peak Wet Weather Flow (PWWF) estimates for the projects are shown in Table 8.

Table 8 Summary of Peak Wet Weather Flow (PWWF) change estimates for projects

| Project Code & Name | Stage 1 (TSD) (2020 - 2025) | Stage 2 (2025 - 2026) | Stage 3 (2026 - 2031) | Stage 4 (2032 - 2041) | Total |
|--------------------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|-------------|
| P1 (Works Depot) | - | - | - | 5.5 | 5.5 |
| P2 (Activity Building / Platform 10) | - | - | 7.5 | - | 7.5 |
| P3 (Police HQ, Courts, Biala) | - | - | - | 15.5 | 15.5 |
| P4A (Hotel Jen Redevelopment) | -3.9 | - | 8.1 | - | 4.2 |
| P4B (PMEA Site) | - | - | 4.4 | - | 4.4 |
| P5A (Brisbane Transit Centre) | -3.7 | 12.3 | - | - | 8.6 |
| P5B (Roma St Station Platform 2/3) | - | - | 20.2 | - | 20.2 |
| TSD1 (CRR Station Building) | - | - | - | - | - |
| TSD2 (CRR Services Building) | - | - | - | - | - |
| Total | -7.7 | 12.3 | 40.2 | 21.0 | 65.8 |

As previously noted, the existing EP credits equates to approximately 930 EPs. These are distributed across the two sewer catchments as follows:

- Catchment 1: 922
- Catchment 2: 8

4.3 Development Risks & Opportunities

The potential wastewater risks and opportunities associated with the PDA are summarised in Table 9. These risks and opportunities were identified through service provider engagement, demand estimates and other investigations.

Table 9 Summary of Development Risks & Opportunities on Wastewater Network

| Aspect | Development Considerations |
|---|---|
| General Network Performance | <ul style="list-style-type: none"> The PDA sits within the S1 catchment, which is generally constrained. Other existing and future CRR PDA sites (including Gabba, Boggo Rd, Albert St) fall within the S1 catchment. |
| Existing Network Model | <ul style="list-style-type: none"> There are some deficiencies in the current network model due to the age of the inner city network and its complexity. This reduces the accuracy of analysis. A more robust network model will likely be required to accurately model the impact of potential future development on the wastewater network. |
| Makerston St Sewer is constrained | <ul style="list-style-type: none"> UU identified that the Makerston St sewer is unlikely to have sufficient flow capacity to support a significant increase in flow associated with development in PDA Approximately 614 EP of load will be removed from the Makerston St catchment through the BTC and Hotel Jen demolition. |
| North Quay sewer is constrained | <ul style="list-style-type: none"> UU have advised North Quay St sewer is constrained (it currently flows full under average dry weather conditions) and is unlikely to have sufficient flow capacity to support significant increase in flow associated with PDA development. North Quay sewer has large upstream external catchment that encompasses a relatively large inner-city catchment, including areas of projected high growth. |
| Parkland Blvd sewer is not constrained | <ul style="list-style-type: none"> UU has advised that the Parkland Blvd sewer is not currently constrained and is likely to support a significant increase in flow without triggering an upgrade. Consideration should be given to transferring flows from Catchment 1 to Catchment 2 via a pumped option (this would strictly be a private pump station) to reduce flows in Makerston St and North Quay sewers. |
| Protections / Relocations for Individual Developments | <ul style="list-style-type: none"> Individual developments within the PDA may require in specific localised upgrades (eg at the connection point) or protection / relocations. |

4.4 Potential Infrastructure Works

Several potential infrastructure projects were identified to service the wastewater demand generated by the PDA development. These potential projects options are described in Table 10.

The projects below are also identified in network diagram in Figure 9 and highlighted in Figure 10.

Cost estimates for these projects are contained in Attachment C Cost Estimates.

Table 10 Potential Wastewater Infrastructure Projects

| No | Potential Project | Description of Works |
|---------|---|--|
| SEW-01A | Augmentation of Makerston St Sewer (medium to long term option) | <ul style="list-style-type: none"> • Driver: Makerston St sewer is constrained • Objective: Increase the capacity of wastewater network along Makerston St to service increased Catchment 1B flows associated with the development in the PDA. • Potential Infrastructure: <ul style="list-style-type: none"> - Dedicated main on Makerston St only servicing the PDA developments (this solution is contained in DCOP) • Potential Alternative Infrastructure: <ul style="list-style-type: none"> - Replacement of the existing Makerston St sewer with a larger main. • Timing / Trigger: <ul style="list-style-type: none"> - An appropriate trigger for this project may be when PDA-related EP load discharging into the Makerston St sewer offsets that of the EP removed through the demolition of the Roma St Station / BTC. - There may be opportunities to defer this project by reducing flows in Catchment 1B through on-site treatment, diversion to Catchment 2 with private PS. - Timing may be impacted by the UU May St Augmentation project. • Notes: <ul style="list-style-type: none"> - This project was proposed by UU as part of the original SAN process. • Indicative Cost: <ul style="list-style-type: none"> - \$3,527,739 |
| SEW-01B | Augmentation of North Quay Sewer (medium to long term option) | <ul style="list-style-type: none"> • Driver: North Quay Sewer is constrained • Objective: Increase the capacity of wastewater network along North Quay to service increased Catchment 1B flows associated with the development in the PDA. • Potential Infrastructure: <ul style="list-style-type: none"> - Augmentation of existing North Quay sewer with capacity equivalent ultimate EP of PDA generated demands from Catchment 2B (this solution is contained in DCOP). • Potential Alternative Infrastructure: <ul style="list-style-type: none"> - Funding contribution to UU for project to upsize existing North Quay trunk main or other downstream infrastructure capacity improvement project. • Notes: <ul style="list-style-type: none"> - This project was proposed by UU through the original SAN process. - The proportion of existing and future EP in the North Quay sewer associated with the PDA is likely low relatively to that of the existing and future EP in the upstream catchment. • Indicative Cost: <ul style="list-style-type: none"> - \$6,780,059 |

Potential Servicing Strategy

The preferred servicing strategy for the PDA is as follows:

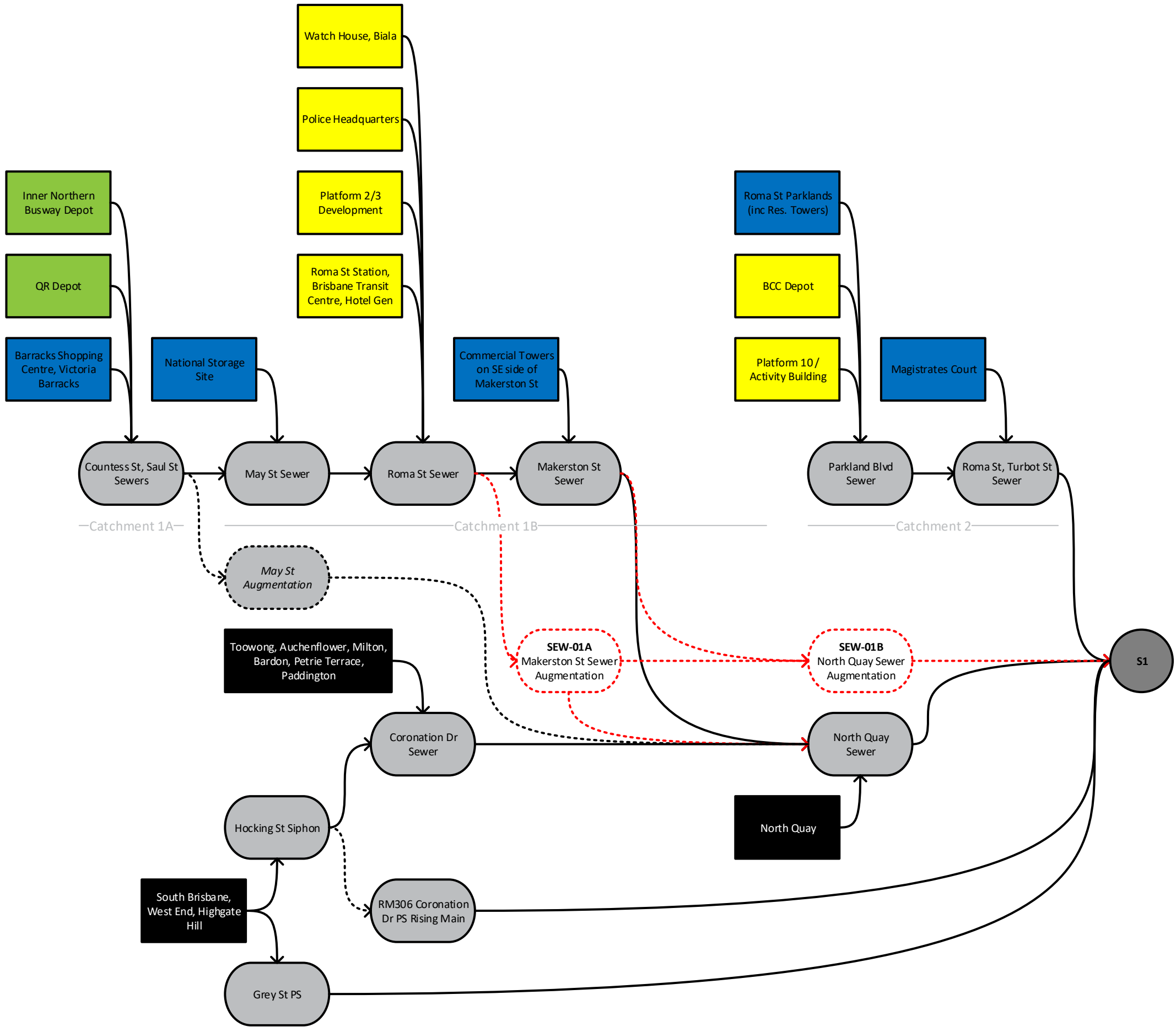
- General Considerations:
 - All delivery years are approximate only. Actual delivery timeframes will be dependent on the final yields and demands at the time of development.
 - Developers should begin engagement with UU early to ensure the early identification and adoption of cost effective and optimised servicing solutions.
 - This strategy will be subject to ongoing review by CRRDA and UU to ensure the lowest cost wastewater solution is provided.
 - All PDA developments to implement integrated water management strategies (including on-site treatment options) to encourage internal reuse and reduce demand on external wastewater network.
- Catchment 1:
 - 2026: Initial FOSD – West demand to consume demand credits in generated through removal of existing demand sources (eg BTC, Hotel Jen)
 - Following consumption of credits (~2027):
 - Delivery of SEW-01A Makerston St sewer augmentation (SEW-01A)
 - Delivery of SEW-01B North Quay sewer augmentation (SEW-01B)
- Catchment 2:
 - Connect P1, P2, P4B developments into Parkland Blvd sewer.

Roma St Cross River Rail PDA

Figure 09
Future Sewerage Network Diagram

Key

- Wastewater Source inside PDA (to be replaced / altered by proposed development)
- Wastewater Source inside PDA (no proposed development)
- Large external catchment
- Existing Sewerage Infrastructure
- Existing Planned Sewerage Infrastructure
- Potential Future PDA Servicing Infrastructure
- Existing Link
- Existing Planned Link



Roma Street Cross River Rail Priority Development Area
Water & Wastewater Technical Note
Figure 10
Future Wastewater Network

Legend

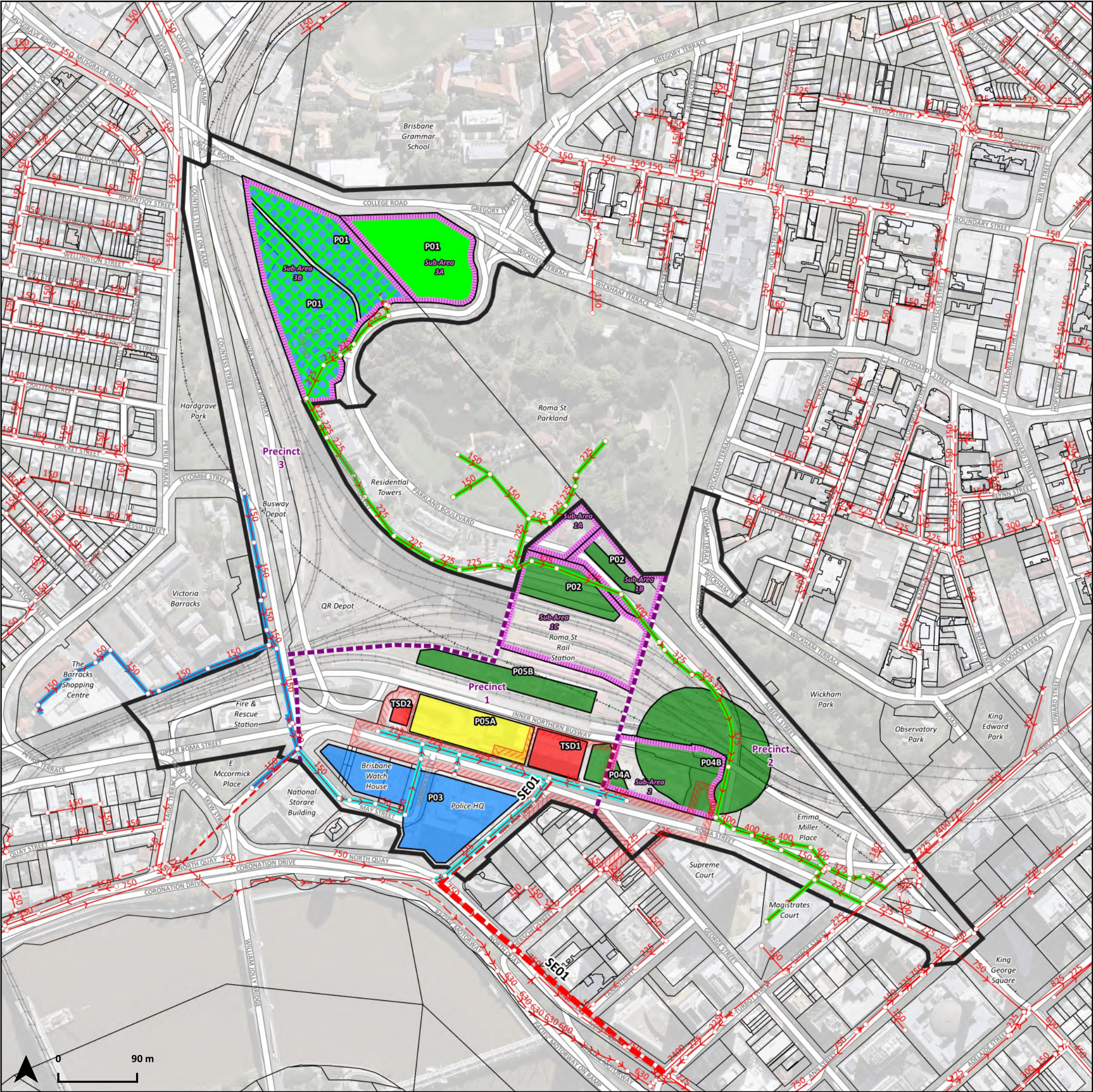
- Existing Rail
- Existing Road
- CRR Alignment
- Base Parcels
- PDA Boundary
- TSD Delivery Area
- PDA Precinct Boundary
- PDA Sub-Area Boundary
- Development Sites (by Stage & Year) (Indicative Only)
 - Stage 1 (TSD) (2020-2025)
 - Stage 2 (2025 - 2026)
 - Stage 3 (2026 - 2031)
 - Stage 4 (2032 - 2041)
- Future Publicly Accessible Open Space
 - Parkland Setting Development (inc. Publicly Accessible Open Space)
 - Publicly Accessible Open Space (Park)
- Wastewater Existing MH
- Wastewater Existing Gravity Main
- Wastewater Existing Rising Main
- Wastewater Currently Planned Main
- Wastewater Catchments
 - Catchment 1A
 - Catchment 1B
 - Catchment 2
- Wastewater Project Alignment

Version Date & Time: 25/05/2021 23:34

Data Sources
QLD Government 2021, Brisbane City Council 2021

Disclaimer
While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, this map contains data from a number of sources - no warranty is given that the information contained on this is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it. This map is not a design document.

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C:\Local working\Temporary working for Roma St\Roma St - Water Wastewater Working draw b1.gxd

5 Summary

Key findings of the Water and Sewerage investigations were as follows:

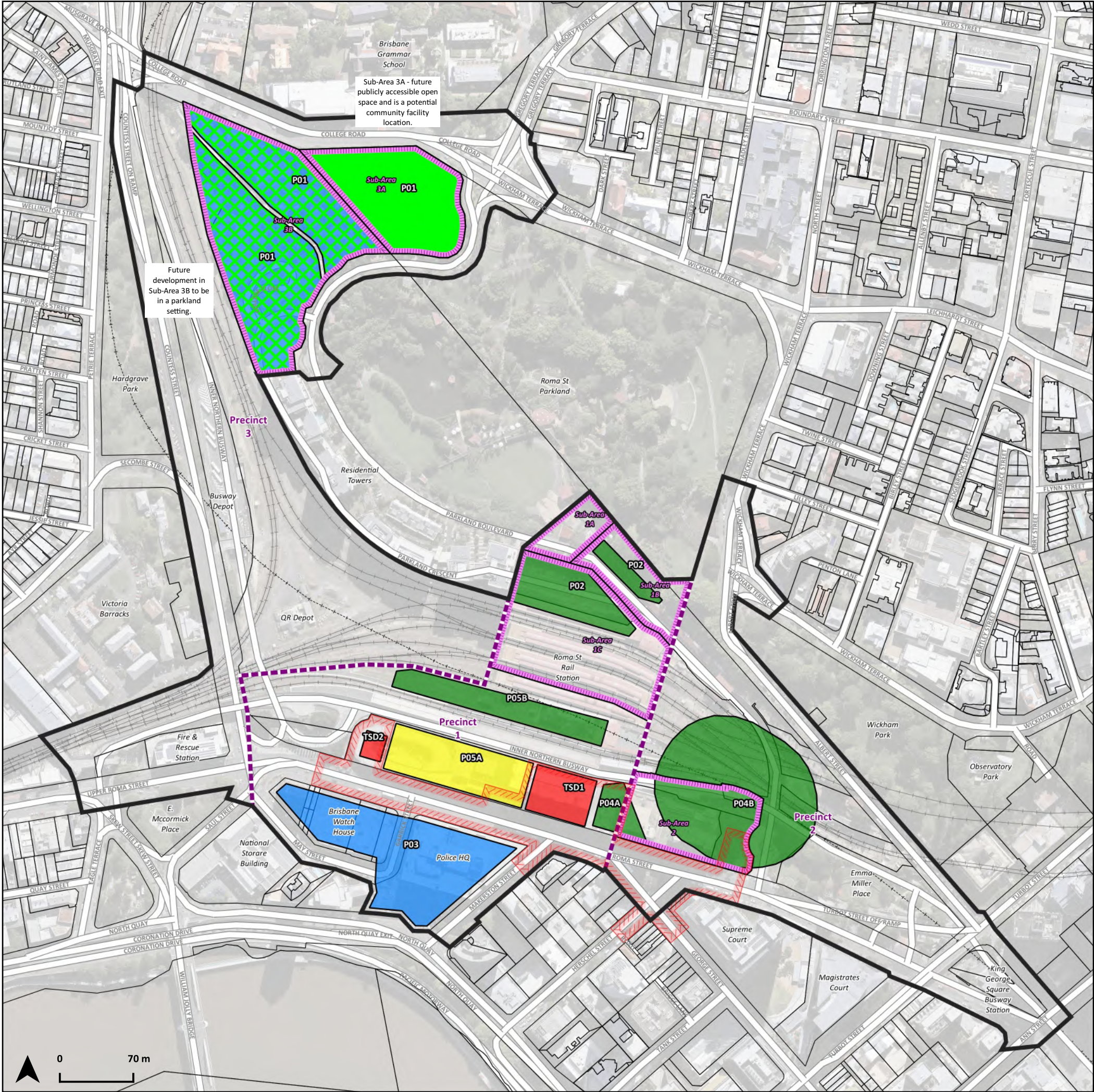
- UU is the primary water and wastewater service provider for the PDA
- There is likely to be a notable increase in water and wastewater service demand associated with the potential future development opportunities in the PDA
- Water Supply:
 - The Precinct is generally well-serviced in terms of water supply pressure and flow
 - There is unlikely to be a requirement for external water supply infrastructure upgrades to service the future development demands in the PDA
 - The critical, large diameter trunk watermain running through the Parkland will need to be protected
- Wastewater:
 - The PDA is divided into two (2) catchments:
 - Catchment 1:
 - Services the south / west of the PDA
 - Capacity constrained and may require infrastructure upgrades inside and outside of the PDA to adequately service the demand generated by the potential future development opportunities. This may involve sewer upgrade works in Makerston St and North Quay
 - Catchment 2:
 - Services north / east of PDA
 - Generally unconstrained and unlikely to require infrastructure upgrades to service potential future development opportunities.

Attachment A Development Yield Maps & Tables

Roma Street Cross River Rail Priority Development Area
Baseline Potential Development Scenario
Staging Plan - Reference Scheme

Legend

- Existing Rail
- Existing Road
- CRR Alignment
- Base Parcels
- PDA Boundary
- TSD Delivery Area
- PDA Precinct Boundary
- PDA Sub-Area Boundary
- Development Sites (by Stage & Year) (Indicative Only)
 - Stage 1 (TSD) (2020-2025)
 - Stage 2 (2025 - 2026)
 - Stage 3 (2026 - 2031)
 - Stage 4 (2032 - 2041)
- Future Publicly Accessible Open Space
 - Parkland Setting Development (inc. Publicly Accessible Open Space)
 - Publicly Accessible Open Space (Park)



Version Date & Time: 26/05/2021 08:33

Data Sources
QLD Government 2021, Brisbane City Council 2021

Disclaimer
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| Site Code | Project Code | Building / Development Name | Baseline Status | Change Type | EP Rate Source | | | EP Rate Group | EP Rate Units | Rate | Use Area | Footprint (m2) | Floors | Utilisation Factor | Calculated Area (m2) |
|-----------|--------------|--|-----------------|-------------|-------------------|-----|-------------------------------|-----------------|---------------|--------|----------|----------------|--------|--------------------|----------------------|
| P1 | P1 | P1 - Existing - Stage 4 - Low Impact Industry | Existing | Remove | SEQ WS&S D&C Code | QUU | Low Impact Industry | Non-Residential | m2 GFA | 0.0048 | | | | | |
| P1 | P1 | P1 - Future - Stage 4 - Education/Research | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (1 Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (2 Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (3+ Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P2 | P2 | P2 - Existing - Stage 3 - Commercial (Office) | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P2 | P2 | P2 - Future - Stage 3 - Commercial (Office) | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (1 Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (2 Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (3+ Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P3 | P3 | P3 - Existing - Stage 4 - Commercial (Office) | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P3 | P3 | P3 - Existing - Stage 4 - Community Purposes | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P3 | P3 | P3 - Existing - Stage 4 - Emergency Services | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P3 | P3 | P3 - Existing - Stage 4 - Health Care Service | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P3 | P3 | P3 - Future - Stage 4 - Commercial (Office) | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P4 | P4A | P4A - Existing - Stage 1 - Hotel Suite (1/2 Bed) | Existing | Remove | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P4 | P4A | P4A - Future - Stage 3 - Hotel Suite (1/2 Bed) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P4 | P4A | P4A - Existing - Stage 3 - Entertainment (Hotel) | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P4 | P4A | P4A - Future - Stage 3 - Entertainment (Hotel) | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P4 | P4B | P4B - Future - Stage 3 - Commercial (Retail) | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P4 | P4B | P4B - Future - Stage 3 - Entertainment (PMEA) | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Retail) | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Office) | Existing | Remove | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Retail) | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Office) | Future | Add | SEQ WS&S D&C Code | QUU | Retail, Commercial etc | Non-Residential | m2 GFA | 0.006 | | | | | |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (1 Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (2 Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (3+ Bedroom) | Future | Add | SEQ WS&S D&C Code | QUU | Residential Attached Dwelling | Residential | dwelling | 1.75 | | | | | |
| | | | | | | | | | | | | | | | |

| Site Code | Project Code | Building / Development Name | Manual Quantity | EP | Credit | Debit | Change | Attached Dwellings Equivalent | Commercial / Retail GFA | | Change Factor | EP Change | EP Change in | | Stage Code | Sewerage ADWF Rate (L/EP/day) | Sewerage ADWF (L/day) | Sewerage ADWF (L/s) | Sewerage ADWF Change (L/s) | Sewerage d | Sewerage Sanitary Flow Rate (L/EP/day) | |
|-----------|--------------|--|-----------------|----|--------|-------|--------|-------------------------------|-------------------------|------------|---------------|-----------|------------------|-----------------|------------|-------------------------------|-----------------------|---------------------|----------------------------|------------|--|-----|
| | | | | | | | | | (m2) | Equivalent | | | EP Change in GFA | Attached Dwells | | | | | | | | |
| P1 | P1 | P1 - Existing - Stage 4 - Low Impact Industry | 475 | | 2 | 2 | - | -2 | 1 | 333 | -1 | -2 | -333 | -1 | ST04 | 210 | | 420 | 0.00 | 0.00 | 7.80 | 150 |
| P1 | P1 | P1 - Future - Stage 4 - Education/Research | 82890 | | 497 | - | 497 | 497 | 284 | 82,833 | 1 | +497 | +82,833 | +284 | ST04 | 210 | 104,370 | 1.21 | 1.21 | 3.87 | 150 | |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (1 Bedroom) | 89 | | 156 | - | 156 | 156 | 89 | 26,000 | 1 | +156 | +26,000 | +89 | ST03 | 210 | 32,760 | 0.38 | 0.38 | 6.12 | 150 | |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (2 Bedroom) | 89 | | 156 | - | 156 | 156 | 89 | 26,000 | 1 | +156 | +26,000 | +89 | ST03 | 210 | 32,760 | 0.38 | 0.38 | 6.12 | 150 | |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (3+ Bedroom) | 20 | | 35 | - | 35 | 35 | 20 | 5,833 | 1 | +35 | +5,833 | +20 | ST03 | 210 | 7,350 | 0.09 | 0.09 | 7.73 | 150 | |
| P2 | P2 | P2 - Existing - Stage 3 - Commercial (Office) | 948 | | 6 | 6 | - | -6 | 3 | 1,000 | -1 | -6 | -1,000 | -3 | ST03 | 210 | 1,260 | 0.01 | -0.01 | 7.80 | 150 | |
| P2 | P2 | P2 - Future - Stage 3 - Commercial (Office) | 23939 | | 144 | - | 144 | 144 | 82 | 24,000 | 1 | +144 | +24,000 | +82 | ST03 | 210 | 30,240 | 0.35 | 0.35 | 6.28 | 150 | |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (1 Bedroom) | 292 | | 511 | - | 511 | 511 | 292 | 85,167 | 1 | +511 | +85,167 | +292 | ST04 | 210 | 107,310 | 1.24 | 1.24 | 3.85 | 150 | |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (2 Bedroom) | 292 | | 511 | - | 511 | 511 | 292 | 85,167 | 1 | +511 | +85,167 | +292 | ST04 | 210 | 107,310 | 1.24 | 1.24 | 3.85 | 150 | |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (3+ Bedroom) | 65 | | 114 | - | 114 | 114 | 65 | 19,000 | 1 | +114 | +19,000 | +65 | ST04 | 210 | 23,940 | 0.28 | 0.28 | 6.68 | 150 | |
| P3 | P3 | P3 - Existing - Stage 4 - Commercial (Office) | 35700 | | 214 | 214 | - | -214 | 122 | 35,667 | -1 | -214 | -35,667 | -122 | ST04 | 210 | 44,940 | 0.52 | -0.52 | 5.35 | 150 | |
| P3 | P3 | P3 - Existing - Stage 4 - Community Purposes | 6300 | | 38 | 38 | - | -38 | 22 | 6,333 | -1 | -38 | -6,333 | -22 | ST04 | 210 | 7,980 | 0.09 | -0.09 | 7.69 | 150 | |
| P3 | P3 | P3 - Existing - Stage 4 - Emergency Services | 5,682 | | 34 | 34 | - | -34 | 19 | 5,667 | -1 | -34 | -5,667 | -19 | ST04 | 210 | 7,140 | 0.08 | -0.08 | 7.75 | 150 | |
| P3 | P3 | P3 - Existing - Stage 4 - Health Care Service | 3600 | | 22 | 22 | - | -22 | 13 | 3,667 | -1 | -22 | -3,667 | -13 | ST04 | 210 | 4,620 | 0.05 | -0.05 | 7.80 | 150 | |
| P3 | P3 | P3 - Future - Stage 4 - Commercial (Office) | 104567 | | 627 | - | 627 | 627 | 358 | 104,500 | 1 | +627 | +104,500 | +358 | ST04 | 210 | 131,670 | 1.52 | 1.52 | 3.68 | 150 | |
| P4 | P4A | P4A - Existing - Stage 1 - Hotel Suite (1/2 Bed) | 191 | | 334 | 334 | - | -334 | 191 | 55,667 | -1 | -334 | -55,667 | -191 | ST01 | 210 | 70,140 | 0.81 | -0.81 | 4.14 | 150 | |
| P4 | P4A | P4A - Future - Stage 3 - Hotel Suite (1/2 Bed) | 357 | | 625 | - | 625 | 625 | 357 | 104,167 | 1 | +625 | +104,167 | +357 | ST03 | 210 | 131,250 | 1.52 | 1.52 | 3.68 | 150 | |
| P4 | P4A | P4A - Existing - Stage 3 - Entertainment (Hotel) | 3043 | | 18 | 18 | - | -18 | 10 | 3,000 | -1 | -18 | -3,000 | -10 | ST03 | 210 | 3,780 | 0.04 | -0.04 | 7.80 | 150 | |
| P4 | P4A | P4A - Future - Stage 3 - Entertainment (Hotel) | 16362 | | 98 | - | 98 | 98 | 56 | 16,333 | 1 | +98 | +16,333 | +56 | ST03 | 210 | 20,580 | 0.24 | 0.24 | 6.89 | 150 | |
| P4 | P4B | P4B - Future - Stage 3 - Commercial (Retail) | 4042 | | 24 | - | 24 | 24 | 14 | 4,000 | 1 | +24 | +4,000 | +14 | ST03 | 210 | 5,040 | 0.06 | 0.06 | 7.80 | 150 | |
| P4 | P4B | P4B - Future - Stage 3 - Entertainment (PMEA) | 57096 | | 343 | - | 343 | 343 | 196 | 57,167 | 1 | +343 | +57,167 | +196 | ST03 | 210 | 72,030 | 0.83 | 0.83 | 4.13 | 150 | |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Retail) | 6893 | | 41 | 41 | - | -41 | 23 | 6,833 | -1 | -41 | -6,833 | -23 | ST01 | 210 | 8,610 | 0.10 | -0.10 | 7.65 | 150 | |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Office) | 36,799 | | 221 | 221 | - | -221 | 126 | 36,833 | -1 | -221 | -36,833 | -126 | ST01 | 210 | 46,410 | 0.54 | -0.54 | 5.25 | 150 | |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Retail) | 11396 | | 68 | - | 68 | 68 | 39 | 11,333 | 1 | +68 | +11,333 | +39 | ST02 | 210 | 14,280 | 0.17 | 0.17 | 7.29 | 150 | |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Office) | 181656 | | 1,090 | - | 1,090 | 1,090 | 623 | 181,667 | 1 | +1,090 | +181,667 | +623 | ST02 | 210 | 228,900 | 2.65 | 2.65 | 3.29 | 150 | |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (1 Bedroom) | 471 | | 824 | - | 824 | 824 | 471 | 137,333 | 1 | +824 | +137,333 | +471 | ST03 | 210 | 173,040 | 2.00 | 2.00 | 3.51 | 150 | |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (2 Bedroom) | 471 | | 824 | - | 824 | 824 | 471 | 137,333 | 1 | +824 | +137,333 | +471 | ST03 | 210 | 173,040 | 2.00 | 2.00 | 3.51 | 150 | |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (3+ Bedroom) | 105 | | 184 | - | 184 | 184 | 105 | 30,667 | 1 | +184 | +30,667 | +105 | ST03 | 210 | 38,640 | 0.45 | 0.45 | 5.75 | 150 | |
| | | | | | 7,761 | 930 | 6,831 | 5,901 | 4,435 | 1,293,500 | | +5,901 | +983,500 | +3,372 | | | | 18.86 | 14.34 | | | |

| | | | Sewerage Groundwater Infiltration Rate (L/EP/day) | Sewerage PDWF (L/day) | Sewerage PDWF (L/s) | Sewerage PDWF Change (L/s) | Sewerage Rainfall Dependent Inflow (L/EP/day) | Sewerage PWWF (L/day) | Sewerage PWWF (L/s) | Sewerage PWWF Change (L/s) | Sewerage Catchment | Private PS Option Catchment | Sewerage Comments | NRW Demand Rate (L/EP/day) | Water NRW Demand (L/day) | Water NRW Demand (L/s) |
|-----------|--------------|--|---|--------------------------|------------------------|----------------------------------|---|--------------------------|------------------------|----------------------------------|-----------------------|-----------------------------------|-------------------|-------------------------------|-----------------------------|---------------------------|
| Site Code | Project Code | Building / Development Name | | | | | | | | | | | | | | |
| P1 | P1 | P1 - Existing - Stage 4 - Low Impact Industry | 30 | 2,400 | 0.03 | -0.03 | 360 | 3,120 | 0.04 | -0.04 | Catchment 2 | | | 30 | -60 | 0.00 |
| P1 | P1 | P1 - Future - Stage 4 - Education/Research | 30 | 303,543 | 3.51 | 3.51 | 360 | 482,463 | 5.58 | 5.58 | Catchment 2 | | | 30 | 14,910 | 0.17 |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (1 Bedroom) | 30 | 147,888 | 1.71 | 1.71 | 360 | 204,048 | 2.36 | 2.36 | Catchment 2 | | | 30 | 4,680 | 0.05 |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (2 Bedroom) | 30 | 147,888 | 1.71 | 1.71 | 360 | 204,048 | 2.36 | 2.36 | Catchment 2 | | | 30 | 4,680 | 0.05 |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (3+ Bedroom) | 30 | 41,650 | 0.48 | 0.48 | 360 | 54,250 | 0.63 | 0.63 | Catchment 2 | | | 30 | 1,050 | 0.01 |
| P2 | P2 | P2 - Existing - Stage 3 - Commercial (Office) | 30 | 7,200 | 0.08 | -0.08 | 360 | 9,360 | 0.11 | -0.11 | Catchment 2 | | | 30 | -180 | 0.00 |
| P2 | P2 | P2 - Future - Stage 3 - Commercial (Office) | 30 | 139,968 | 1.62 | 1.62 | 360 | 191,808 | 2.22 | 2.22 | Catchment 2 | | | 30 | 4,320 | 0.05 |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (1 Bedroom) | 30 | 310,305 | 3.59 | 3.59 | 360 | 494,265 | 5.72 | 5.72 | Catchment 1 | | | 30 | 15,330 | 0.18 |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (2 Bedroom) | 30 | 310,305 | 3.59 | 3.59 | 360 | 494,265 | 5.72 | 5.72 | Catchment 1 | | | 30 | 15,330 | 0.18 |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (3+ Bedroom) | 30 | 117,648 | 1.36 | 1.36 | 360 | 158,688 | 1.84 | 1.84 | Catchment 1 | | | 30 | 3,420 | 0.04 |
| P3 | P3 | P3 - Existing - Stage 4 - Commercial (Office) | 30 | 178,048 | 2.06 | -2.06 | 360 | 255,088 | 2.95 | -2.95 | Catchment 1 | | | 30 | -6,420 | -0.07 |
| P3 | P3 | P3 - Existing - Stage 4 - Community Purposes | 30 | 44,992 | 0.52 | -0.52 | 360 | 58,672 | 0.68 | -0.68 | Catchment 1 | | | 30 | -1,140 | -0.01 |
| P3 | P3 | P3 - Existing - Stage 4 - Emergency Services | 30 | 40,528 | 0.47 | -0.47 | 360 | 52,768 | 0.61 | -0.61 | Catchment 1 | | | 30 | -1,020 | -0.01 |
| P3 | P3 | P3 - Existing - Stage 4 - Health Care Service | 30 | 26,400 | 0.31 | -0.31 | 360 | 34,320 | 0.40 | -0.40 | Catchment 1 | | | 30 | -660 | -0.01 |
| P3 | P3 | P3 - Future - Stage 4 - Commercial (Office) | 30 | 364,679 | 4.22 | 4.22 | 360 | 590,399 | 6.83 | 6.83 | Catchment 1 | | | 30 | 18,810 | 0.22 |
| P4 | P4A | P4A - Existing - Stage 1 - Hotel Suite (1/2 Bed) | 30 | 217,601 | 2.52 | -2.52 | 360 | 337,841 | 3.91 | -3.91 | Catchment 1 | | | 30 | -10,020 | -0.12 |
| P4 | P4A | P4A - Future - Stage 3 - Hotel Suite (1/2 Bed) | 30 | 363,672 | 4.21 | 4.21 | 360 | 588,672 | 6.81 | 6.81 | Catchment 1 | | | 30 | 18,750 | 0.22 |
| P4 | P4A | P4A - Existing - Stage 3 - Entertainment (Hotel) | 30 | 21,600 | 0.25 | -0.25 | 360 | 28,080 | 0.33 | -0.33 | Catchment 1 | | | 30 | -540 | -0.01 |
| P4 | P4A | P4A - Future - Stage 3 - Entertainment (Hotel) | 30 | 104,272 | 1.21 | 1.21 | 360 | 139,552 | 1.62 | 1.62 | Catchment 1 | | | 30 | 2,940 | 0.03 |
| P4 | P4B | P4B - Future - Stage 3 - Commercial (Retail) | 30 | 28,800 | 0.33 | 0.33 | 360 | 37,440 | 0.43 | 0.43 | Catchment 2 | | | 30 | 720 | 0.01 |
| P4 | P4B | P4B - Future - Stage 3 - Entertainment (PMEA) | 30 | 222,693 | 2.58 | 2.58 | 360 | 346,173 | 4.01 | 4.01 | Catchment 2 | | | 30 | 10,290 | 0.12 |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Retail) | 30 | 48,298 | 0.56 | -0.56 | 360 | 63,058 | 0.73 | -0.73 | Catchment 1 | | | 30 | -1,230 | -0.01 |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Office) | 30 | 180,778 | 2.09 | -2.09 | 360 | 260,338 | 3.01 | -3.01 | Catchment 1 | | | 30 | -6,630 | -0.08 |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Retail) | 30 | 76,432 | 0.88 | 0.88 | 360 | 100,912 | 1.17 | 1.17 | Catchment 1 | | | 30 | 2,040 | 0.02 |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Office) | 30 | 570,888 | 6.61 | 6.61 | 360 | 963,288 | 11.15 | 11.15 | Catchment 1 | | | 30 | 32,700 | 0.38 |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (1 Bedroom) | 30 | 458,968 | 5.31 | 5.31 | 360 | 755,608 | 8.75 | 8.75 | Catchment 1 | | | 30 | 24,720 | 0.29 |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (2 Bedroom) | 30 | 458,968 | 5.31 | 5.31 | 360 | 755,608 | 8.75 | 8.75 | Catchment 1 | | | 30 | 24,720 | 0.29 |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (3+ Bedroom) | 30 | 164,128 | 1.90 | 1.90 | 360 | 230,368 | 2.67 | 2.67 | Catchment 1 | | | 30 | 5,520 | 0.06 |
| | | | | | 59.03 | 41.26 | | | 91.37 | 65.85 | | | | | | 2.05 |

| Site Code | Project Code | Building / Development Name | Water Metered | Water Metered | Water Metered AD Demand (L/s) | Water Total AD Demand (L/day) | Water Total AD Demand (L/s) | Peaking Factor Group | Water PD/AD Peaking Factor | Water Total PD Demand (L/day) | Water Total PD Demand (L/s) | Water PH/AD Peaking Factor | Water Total PH Demand (L/day) | Water Total PH Demand (L/s) |
|-----------|--------------|--|------------------------------|----------------------|----------------------------------|----------------------------------|--------------------------------|-----------------------|-------------------------------|----------------------------------|--------------------------------|-------------------------------|----------------------------------|--------------------------------|
| | | | AD Demand Rate (L/EP/day) | AD Demand (L/day) | | | | | | | | | | |
| P1 | P1 | P1 - Existing - Stage 4 - Low Impact Industry | 230 | -460 | -0.01 | -520 | -0.01 | Commercial/Industrial | 2 | -980 | -0.01 | 2.8 | -1,348 | -0.02 |
| P1 | P1 | P1 - Future - Stage 4 - Education/Research | 230 | 114,310 | 1.32 | 129,220 | 1.50 | Commercial/Industrial | 2 | 243,530 | 2.82 | 2.8 | 334,978 | 3.88 |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (1 Bedroom) | 230 | 35,880 | 0.42 | 40,560 | 0.47 | High Density Res | 2 | 76,440 | 0.88 | 3.5 | 130,260 | 1.51 |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (2 Bedroom) | 230 | 35,880 | 0.42 | 40,560 | 0.47 | High Density Res | 2 | 76,440 | 0.88 | 3.5 | 130,260 | 1.51 |
| P2 | P2 | P2 - Future - Stage 3 - Dwelling (3+ Bedroom) | 230 | 8,050 | 0.09 | 9,100 | 0.11 | High Density Res | 2 | 17,150 | 0.20 | 3.5 | 29,225 | 0.34 |
| P2 | P2 | P2 - Existing - Stage 3 - Commercial (Office) | 230 | -1,380 | -0.02 | -1,560 | -0.02 | Commercial/Industrial | 2 | -2,940 | -0.03 | 2.8 | -4,044 | -0.05 |
| P2 | P2 | P2 - Future - Stage 3 - Commercial (Office) | 230 | 33,120 | 0.38 | 37,440 | 0.43 | Commercial/Industrial | 2 | 70,560 | 0.82 | 2.8 | 97,056 | 1.12 |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (1 Bedroom) | 230 | 117,530 | 1.36 | 132,860 | 1.54 | High Density Res | 2 | 250,390 | 2.90 | 3.5 | 426,685 | 4.94 |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (2 Bedroom) | 230 | 117,530 | 1.36 | 132,860 | 1.54 | High Density Res | 2 | 250,390 | 2.90 | 3.5 | 426,685 | 4.94 |
| P3 | P3 | P3 - Future - Stage 4 - Dwelling (3+ Bedroom) | 230 | 26,220 | 0.30 | 29,640 | 0.34 | High Density Res | 2 | 55,860 | 0.65 | 3.5 | 95,190 | 1.10 |
| P3 | P3 | P3 - Existing - Stage 4 - Commercial (Office) | 230 | -49,220 | -0.57 | -55,640 | -0.64 | Commercial/Industrial | 2 | -104,860 | -1.21 | 2.8 | -144,236 | -1.67 |
| P3 | P3 | P3 - Existing - Stage 4 - Community Purposes | 230 | -8,740 | -0.10 | -9,880 | -0.11 | Commercial/Industrial | 2 | -18,620 | -0.22 | 2.8 | -25,612 | -0.30 |
| P3 | P3 | P3 - Existing - Stage 4 - Emergency Services | 230 | -7,820 | -0.09 | -8,840 | -0.10 | Commercial/Industrial | 2 | -16,660 | -0.19 | 2.8 | -22,916 | -0.27 |
| P3 | P3 | P3 - Existing - Stage 4 - Health Care Service | 230 | -5,060 | -0.06 | -5,720 | -0.07 | Commercial/Industrial | 2 | -10,780 | -0.12 | 2.8 | -14,828 | -0.17 |
| P3 | P3 | P3 - Future - Stage 4 - Commercial (Office) | 230 | 144,210 | 1.67 | 163,020 | 1.89 | Commercial/Industrial | 2 | 307,230 | 3.56 | 2.8 | 422,598 | 4.89 |
| P4 | P4A | P4A - Existing - Stage 1 - Hotel Suite (1/2 Bed) | 230 | -76,820 | -0.89 | -86,840 | -1.01 | High Density Res | 2 | -163,660 | -1.89 | 3.5 | -278,890 | -3.23 |
| P4 | P4A | P4A - Future - Stage 3 - Hotel Suite (1/2 Bed) | 230 | 143,750 | 1.66 | 162,500 | 1.88 | High Density Res | 2 | 306,250 | 3.54 | 3.5 | 521,875 | 6.04 |
| P4 | P4A | P4A - Existing - Stage 3 - Entertainment (Hotel) | 230 | -4,140 | -0.05 | -4,680 | -0.05 | Commercial/Industrial | 2 | -8,820 | -0.10 | 2.8 | -12,132 | -0.14 |
| P4 | P4A | P4A - Future - Stage 3 - Entertainment (Hotel) | 230 | 22,540 | 0.26 | 25,480 | 0.29 | Commercial/Industrial | 2 | 48,020 | 0.56 | 2.8 | 66,052 | 0.76 |
| P4 | P4B | P4B - Future - Stage 3 - Commercial (Retail) | 230 | 5,520 | 0.06 | 6,240 | 0.07 | Commercial/Industrial | 2 | 11,760 | 0.14 | 2.8 | 16,176 | 0.19 |
| P4 | P4B | P4B - Future - Stage 3 - Entertainment (PMEA) | 230 | 78,890 | 0.91 | 89,180 | 1.03 | Commercial/Industrial | 2 | 168,070 | 1.95 | 2.8 | 231,182 | 2.68 |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Retail) | 230 | -9,430 | -0.11 | -10,660 | -0.12 | Commercial/Industrial | 2 | -20,090 | -0.23 | 2.8 | -27,634 | -0.32 |
| P5 | P5A | P5A - Existing - Stage 1 - Commercial (Office) | 230 | -50,830 | -0.59 | -57,460 | -0.67 | Commercial/Industrial | 2 | -108,290 | -1.25 | 2.8 | -148,954 | -1.72 |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Retail) | 230 | 15,640 | 0.18 | 17,680 | 0.20 | Commercial/Industrial | 2 | 33,320 | 0.39 | 2.8 | 45,832 | 0.53 |
| P5 | P5A | P5A - Future - Stage 2 - Commercial (Office) | 230 | 250,700 | 2.90 | 283,400 | 3.28 | Commercial/Industrial | 2 | 534,100 | 6.18 | 2.8 | 734,660 | 8.50 |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (1 Bedroom) | 230 | 189,520 | 2.19 | 214,240 | 2.48 | High Density Res | 2 | 403,760 | 4.67 | 3.5 | 688,040 | 7.96 |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (2 Bedroom) | 230 | 189,520 | 2.19 | 214,240 | 2.48 | High Density Res | 2 | 403,760 | 4.67 | 3.5 | 688,040 | 7.96 |
| P5 | P5B | P5B - Future - Stage 2 - Dwelling (3+ Bedroom) | 230 | 42,320 | 0.49 | 47,840 | 0.55 | High Density Res | 2 | 90,160 | 1.04 | 3.5 | 153,640 | 1.78 |
| | | | | | 15.71 | | 17.76 | | | | 33.47 | | | 52.75 |

Attachment B Netserv Plan Extract

SCHEDULE 8 SCHEDULE OF WORKS

SC8.1 Water supply network schedule of works

SC8.1.1 Water supply network schedule of works (Brisbane)

Table SC8.1.1 Water supply network schedule of works (Brisbane)

| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|---------------|---|------------|--------------------|
| 6 | FP-NPA-0005 | 1,293m of 300dia watermain | 2022 | \$2,510,741 |
| 6 | FP-NPA-0006 | 467m of 200dia watermain | 2021 | \$671,475 |
| 10 | FP-MHS-0001 | 607m of 300dia watermain | 2018 | \$1,178,669 |
| 11 | FP-ASP-0002 | Between Grant and Sarah Streets, Zillmere Water Trunk Main Railway Crossing | 2036 | \$174,993 |
| 12 | FP-ASP-0001 | 1,685m of 450dia watermain | 2036 | \$5,144,261 |
| 17 | FP-SPH-0002 | 4m of 300dia watermain | 2017 | \$7,767 |
| 17 | FP-SPH-0007 | 103m of 250dia watermain | 2021 | \$170,146 |
| 17 | FP-SPH-0123 | 109m of 250dia watermain | 2021 | \$180,058 |
| 17 | FP-SPH-0124 | 49m of 250dia watermain | 2021 | \$80,943 |
| 17 | FP-SPH-0125 | 72m of 250dia watermain | 2021 | \$118,937 |
| 17 | FP-SPH-0126 | 107m of 250dia watermain | 2021 | \$176,754 |
| 17 | FP-SPH-0204 | Hamilton Road from Webster Road to Curwen Terrace Water Trunk Main | 2031 | \$650,000 |
| 17 | FP-SPH-0206 | | | |
| 17 | FP-SPH-0205 | Hamilton Road, Curwen Terrace to Farnell Street Water Trunk Main | 2036 | \$950,000 |
| 17 | FP-SPH-0207 | | | |
| 17 | FP-SPH-0212 | | | |
| 17 | FP-SPH-0213 | 10m of 250dia watermain | 2021 | \$16,519 |
| 17 | FP-SPH-0214 | 24m of 250dia watermain | 2021 | \$39,646 |
| 17 | FP-SPH-0358 | Stafford Road up to Ogden / Cockle Street to Cutbush Road Water Trunk Main | 2036 | \$542,000 |
| 17 | FP-SPH-0359 | | | |
| 17 | FP-SPH-0360 | | | |
| 17 | FP-SPH-0361 | 352m of 300dia watermain | 2036 | \$683,512 |
| 17 | FP-SPH-0362 | 13m of 300dia watermain | 2036 | \$25,243 |
| 19 | FP-BRH-0002 | 2,061m of 250dia watermain | 2020 | \$3,404,575 |
| 24 | FP-MHS-0002 | 27m of 200dia watermain | 2019 | \$38,822 |
| 24 | FP-MHS-0003 | 28m of 200dia watermain | 2021 | \$40,260 |
| 24 | FP-SPH-0006 | 9m of 300dia watermain | 2017 | \$17,476 |
| 24 | FP-SPH-0305 | 29m of 300dia watermain | 2021 | \$56,312 |
| 24 | FP-SPH-0307 | 153m of 300dia watermain | 2021 | \$297,095 |
| 24 | FP-SPH-0308 | Gympie Road, Kuran Street to Kitchener Road Water Trunk Main | 2031 | \$1,340,000 |
| 24 | FP-SPH-0309 | 11m of 300dia watermain | 2021 | \$21,360 |
| 24 | FP-SPH-0310 | 40m of 300dia watermain | 2021 | \$77,672 |
| 24 | FP-SPH-0311 | 13m of 300dia watermain | 2021 | \$25,243 |
| 24 | FP-SPH-0312 | 24m of 300dia watermain | 2021 | \$46,603 |
| 24 | FP-SPH-0313 | 31m of 300dia watermain | 2021 | \$60,196 |
| 24 | FP-SPH-0314 | 13m of 300dia watermain | 2021 | \$25,243 |
| 24 | FP-SPH-0315 | 68m of 300dia watermain | 2021 | \$132,042 |

| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|---------------|--|------------|--------------------|
| 24 | FP-SPH-0316 | 5m of 300dia watermain | 2021 | \$9,709 |
| 24 | FP-SPH-0317 | 7m of 300dia watermain | 2021 | \$13,593 |
| 24 | FP-SPH-0319 | 26m of 300dia watermain | 2021 | \$50,487 |
| 24 | FP-SPH-0320 | 78m of 300dia watermain | 2021 | \$151,460 |
| 24 | FP-SPH-0324 | Stafford Road up to Ogden/ Cockle Street Water Trunk Main | 2036 | \$131,000 |
| 24 | FP-SPH-0325 | 110m of 300dia watermain | 2036 | \$213,597 |
| 24 | FP-SPH-0326 | Gympie Road, Kuran Street to Kitchener Road Water Trunk Main | 2031 | \$1,340,000 |
| 24 | FP-SPH-0327 | 66m of 300dia watermain | 2036 | \$128,158 |
| 24 | FP-SPH-0328 | 58m of 300dia watermain | 2036 | \$112,624 |
| 24 | FP-SPH-0329 | 193m of 300dia watermain | 2036 | \$374,766 |
| 24 | FP-SPH-0330 | 43m of 300dia watermain | 2021 | \$83,497 |
| 24 | FP-SPH-0331 | 6m of 300dia watermain | 2036 | \$11,651 |
| 24 | FP-SPH-0332 | 9m of 250dia watermain | 2021 | \$14,867 |
| 24 | FP-SPH-0333 | 26m of 250dia watermain | 2021 | \$42,950 |
| 24 | FP-SPH-0334 | 58m of 250dia watermain | 2021 | \$95,810 |
| 24 | FP-SPH-0373 | Gympie Road, Kuran Street to Kitchener Road Water Trunk Main | 2031 | \$1,340,000 |
| 24 | FP-SPH-0374 | | | |
| 25 | FP-ELH-0023 | 22m of 300dia watermain | 2041 | \$42,719 |
| 25 | FP-ELH-0023 | 172m of 300dia watermain | 2041 | \$333,989 |
| 25 | FP-ELH-0023 | 28m of 300dia watermain | 2041 | \$54,370 |
| 25 | FP-ELH-0023 | 58m of 300dia watermain | 2041 | \$112,624 |
| 25 | FP-ELH-0023 | 100m of 300dia watermain | 2041 | \$194,179 |
| 25 | FP-ELH-0023 | 91m of 300dia watermain | 2041 | \$176,703 |
| 25 | FP-ELH-0023 | 89m of 300dia watermain | 2041 | \$172,820 |
| 25 | FP-ELH-0023 | 48m of 300dia watermain | 2041 | \$93,206 |
| 25 | FP-ELH-0023 | 119m of 300dia watermain | 2041 | \$231,074 |
| 25 | FP-ELH-0023 | 130m of 300dia watermain | 2041 | \$252,433 |
| 25 | FP-ELH-0023 | 36m of 300dia watermain | 2041 | \$69,905 |
| 25 | FP-ELH-0023 | 96m of 300dia watermain | 2041 | \$186,412 |
| 25 | FP-ELH-0023 | 79m of 300dia watermain | 2041 | \$153,402 |
| 25 | FP-ELH-0023 | 90m of 300dia watermain | 2041 | \$174,762 |
| 25 | FP-SPH-0011 | 8m of 300dia watermain | 2017 | \$15,534 |
| 25 | FP-SPH-0020 | 131m of 200dia watermain | 2008 | \$188,358 |
| 25 | FP-SPH-0024 | 21m of 200dia watermain | 2008 | \$30,195 |
| 25 | FP-SPH-0030 | 16m of 300dia watermain | 2017 | \$31,069 |
| 30 | FP-TGP-0003 | 296m of 300dia watermain | 2020 | \$574,771 |
| 32 | FP-BOH-0003 | 673m of 250dia watermain | TBD | \$1,111,732 |
| 32 | FP-BRH-0054 | 559m of 200dia watermain | 2016 | \$803,758 |
| 32 | FP-ELH-0001 | 152m of 300dia watermain | 2014 | \$295,153 |
| 32 | FP-ELH-0014 | 14m of 300dia watermain | 2014 | \$27,185 |
| 32 | FP-ELH-0022 | 31m of 300dia watermain | 2041 | \$60,196 |
| 32 | FP-ELH-0022 | 12m of 300dia watermain | 2041 | \$23,302 |
| 32 | FP-ELH-0022 | 73m of 300dia watermain | 2041 | \$141,751 |
| 32 | FP-ELH-0022 | 194m of 300dia watermain | 2041 | \$376,708 |

| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|----------------|--|------------|--------------------|
| 32 | FP-ELH-0022 | 92m of 300dia watermain | 2041 | \$178,645 |
| 32 | FP-ELH-0024 | 18m of 200dia watermain | 2020 | \$25,881 |
| 38 | FP-TGP-0004 | 188m of 450dia watermain | 2020 | \$573,959 |
| 40 | FP-BOH-0004 | 135m of 250dia watermain | TBD | \$223,007 |
| 40 | FP-BOH-0005 | 356m of 250dia watermain | TBD | \$588,078 |
| 40 | FP-BOH-0006 | 172m of 200dia watermain | TBD | \$247,310 |
| 41 | FP-WLH-0338 | 7m of 200dia watermain | 2022 | \$10,065 |
| 41 | FP-WLH-0401 | 408m of 300dia watermain | 2022 | \$792,252 |
| 46 | FP-GRH-0192 | 195m of 200dia watermain | 2014 | \$280,381 |
| 46 | FP-MCN-0013 | 64m of 300dia watermain | 2018 | \$124,275 |
| 46 | FP-TRR-0001 | Montague Road Trunk Main Augmentation – Stage 2 | 2021 | \$4,630,000 |
| 46 | FP-TRR-0002 | | | |
| 46 | FP-TRR-0122 | 15m of 200dia watermain | 2026 | \$21,568 |
| 47 | FP-TRR-0061 | 21m of 200dia watermain | 2021 | \$30,195 |
| 47 | FP-TRR-0072 | 16m of 200dia watermain | 2021 | \$23,006 |
| 47 | FP-TRR-0112 | Augmentation and Replacement mains in Logan Road/Regent Street, Woolloongabba | 2027 | \$139,461 |
| 52 | FP-FIR-0530-01 | 603m of 300dia watermain | 2021 | \$1,170,902 |
| 53 | FP-FIR-0524-01 | 13m of 200dia watermain | 2021 | \$18,692 |
| 53 | FP-MCN-0012 | 281m of 375dia watermain | 2018 | \$676,099 |
| 53 | FP-MCN-0021 | 290m of 200dia watermain | 2018 | \$416,976 |
| 53 | FP-MCN-0022 | 96m of 200dia watermain | 2018 | \$138,033 |
| 53 | FP-MCN-0024 | 5m of 300dia watermain | 2018 | \$9,709 |
| 53 | FP-MCN-0037 | 98m of 375dia watermain | 2018 | \$235,792 |
| 54 | FP-MCN-0001 | 50m of 200dia watermain | 2018 | \$71,892 |
| 55 | FP-TRR-0113 | Augmentation and Replacement mains in Logan Road/ Regent Street, Woolloongabba | 2027 | \$139,461 |
| 55 | FP-TRR-0114 | | | |
| 55 | FP-TRR-0115 | | | |
| 55 | FP-TRR-0116 | | | |
| 55 | FP-TRR-0121 | 49m of 250dia watermain | 2041 | \$80,943 |
| 59 | FP-MCN-0002 | 163m of 300dia watermain | 2018 | \$316,513 |
| 59 | FP-MCN-0006 | 2m of 300dia watermain | 2018 | \$3,884 |
| 59 | FP-MCN-0011 | 192m of 300dia watermain | 2018 | \$372,825 |
| 59 | FP-MCN-0034 | 1m of 300dia watermain | 2018 | \$1,942 |
| 65 | FP-MCN-0025 | 283m of 450dia watermain | 2011 | \$863,992 |
| 65 | FP-MCN-0026 | 441m of 450dia watermain | 2016 | \$1,346,361 |
| 65 | FP-MCN-0027 | 11m of 300dia watermain | 2018 | \$21,360 |
| 65 | FP-MCN-0044 | 1,009m of 250dia watermain | 2021 | \$1,666,772 |
| 65 | FP-MCN-0047 | 399m of 300dia watermain | 2018 | \$774,776 |
| 66 | FP-MTO-0003 | 25m of 300dia watermain | 2018 | \$48,545 |
| 67 | FP-MTO-0021 | 81m of 250dia watermain | 2018 | \$133,804 |
| 70 | FP-MGH-0006 | 58m of 200dia watermain | 2021 | \$83,395 |
| 73 | FP-MTO-0034 | 1,585m of 200dia watermain | 2018 | \$2,278,990 |
| 73 | FP-MTO-0041 | 1,077m of 200dia watermain | 2018 | \$1,548,563 |
| 75 | FP-MCS-BW011 | 17m of 250dia watermain | 2019 | \$28,082 |
| 76 | FP-ACR-5001 | 87m of 250dia watermain | 2020 | \$143,716 |

| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|----------------|----------------------------|------------|--------------------|
| 76 | FP-ACR-5002 | 116m of 200dia watermain | 2020 | \$166,790 |
| 76 | FP-ACR-5003 | 118m of 200dia watermain | 2020 | \$169,666 |
| 77 | FP-MGH-0005 | 24m of 300dia watermain | 2021 | \$46,603 |
| 80 | FP-ACR-0001-04 | 1,370m of 300dia watermain | 2020 | \$2,660,259 |
| 80 | FP-ACR-0005-01 | 16m of 300dia watermain | 2036 | \$31,069 |
| 80 | FP-ACR-0005-02 | 410m of 300dia watermain | 2036 | \$796,136 |
| 80 | FP-ACR-0005-03 | 327m of 300dia watermain | 2036 | \$634,967 |
| 80 | FP-ACR-0005-04 | 224m of 300dia watermain | 2036 | \$434,962 |
| 80 | FP-ACR-0006 | 119m of 300dia watermain | 2036 | \$231,074 |
| 80 | FP-ACR-0008 | 424m of 200dia watermain | 2036 | \$609,648 |
| 81 | FP-ACR-0001-01 | 11m of 300dia watermain | 2020 | \$21,360 |
| 81 | FP-ACR-0001-02 | 4m of 300dia watermain | 2020 | \$7,767 |
| 81 | FP-ACR-0001-03 | 109m of 300dia watermain | 2020 | \$211,656 |

SC8.2 Wastewater network schedule of works

SC8.2.1 Wastewater network schedule of works (Brisbane)

Table SC8.2.1 Wastewater supply network schedule of works (Brisbane)

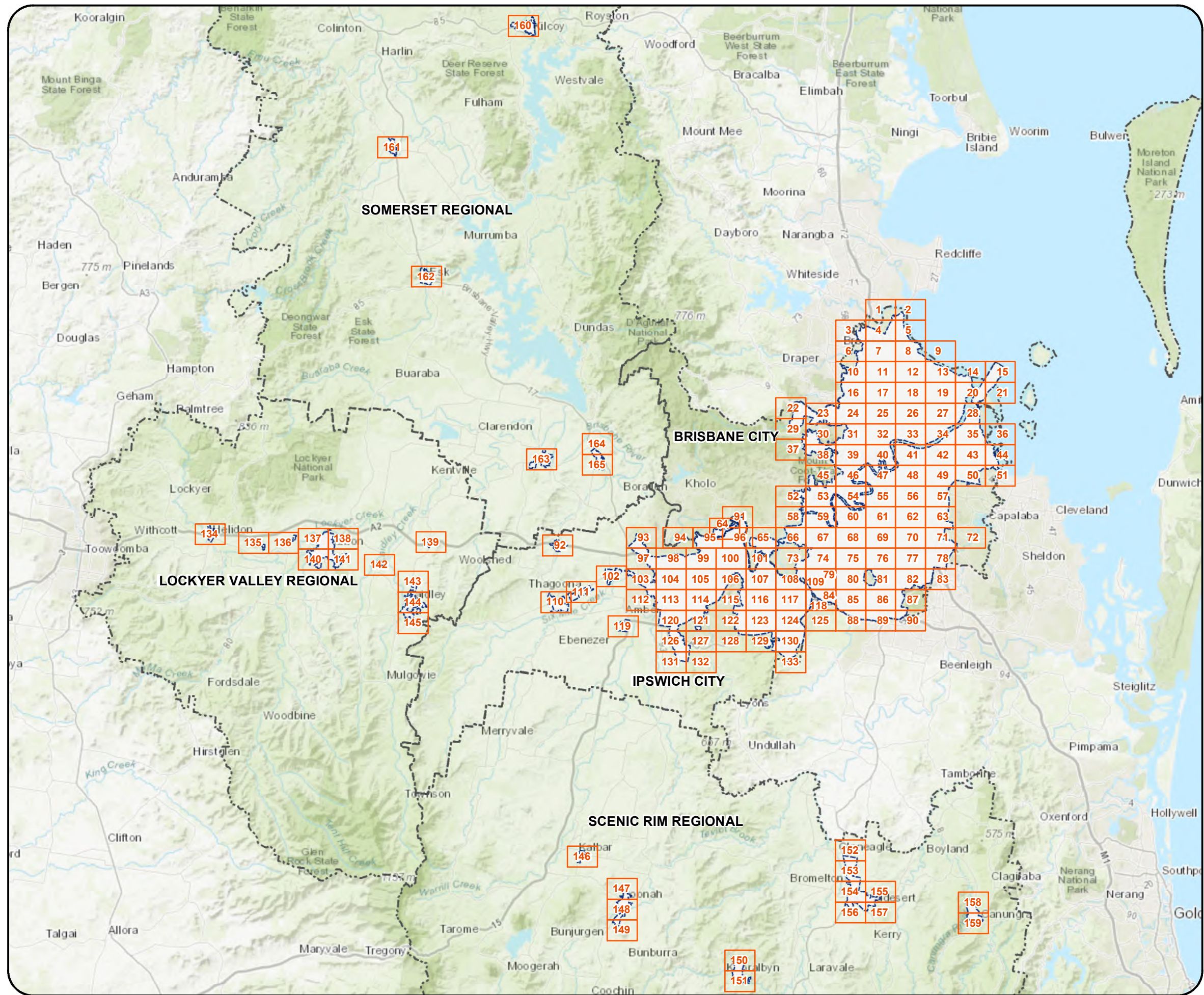
| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|-------------------|---|------------|--------------------|
| 6 | S5-GM-002 | SP185 Redirection | 2016 | \$150,194 |
| 7 | S5-GM15c | Telegraph Road branch off Fitzgibbon-Bracken Ridge | 2021 | \$471,235 |
| 7 | S5-GM16 | New Development area Fitzgibbon | 2021 | \$132,877 |
| 7 | S5-GM17 | U/S Fitzgibbon Sub Main Sec 1 – Roghan Road – Fitzgibbon | 2021 | \$115,732 |
| 7 | S5-GM20 | Branch off Taigum Sub Main – Taigum | 2021 | \$123,447 |
| 11 | S5-GM-001 | Little Cabbage Tree Creek Sub Main Augmentation | 2024 | \$1,195,318 |
| 11 | S5-GM-003 | 150mm sewer upstream Gayford Street | 2022 | \$39,469 |
| 11 | S5-GM-004 | SP217 redirection sewers | 2026 | \$246,386 |
| 11 | S5-GM-005 | SP37 Redirection | 2021 | \$420,079 |
| 17 | S1-2014-FGP-0003 | Augmentation with a 375/450mm sewer in Hamilton Road, Chermside | 2031 | \$1,755,503 |
| 17 | S1-2014-FGP-0004A | Augmentation with a 500mm sewer in Kittyhawk Road, Chermside | 2031 | \$1,599,273 |
| 17 | S1-2014-FGP-0004B | Augmentation with a 375mm sewer in Thomas/Kuran Street, Chermside | 2031 | \$1,191,420 |
| 17 | S1-2014-FGP-0004C | Augmentation with a 375mm sewer in Thomas/Kuran Street, Chermside | 2031 | \$359,342 |
| 17 | S1-2014-FGP-0099 | Arcola Street Sewer, Aspley | 2026 | \$326,712 |
| 18 | S1-2014-FGP-0007 | Augmentation with a 300mm sewer in Weyba Street, Banyo | 2026 | \$619,098 |
| 18 | S1-2014-FGP-0009 | Virginia Branch Sewer Section 1 Augmentation | 2026 | \$8,293,583 |
| 18 | S1-2014-FGP-0010 | Augmentation of Banyo Sub Main with a 675/600mm sewer in Earnshaw Road, Northgate | 2024 | \$5,986,958 |
| 18 | S1-2014-FGP-0011A | Virginia Branch Sewer Section 2 Augmentation | 2026 | \$30,437,122 |
| 18 | S1-2014-FGP-1003 | Augmentation with a 300mm sewer in Hurricane Street, Banyo | 2035 | \$202,665 |
| 18 | S1-2014-FGP-1075 | Augmentation with a 300mm sewer in Weyba Street, Banyo | 2026 | \$178,393 |
| 23 | S1-2014-FGP-0034 | Augmentation with a 300mm sewer in Arbor Street, Ferny Grove | 2028 | \$1,193,905 |
| 25 | S1-2014-FGP-0101 | Stage 1 Augmentation of Woolloowin Sub Main with a 300mm sewer | 2024 | \$1,733,219 |
| 25 | S1-2014-FGP-0101B | Stage 2 Augmentation of Woolloowin Sub Main with a 300mm sewer | 2024 | \$2,389,686 |
| 26 | S1-2014-FGP-0011B | Virginia Branch Sewer Section 2 Augmentation | 2026 | \$28,961,383 |
| 26 | S1-2014-FGP-0012 | Augmentation with a 300mm sewer in Hedley Avenue, Nundah | 2023 | \$1,287,806 |
| 26 | S1-2014-FGP-0013 | Augmentation of South Kedron Brooke Sewer with a 600mm sewer | 2026 | \$8,766,797 |

| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|-------------------|--|------------|--------------------|
| 26 | S1-2014-FGP-0014 | Augmentation of North Kedron Brooke Sewer with a 1200mm sewer | 2022 | \$42,459,537 |
| 26 | S1-2014-FGP-0102 | 375mm South Kedron Brook Sewer cross connection to NKBS | 2023 | \$1,885,548 |
| 26 | S1-2014-FGP-1014 | Augmentation of South Kedron Brooke Sewer with a 600mm sewer | 2026 | \$3,676,788 |
| 32 | S1-2014-FGP-0015B | S1 Tunnel Extension to Eagle Farm Pump Station, Hamilton – B | 2029 | \$96,000,000 |
| 32 | S1-2014-FGP-0037 | Windsor Sub Main Augmentation with a 375mm sewer | 2026 | \$1,638,893 |
| 32 | S1-2014-FGP-0037B | Windsor Sub Main Augmentation with a 375mm sewer | 2026 | \$3,800,290 |
| 32 | S1-2014-FGP-0038 | SP23 Edmonstone Street pump station inlet sewer, Newmarket | 2022 | \$2,090,847 |
| 32 | S1-2014-FGP-0104 | Main sewer connection U/S of Edmonstone Pump Station (SP23), Newmarket. | 2022 | \$146,427 |
| 32 | S1-2014-FGP-1999 | Augmentation of Breakfast Creek Main | 2023 | \$10,663,179 |
| 33 | S1-2014-FGP-0015 | S1 Tunnel Extension to Eagle Farm Pump Station, Hamilton – A | 2026 | \$164,871,000 |
| 33 | S1-2014-FGP-0018 | Hamilton Siphon Upgrades | 2031 | \$5,285,000 |
| 33 | S1-2014-FGP-0021 | Sewer Upgrade from Caswell Street SPS to Hamilton Siphon | 2023 | \$93,995,000 |
| 34 | S3-2016-FRM-0008 | Augmented Rising Main for SP49 | 2017 | \$1,237,091 |
| 35 | S4-2019-GM-002 | Lower Wynnum Main Sewer Augmentation | 2031 | \$5,050,000 |
| 39 | CBD-206-GM-0032 | Railway Terrace, Milton Sewer Upgrade (Aug Walsh McDougall Street) | 2021 | \$1,936,000 |
| 39 | S1-2014-FGP-1028 | Augmentation of Castlemaine Street and Cribb Street sewers | 2024 | \$6,602,000 |
| 39 | S1-2014-FGP-1037 | Augmentation with a 300mm sewer in Carraway Street, Kelvin Grove | 2026 | \$68,406 |
| 40 | CBD-2016-GM-0009 | Augmentation of Morgan Street sewers | 2020 | \$1,466,000 |
| 40 | CBD-2016-GM-0011 | Augmentation of Bowen Terrace and Brunswick Street sewers | 2024 | \$1,623,000 |
| 40 | CBD-2016-GM-0012 | Augmentation of sewers at intersection of Commercial Road and Ann Street | 2024 | \$1,227,000 |
| 40 | CBD-2016-GM-0013 | Augmentation of Wyandra Street sewers | 2024 | \$1,041,000 |
| 40 | CBD-2016-GM-0014 | Augmentation of Helen Street sewers | 2024 | \$1,082,000 |
| 40 | CBD-2016-GM-0015 | Augmentation of Commercial Road sewers | 2024 | \$1,272,000 |
| 40 | CBD-2016-GM-0016 | Augmentation of May Street sewers | 2026 | \$1,217,000 |
| 40 | CBD-2016-GM-0017 | Augmentation of Queens Street sewers | 2026 | \$758,000 |
| 40 | CBD-2016-GM-0018 | Wickham Street Interceptor Stage 2 – Ballow Street sewer | 2021 | \$1,955,000 |
| 40 | CBD-2016-GM-0022 | Augmentation of Doggett Street sewer | 2031 | \$325,000 |




| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|-------------------|---|------------|--------------------|
| 40 | CBD-2016-GM-0024 | Augmentation of Perry Lane sewers | 2036 | \$1,306,000 |
| 40 | CBD-2016-GM-0025 | | | |
| 40 | CBD-2016-GM-0033 | Augmentation of Astor Terrace and Wickham Street sewers | 2023 | \$3,019,000 |
| 40 | CBD-2016-GM-0035 | Wickham Street Interceptor Sewer Stage 1 | 2021 | \$9,403,000 |
| 40 | CBD-2016-GM-0036 | Augmentation of Alfred-Constance Street sewers | 2021 | \$2,444,000 |
| 40 | CBD-2016-GM-0037 | Augmentation of Longland Street sewer to S1 main | 2021 | \$2,284,000 |
| 40 | CBD-2016-GM-0052 | Augmentation of Water Street sewers Stage 2 | 2021 | \$11,085,000 |
| 40 | CBD-2016-GM-0053 | | | |
| 40 | S1-2014-FGP-0040A | Augmentation of Herston Branch Sewer | 2025 | \$211,956 |
| 40 | S1-2014-FGP-1000 | Augmentation of Breakfast Creek Main | 2023 | \$15,889,723 |
| 40 | S1-2014-FGP-1009 | Augmentation with a 225mm sewer in Bowen Bridge Road Bowen Hills | 2031 | \$633,705 |
| 40 | S1-2014-FGP-1010 | Augmentation with a 225mm sewer in Herston Road | 2026 | \$118,779 |
| 40 | S1-2014-FGP-1038 | Augmentation with a 300mm sewer near Inner City Bypass | 2031 | \$945,619 |
| 40 | S1-2014-FGP-1039 | Augmentation with a 325mm sewer in Gilchrist Avenue, Herston | 2026 | \$672,553 |
| 40 | S1-2014-FGP-1067 | Augmentation with a 450mm sewer in Campbell Street Bowen Hills | 2026 | \$819,352 |
| 41 | S1-2014-FGP-0020 | Perrin Creek Sub Main augmentation with 600mm sewer-Stage 1 | 2022 | \$5,310,000 |
| 41 | S1-2014-FGP-0023 | Augmentation of Stewart to Bilyana Street sewer d/s of Barramul Street PS. Morningside. | 2024 | \$1,713,083 |
| 41 | S1-2014-FGP-0026 | Augmentation of Jenolan Avenue Sewer, Hawthorne | 2026 | \$2,502,258 |
| 41 | S1-2014-FGP-0103 | Perrin Creek Sub Main augmentation with 600mm sewer- Stage 2 | 2024 | \$6,910,000 |
| 41 | S1-2014-FGP-1005 | Augmentation with a 225mm sewer near Algoori Street, Morningside | 2026 | \$757,830 |
| 41 | S1-2014-FGP-1042 | Augmentation with a 375mm sewer in Beverley Street, Morningside | 2035 | \$1,021,698 |
| 41 | S1-2014-FGP-1068 | Augmentation with a 300mm sewer near Stuart Street, Bulimba | 2026 | \$995,918 |
| 42 | S3-2016-FGP-0003 | Bulimba Creek Trunk Sewer Augmentation (Stage 3) | 2036 | \$78,583,035 |
| 42 | S3-2016-FGP-0047 | Model indicates SP258 is under capacity, replaces with gravity sewer. | 2025 | \$8,121,991 |
| 43 | S4-2019-GM-001 | Upper Wynnum Main Sewer Augmentation | 2021 | \$3,200,000 |

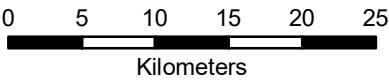
| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|------------------|--|------------|--------------------|
| 46 | CBD_2016_GM_0001 | Augmentation of Montague Road and Bank Street sewers | 2022 | \$1,948,000 |
| 46 | CBD_2016_GM_0002 | | | |
| 46 | CBD_2016_GM_0003 | | | |
| 46 | CBD_2016_GM_0006 | Augmentation of Sylvan Road sewers | 2021 | \$6,038,000 |
| 46 | CBD-2016-GM-0019 | Augmentation of Montague Road sewers | 2031 | \$1,666,000 |
| 46 | CBD-2016-GM-0021 | Augmentation of Ferry Road sewers | 2031 | \$1,353,000 |
| 46 | CBD-2016-GM-0023 | Augmentation of Kurilpa Street sewers | 2036 | \$1,145,000 |
| 46 | CBD-2016-GM-0031 | Extension of DN800 sewers along Lissner and Bennet Streets | 2021 | \$7,390,000 |
| 46 | CBD-2016-GM-0041 | West End Sub-Main Augmentation Stage 1 (Riverside Drive Phase 1) | 2022 | \$7,236,000 |
| 46 | CBD-2016-GM-0043 | Augmentation of Jane Street sewers | 2022 | \$1,028,000 |
| 46 | S1-2014-FGP-0087 | Brisbane Street Sewer upgrade, d/s of SP99, Toowong | 2031 | \$268,392 |
| 46 | S1-2014-FGP-0091 | Augmentation of Inlet sewer u/s of Heroes Avenue SP103, Taringa | 2023 | \$174,521 |
| 46 | S1-2014-FGP-0117 | Augmentation of Patrick Lane sewer | 2025 | \$1,604,000 |
| 46 | S1-2014-FGP-0119 | Brisbane Street Sewer upgrade, d/s of SP99, Toowong | 2031 | \$152,567 |
| 46 | S1-2014-FGP-1012 | Augmentation with a 375mm sewer in Macquarie Street, St Lucia | 2025 | \$1,277,123 |
| 46 | S1-2014-FGP-1027 | Augmentation with a 500mm sewer in Macquarie Street, St Lucia | 2025 | \$30,046 |
| 46 | S1-2014-FRP-0003 | Rising main upgrade from Brisbane Street PS SP99, Toowong. | 2031 | \$218,754 |
| 47 | CBD_2016_GM_0004 | Augmentation of Boundary Street sewers | 2024 | \$703,000 |
| 47 | CBD_2016_GM_0005 | Augmentation of Ernest Street sewers | 2028 | \$325,000 |
| 47 | CBD_2016_GM_0007 | | | |
| 47 | CBD_2016_GM_0008 | Augmentation of Margaret Street sewers | 2023 | \$1,847,000 |
| 47 | CBD-2016-GM-0020 | Augmentation of Hope Street sewers | 2031 | \$866,000 |
| 47 | CBD-2016-GM-0026 | Augmentation of Jurgens Street sewers | 2036 | \$1,874,000 |
| 47 | CBD-2016-GM-0034 | Augmentation of Albert Street sewers via Eliz St diversion sewer | 2021 | \$6,800,000 |
| 47 | CBD-2016-GM-0039 | Augmentation of Rawlins Street sewer | 2021 | \$2,678,000 |
| 47 | CBD-2016-GM-0040 | | | |

| Map Number | Map Reference | Description | Est Timing | Establishment Cost |
|------------|-------------------|---|------------|--------------------|
| 47 | CBD-2016-RM-0038 | Augmentation of Kangaroo Point Sub-Main | 2024 | \$6,513,000 |
| 47 | S1-2014-FGP-1026 | Augmentation with a 375mm sewer near Gladstone Street, Coopers | 2023 | \$2,913,588 |
| 47 | S1-2014-FGP-1052 | Augmentation with a 150mm sewer in Brook Street, South Brisbane | 2024 | \$2,082,000 |
| 48 | S1-2014-FGP-0028 | Augmentation of Ferguson Road Sewer, Seven Hills | 2026 | \$1,124,276 |
| 50 | S3-2016-FGP-0005 | Augmentation U/S of SP258. Planned bypass of SPS. | 2025 | \$1,399,739 |
| 54 | S1-2014-FGP-0093 | Augmentation of Carmody Street Branch, St Lucia | 2023 | \$1,780,000 |
| 54 | S1-2014-FGP-1001 | Augmentation with a 400mm sewer in College Road, St Lucia | 2022 | \$1,458,084 |
| 55 | S1-2014-FGP-0033 | Augmentation with 300mm sewer in Cedar Street, Greenslopes | 2024 | \$1,195,169 |
| 55 | S1-2014-FGP-0094 | Augmentation of Gravity Main leading to SP175, St Lucia | 2022 | \$2,592,594 |
| 55 | S1-2014-FGP-1020 | Augmentation with a 525mm sewer near South East Busway, Greenslopes | 2022 | \$1,010,707 |
| 55 | S1-2014-FGP-1021 | Augmentation with a 600mm sewer near Baron Street, Greenslopes | 2031 | \$2,972,031 |
| 55 | S1-2014-FGP-1021B | Augmentation with a 600mm sewer near Baron Street, Greenslopes | 2031 | \$1,272,179 |
| 55 | S1-2014-FGP-1025 | Augmentation with a 375mm sewer near Ridge Street, Greenslopes | 2028 | \$2,532,487 |
| 57 | AL00001-AL00018 | Cost based on Bulimba Creek Trunk Sewer Feasibility Study | 2016 | \$82,070,000 |
| 65 | S6-GM44 | Collection main 05 of Church Road PS, Moggill | 2018 | \$159,162 |
| 65 | S6-GM45 | Collection main 06 of Church Road PS, Moggill | 2018 | \$102,417 |
| 70 | S3-2021-FGP-0012 | Sewer Augmentation along Mount Gravatt-Capalaba Road to end of Mascara Street. | 2021 | \$704,352 |
| 70 | S3-2026-FGP-0014 | Montreal St. augmentation. Additional flow from Mt. Gravatt development area. | 2026 | \$80,044 |
| 70 | S3-2031-FGP-0016 | Open space (Malinya Place) Augmentation required due to Mt Gravatt development. | 2031 | \$493,354 |
| 70 | S3-2031-FGP-0016 | Open space (Malinya Place) Augmentation required due to Mt Gravatt development. | 2031 | \$TBA |
| 70 | S3-2041-FGP-0017 | Montreal St. augmentation between Newnham Road and Geneva Street. | 2041 | \$239,940 |
| 78 | RDS-NS21 | Future Growth driven by Rochedale Development | 2021 | \$635,938 |
| 78 | RDS-NS22 | Future Growth driven by Rochedale Development | 2021 | \$54,420 |
| 82 | S3-2016-FGP-0002 | Sewer Augmentation D/S of SP171 two sections off Beenleigh Road and Alpita Road | 2017 | \$135,356 |



Legend

-  Map index
-  Priority infrastructure area
-  Local Government Area



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FILENAME : NETSERV PLAN mapping series Version 5 Index
PROJECTION: MAP GRID OF AUSTRALIA, ZONE 56
HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUST 1994

Basemap Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL

PROJECT

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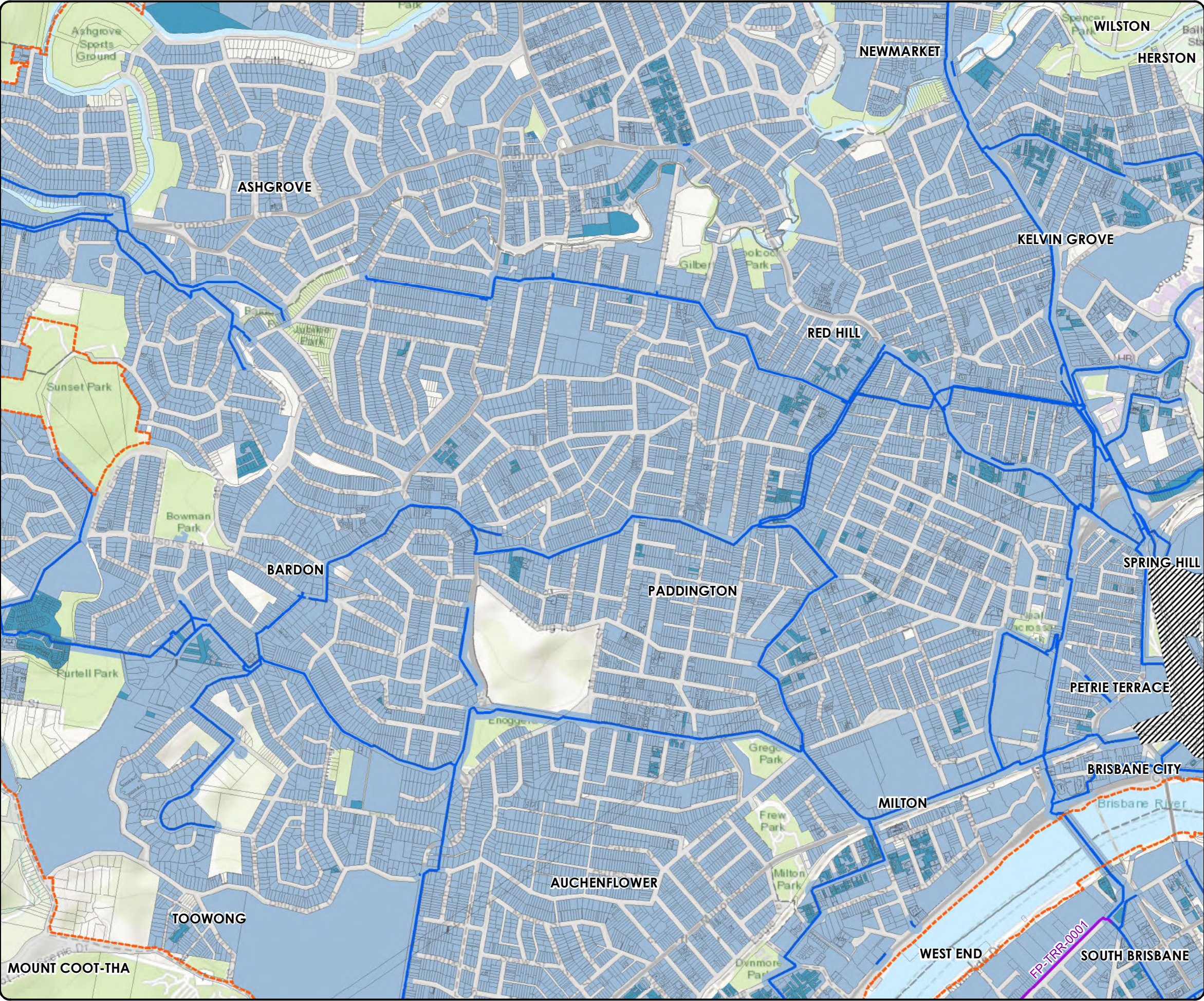
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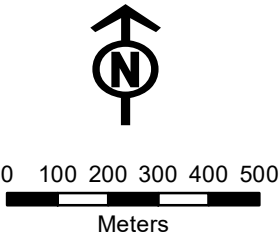
1 - 165

PRIORITY INFRASTRUCTURE AREA

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- Legend**
- Priority infrastructure area
 - Property Boundary (DCDB)
 - Development Area (outside scope)
 - Future Water Trunk Main
 - Existing Water Trunk Main
 - Water Connection Area
 - Water Future Connection Area



Production Scale 1:15,000 @A3 1 cm = 150 m

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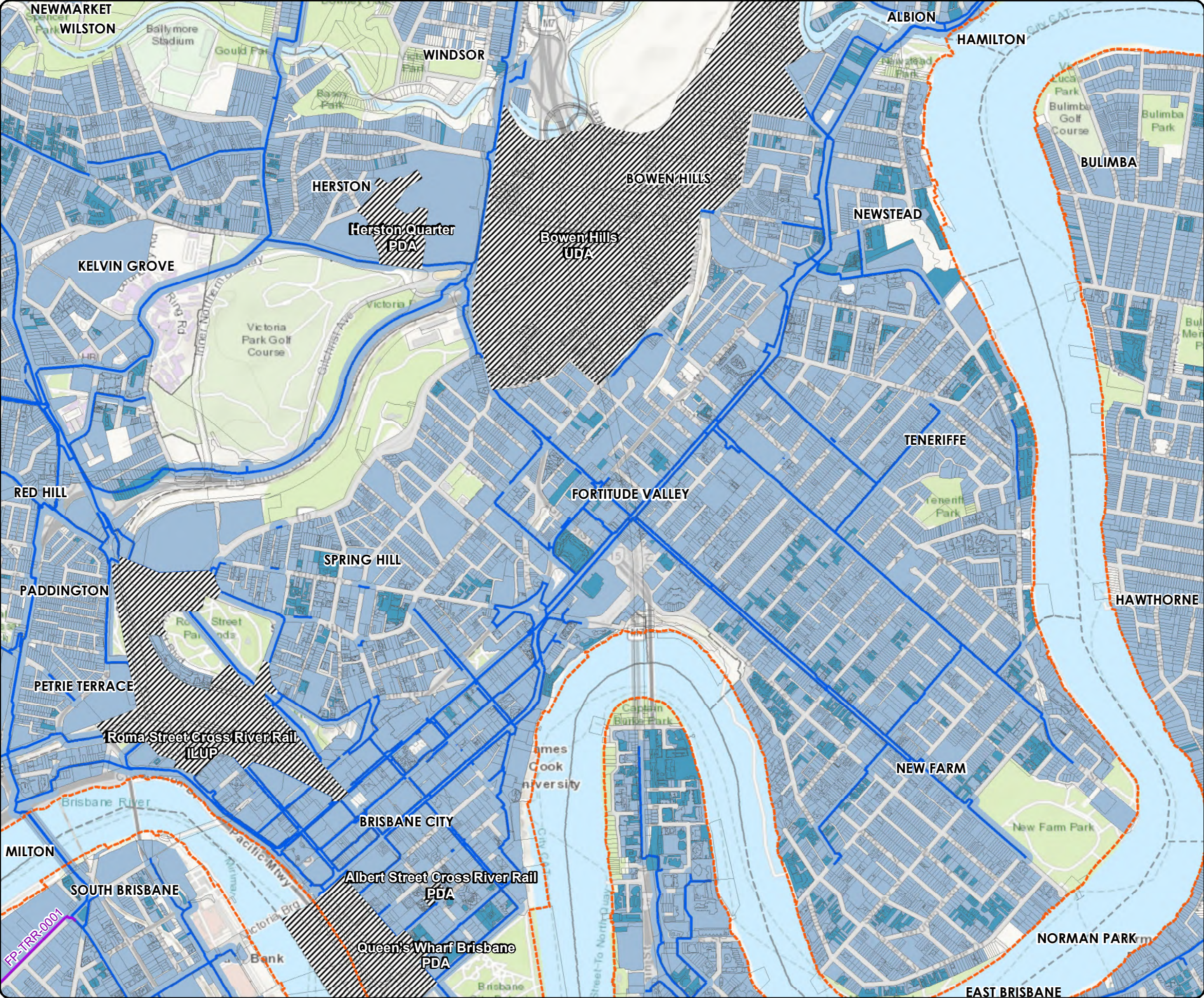
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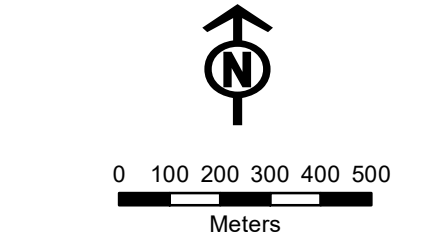
39

**PADDINGTON
BRISBANE CITY**

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- Legend**
- Priority infrastructure area
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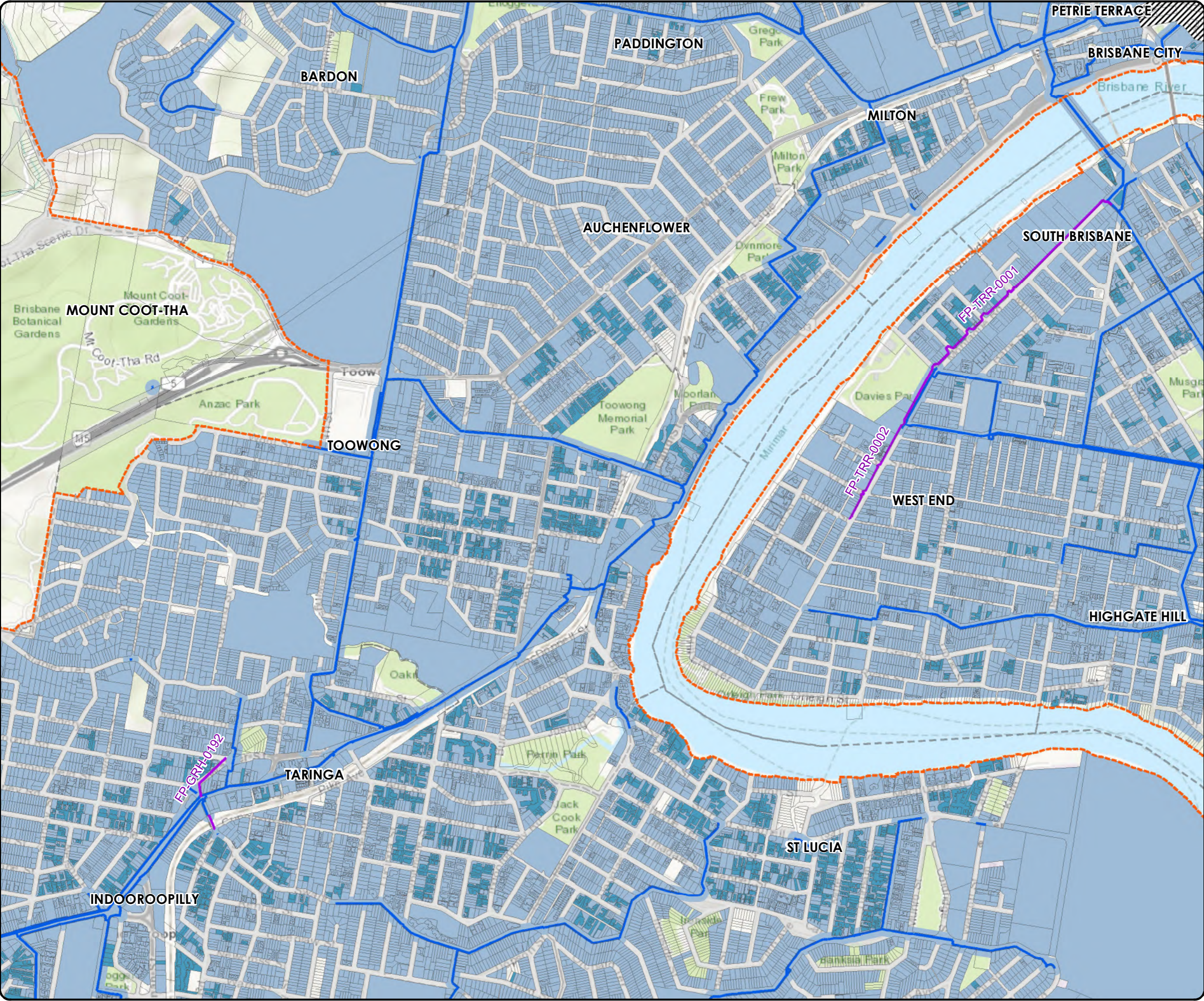
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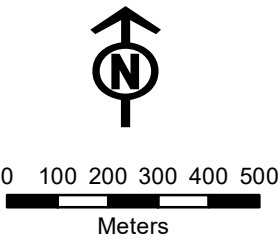
NETSERV PLAN
mapping series

TITLE **Map index number**
40
FORTITUDE VALLEY
BRISBANE CITY

netserv@urbanutilities.com.au



- Legend**
- Priority infrastructure area
 - Property Boundary (DCDB)
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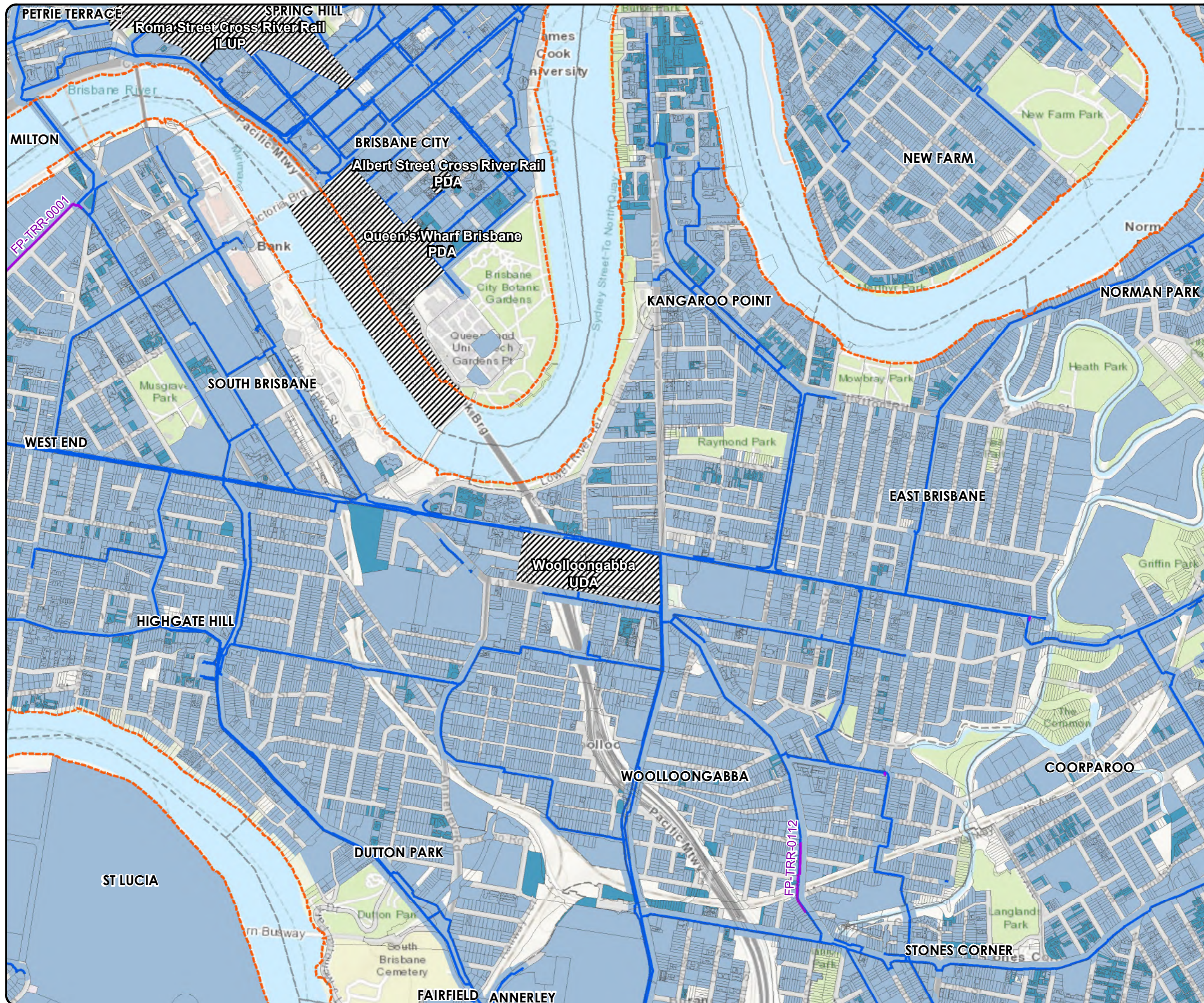
TITLE

Map index number

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TOOWONG
BRISBANE CITY

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Legend

- Priority infrastructure area
- Property Boundary (DCDB)
- Development Area (outside scope)
- Future Water Trunk Main
- Existing Water Trunk Main
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0 100 200 300 400 500
Meters

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PROJECT

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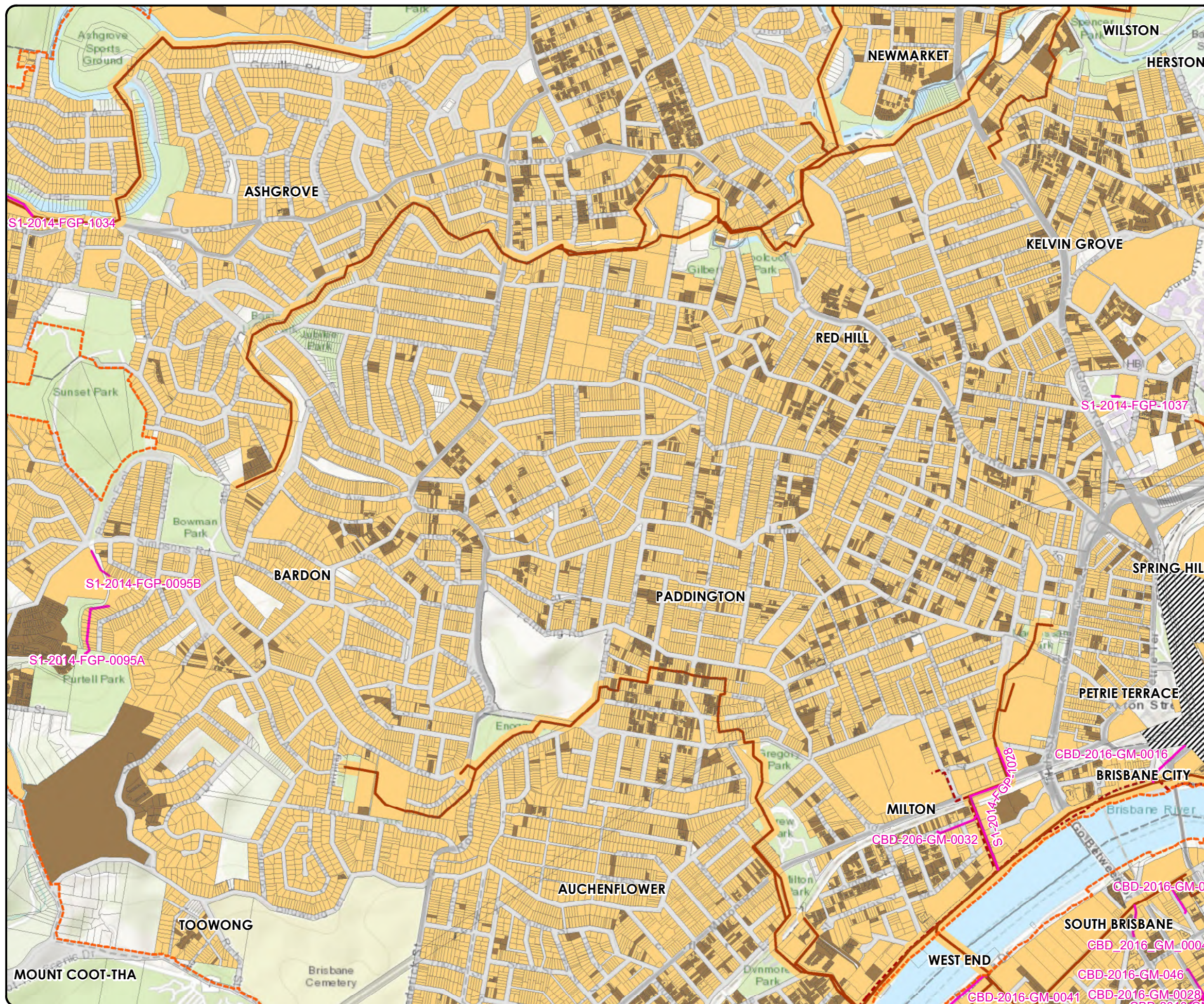
TITLE

Map index number

47

**KANGAROO POINT
BRISBANE CITY**

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Legend

- Priority infrastructure area
- Property Boundary (DCDB)
- Development Area (outside scope)
- Future Wastewater Trunk Main
- Existing Wastewater Trunk Main
- Existing Wastewater Rising Main
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0 100 200 300 400 500
Meters

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mapping series**

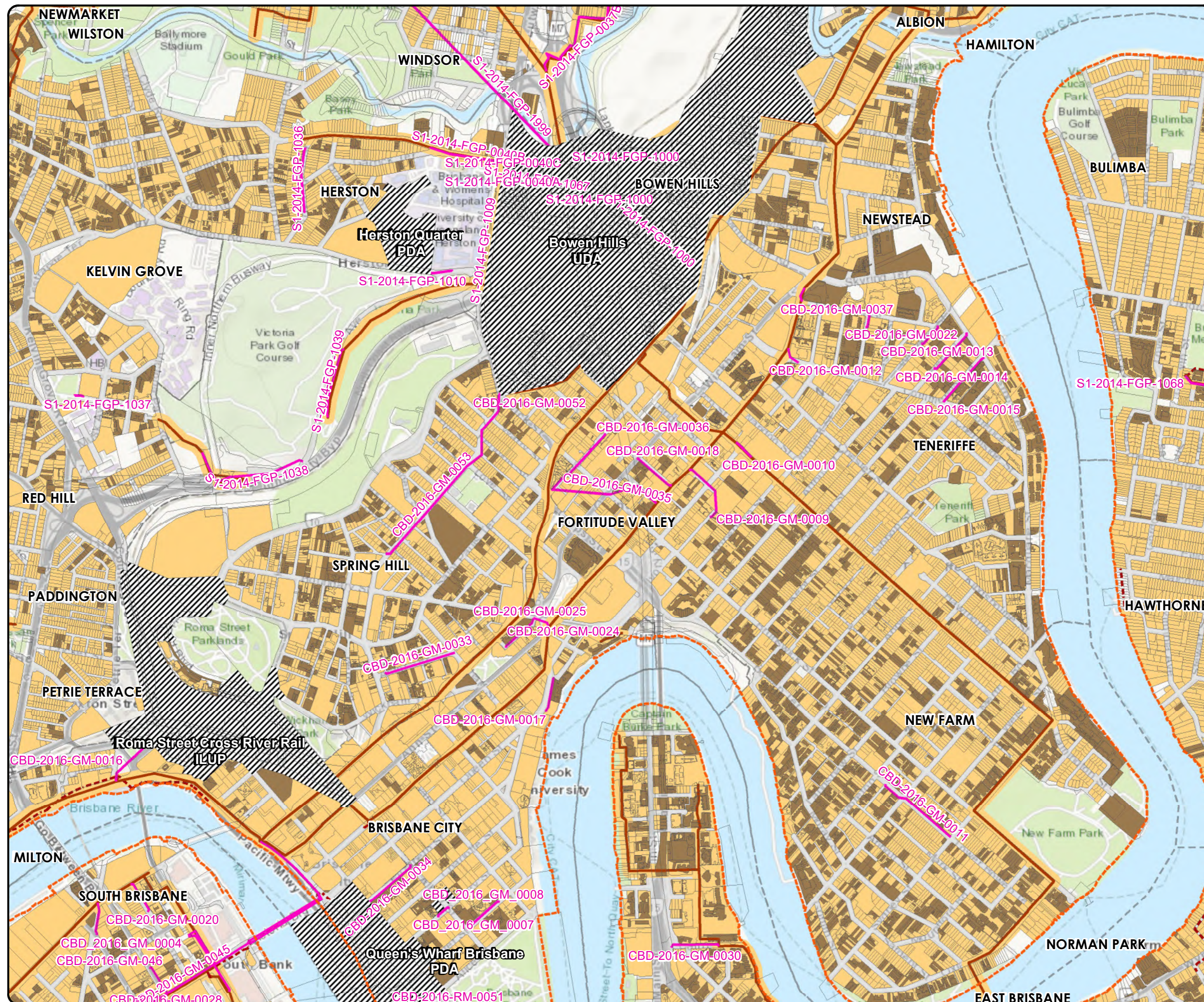
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**PADDINGTON
BRISBANE CITY**

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Legend

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Meters

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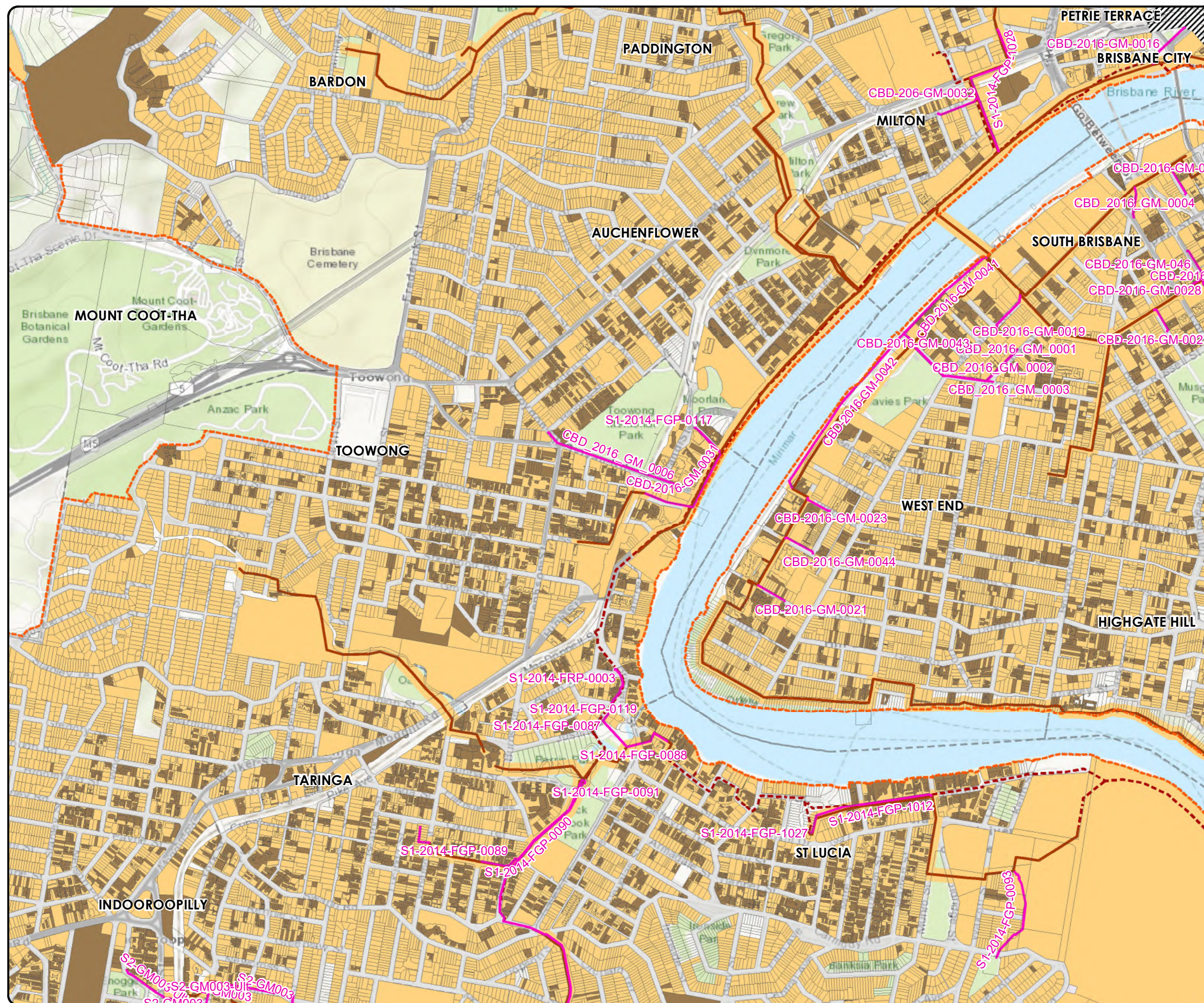
NETSERV PLAN mapping series

TITLE Map index number

40

**FORTITUDE VALLEY
BRISBANE CITY**

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Legend

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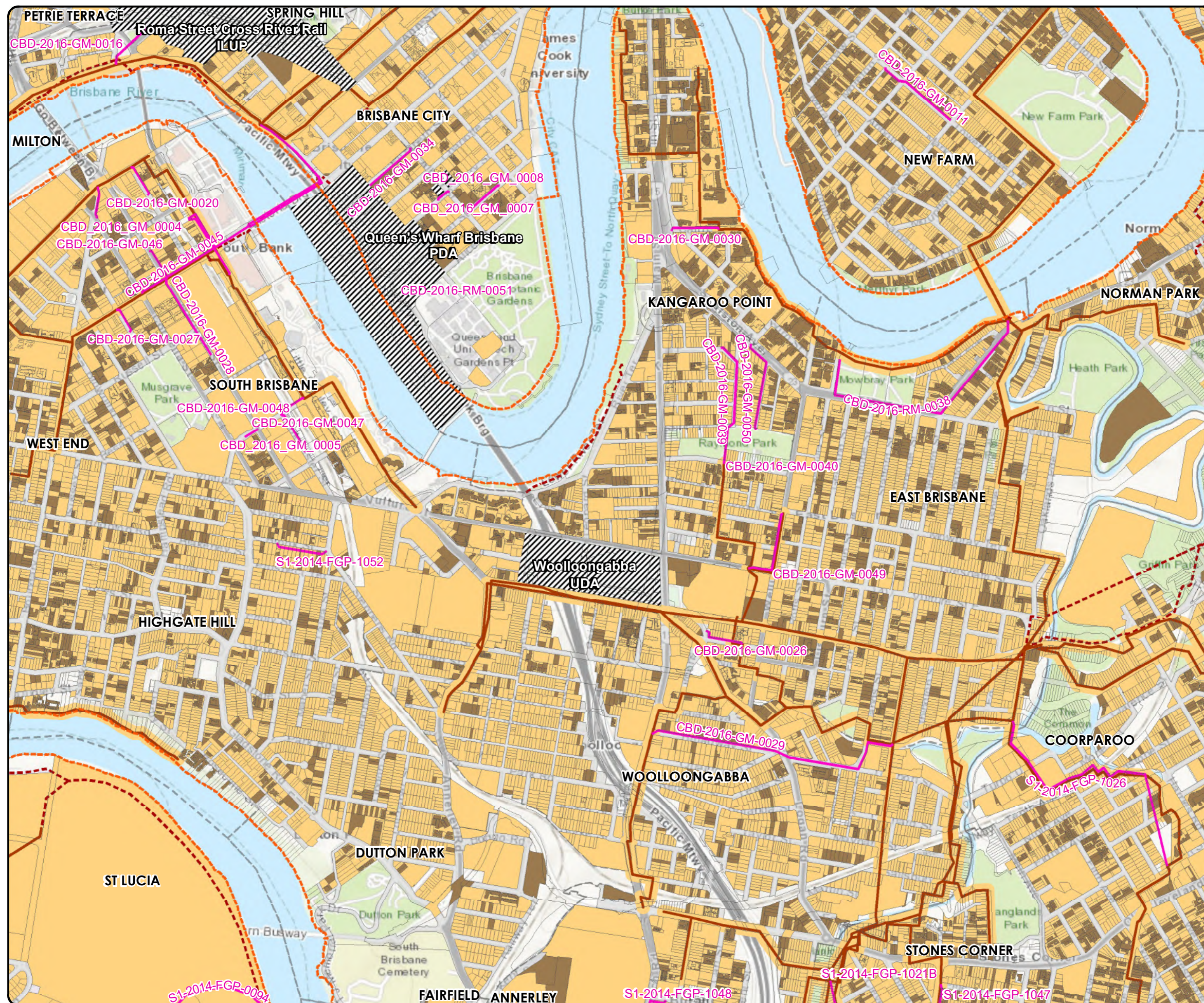
NETSERV PLAN mapping series

| TITLE | Map index number |
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TOOWONG
BRISBANE CITY

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Legend

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0 100 200 300 400 500
Meters

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NETSERV PLAN mapping series

TITLE

Map index number

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**KANGAROO POINT
BRISBANE CITY**

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Attachment C Cost Estimates

| Ref | Description | Pipe Length (m) | Pipe Diameter (mm) | Approx. % of Augmentation Length | | Construction Cost | Principal Costs | Total |
|---------|-----------------------------------|-----------------|--------------------|----------------------------------|-------------|-------------------|-----------------|--------------|
| | | | | Inside PDA | Outside PDA | | | |
| SEW-01A | Augmentation of Makeston St Sewer | 185 | DN400 | 84% | 16% | \$3,094,508 | \$433,231 | \$3,527,739 |
| SEW-01B | Augmentation of North Quay Sewer | 360 | DN400 | 0% | 100% | \$5,947,420 | \$832,639 | \$6,780,059 |
| Total | | 545 | | | | \$9,041,928 | \$1,265,870 | \$10,307,797 |



SEW-01A

Augmentation of Makeston St Sewer

Key Assumptions

| | |
|--|------------------------------|
| Construction method: | Microtunnel, multiple drives |
| Approx. Pipe Length (m) (inc. tie ins) | 185 |
| No. of Manholes | 3 |

| Item | Quantity | Unit | Rate (\$ / unit), Cost | Comments |
|---|----------|--------------|------------------------|--|
| Site mobilisation | 1 | LS | \$250,000 | \$250,000 Protection piles, monitoring, pressure pads, steel plates, spotters, vibration mats etc. |
| Site Set-up Microtunnel Equipment | 1 | LS | \$200,000 | \$200,000 Assumed to setups required for multiple drives |
| Launch Pits (7m x 4m x 5m) | 1 | LS | \$133,000 | \$133,000 Excavation in Rock Assumed |
| Receival Pits (4m x 3m x 5m) | 1 | LS | \$57,000 | \$57,000 Excavation in Rock Assumed |
| DN400 SDR17 PE Carrier Pipe | 185 | m | \$320 | \$59,200 |
| Spacers | 185 | each | \$150 | \$27,750 |
| DN700 Steel Encasement Pipe | 185 | m | \$550 | \$101,750 |
| Microtunnel 700mm | 185 | m | \$7,085 | \$1,310,633 Assume same microtunneling rate for alluvium and rock. Night Works x1.5 |
| Grouting Annulus | 185 | m | \$230 | \$42,550 |
| Excavation and MH construction | 3 | each | \$95,000 | \$285,000 DN1800, assume average depth 5m. |
| Dewatering at manholes | 3 | each | \$40,000 | \$120,000 |
| Restoration of excavations | 3 | ea | \$20,000 | \$60,000 Road Reinstatement etc. |
| Service Protections / Relocations Allowance | 1 | LS | \$75,000 | \$75,000 |
| CCTV,Vacuum, deflection testing, geotechnical testing of backfill | 185 | m | \$825 | \$152,625 |
| Traffic control | 30 | LS | \$5,000 | \$150,000 5 weeks x 6 nights of Night Shifts (\$5k Per Night) |
| Road opening fees | 1 | LS | \$20,000 | \$20,000 |
| Site Demobilisation | 1 | LS | \$50,000 | \$50,000 |
| Sub-Total (Construction) | | | | \$3,094,508 |
| Principals Costs | | | | |
| Preliminaries | 4% | % Cons. Cost | | \$123,780 |
| Detailed Design | 5% | % Cons. Cost | | \$154,725 |
| Survey and Geotech Investigations | 5% | % Cons. Cost | | \$154,725 |
| Sub-Total (Principals Costs) | | | | \$433,231 |
| Total | | | | \$3,527,739 |

Notes

1) Considered Rough Order of Magnitude (ROM) with a degree of accuracy of +/- 50% .

SEW-01B
Augmentation of North Quay Sewer

Key Assumptions:
Construction method: Microtunnel, multiple drives
Approx. Pipe Length (m): 360
No. of Manholes / Pits: 4

| Item | Quantity | Unit | Rate (\$ / unit) | Cost | Comments |
|--|----------|--------------|------------------|-------------|--|
| Construction Costs | | | | | |
| Site mobilisation | 1 | LS | \$250,000 | \$250,000 | Protection piles, monitoring, pressure pads, steel plates, spotters, vibration mats etc. |
| Site Set-up Microtunnel Equipment | 2 | LS | \$200,000 | \$400,000 | Assumed to setups required for multiple drives |
| Excavation of Launch Pits (7m x 4m x 5m) | 2 | LS | \$133,000 | \$266,000 | Excavation in Rock Assumed |
| Excavation of Reveal Pits (4m x 3m x 5m) | 2 | LS | \$57,000 | \$114,000 | Excavation in Rock Assumed |
| DN400 SDR17 PE Carrier Pipe | 360 | m | \$320 | \$115,200 | |
| Spacers | 360 | each | \$150 | \$54,000 | |
| DN700 Steel Encasement Pipe | 360 | m | \$550 | \$198,000 | |
| Microtunnel 700mm diameter | 360 | m | \$7,085 | \$2,550,420 | Assume same microtunneling rate for alluvium and rock. Night Works x1.5 |
| Grouting Annulus | 360 | m | \$230 | \$82,800 | |
| Vortex BH to Existing S1 Sewer | 10 | m | \$22,500 | \$225,000 | Assume BH to be sealed from existing MH. Flow control required. Auger driven. Night Works x1.5 |
| Excavation and MH construction | 4 | each | \$95,000 | \$380,000 | DN1800, assume average depth 5m. |
| Dewatering at manholes | 4 | each | \$40,000 | \$160,000 | |
| Restoration of excavations | 4 | ea | \$20,000 | \$80,000 | Road Reinstatement etc. |
| Service Protections / Relocations Allowance | 1 | LS | \$200,000 | \$200,000 | |
| CCTV,Vacuum, deflection testing, backfill geotechnical testing | 360 | m | \$825 | \$297,000 | |
| Traffic control | 60 | LS | \$8,000 | \$480,000 | 10 weeks x 6 weeks of Night Shifts (\$8k Per Night) |
| Road opening fees | 1 | LS | \$20,000 | \$20,000 | |
| Site Demobilisation | 1 | LS | \$75,000 | \$75,000 | |
| Sub-Total (Construction) | | | | \$5,947,420 | |
| Principals Costs | | | | | |
| Preliminaries | 4% | % Cons. Cost | | \$237,897 | |
| Detailed Design | 5% | % Cons. Cost | | \$297,371 | |
| Survey and Geotech Investigations | 5% | % Cons. Cost | | \$297,371 | |
| Sub-Total (Principals Costs) | | | | \$832,639 | |
| Total | | | | \$6,780,059 | |

Notes

1) Considered Rough Order of Magnitude (ROM) with a degree of accuracy of +/- 50% .