ARCADIS Design & Consultancy for natural and built assets

WATER NETWORK CAPACITY ASSESSMENT

54 GEORGE ALEXANDER WAY, COOMERA

COOMERA GA PTY LTD ATF THE COOMERA GA UNIT TRUST

IMPROVING QUALITY OF **LIFE**

54 GEORGE ALEXANDER WAY - WEST

WATER NETWORK CAPACITY ASSESSMENT

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APPENDICES

APPENDIX A
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1 EXECUTIVE SUMMARY

Coomera GA Pty Ltd ATF The Coomera GA Unit Trust has commissioned Arcadis to undertake a Water Network Capacity Assessment (WNCA) for a residential development application for the site located over the following allotment located on George Alexander Way, Coomera:

- Lot 96 on RP187418 (54 George Alexander Way, Coomera, 4209).

The proposed development intended for the site is for the creation of 3 residential apartment buildings and 10 townhouses.

With the use of the software InfoWater, a hydraulic assessment of the proposed development's impact on the surrounding water network has been undertaken. Council have requested a Water Network Capacity Assessment due to the proposed development's increased loading in excess of CoGC's planned demand for the site relating to potable water services in the earlier 2021-2031 planning horizons.

The assessment resulted in the following conclusions:

Performance at Proposed Connections

- Standard Flow Pressure – The minimum & maximum pressures for both the existing and developed scenarios comply with SEQ's DSS requirements for the majority of assessed planning horizons. Minimum pressure DSS non-compliances are observed in the 2026 and 2036 planning horizons both in the existing and developed demand scenarios, occurring as a result of the closing of valve 'VCM_PI_11100230104_WTVL' in 2026 and valve 'VCM_PI_11100364368_WTVL' in 2036. Opening these valves in their respective horizons resolves the observed DSS non-compliances at the two site connections.
- Standard Flow Velocity – The maximum velocity for both the existing and developed scenarios comply with SEQ's DSS requirements for the assessed planning horizons.
- Fire Flow – The minimum residual pressure DSS of 12m pressure was achieved for the majority of assessed planning horizons. Minimum pressure DSS non-compliances are observed in the 2036 planning horizon both in the existing and developed demand scenarios, occurring as a result of the closing of valve 'VCM_PI_11100364368_WTVL' in 2036. Opening this valve in the 2036 horizon resolves the observed DSS non-compliances at the two site connections.

Coomera/Pimpama LLZ Service Zone DSS Comparison

- Standard Flow Pressure – A number of additional minimum pressure non-compliances are observed in the 2026 horizon, which are resolved following the opening of valve 'VCM_PI_11100230104_WTVL'. Following the opening of valve 'VCM_PI_11100230104_WTVL' in the 2026 horizon and valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon required in both the existing and developed demand scenarios, no additional DSS non-compliances are observed in the Coomera/Pimpama LLZ.
- Standard Flow Velocity – Maximum velocities within the external network are not significantly impacted. One additional max velocity non-compliance is observed as a result of the development, and is resolved following the opening of valve 'VCM_PI_11100230104_WTVL' required in the 2026 horizon in both the existing and developed demand scenarios.
- Fire Flow – No additional minimum residual pressure non-compliances were observed in both the existing and developed scenarios across the assessed planning horizons. One additional max velocity non-compliance is observed as a result of the development, and is resolved following the opening of valve 'VCM_PI_11100230104_WTVL' required in the 2026 horizon in both the existing and developed demand scenarios.

Arcadis believe that the proposed development can be adequately serviced via the existing water network with no proposed augmentations following the opening of valve 'VCM_PI_11100230104_WTVL' in the 2026 horizon (open in the 2021 horizon and closed in the model in the 2026 horizon) and valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon. The opening of these valves is required to achieve DSS compliance in both the existing and developed demand scenarios.

2 SITE CHARACTERISTICS

2.1 LOCATION DETAILS

The subject site is located within George Alexander Way, Coomera, Australia over the following allotment:

- Lot 96 on RP 187418 (54 George Alexander Way, Coomera, QLD, 4209)

The site is bounded by George Alexander Way to the west, a rural residential allotment to the south and residential dwellings to the north and east.

The Gold Coast City Council is the local government authority.

The total area of the site is approximately 30,100m².

An existing approval (OPW/2023/1508) bounds the eastern portion of the site. This approval is for 22 residential lots and supporting infrastructure. This report seeks to support a development application for the balance of the land.

2.2 LAND USAGE

In its current state, the project site consists of a residential dwelling and its associated driveway. Figure 2-1 below provides a current locality plan of the site.

Figure 2-1 Site Locality Plan (Aerial Imagery Courtesy of Nearmap)

3 PROPOSED DEVELOPMENT

The proposed development involves the construction of residential units, including:

- 3 x medium-rise residential buildings.
- 10 x townhouses.
- Municipal and private road network.
- Basement parking.
- Open communal space.
- Stormwater management area

A rendered plan extract of the proposed development has been provided in Figure 3-1.

A full set of development proposal plans are provided within the development application package and should be referred to for further information.

Figure 3-1 Proposed Development Render (Courtesy of Archipelago)

4 RECENT NETWORK ADDITION

An additional portion of the existing recently constructed water network not included in the issued 2019 CoGC network model was identified, which consists of the proposed connection points in Talpa St for the proposed development site and the adjacent approved OPW site.

For the purposes of this assessment, this recently constructed network within Talpa St adjacent to the development site and adjacent approved OPW site has been included into the CoGC water network model as per Figure 4-1 below. Levels for the model elements were sourced from the CoGC online GIS database which specifies pipe material, fittings/connectionsand invert/surface levels.

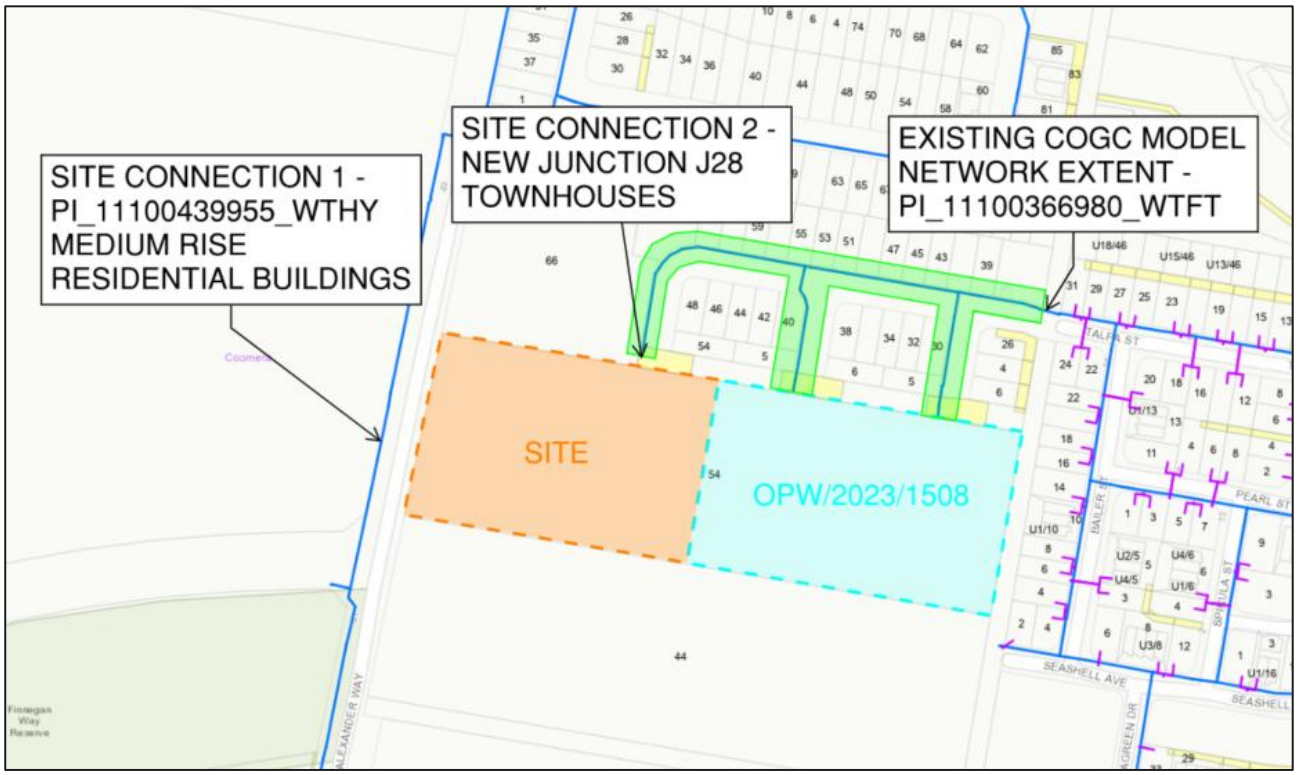

Figure 4-1 Recent Water Network Addition Layout Plan

4.1 COGC ADDITIONAL DEMAND NETWORK ADDITION

Following liaison with CoGC, additional approved development demands are required for addition into the base CoGC network models prior to commencement of the analysis. As these network demands are located within recently constructed water network infrastructure not present in the model, CoGC has requested that this recently constructed water network be included in the model.

CoGC has provided shapefiles for inclusion into the base model to form the alignment of these mains. No modelling information such as pipe diameters, materials and junction surface and invert elevations were included as part of these shapefile elements and these modelling parameters were sourced from the CoGC online GIS database. CoGC advised that as no water junction elevation data is present in this database, this information is to be sourced via the online ELVIS Lidar DEM platform. Available Gold Coast 2009/2014 1m DEM was sourced and used for the purposes of this exercise. Refer to Figure 4-2.

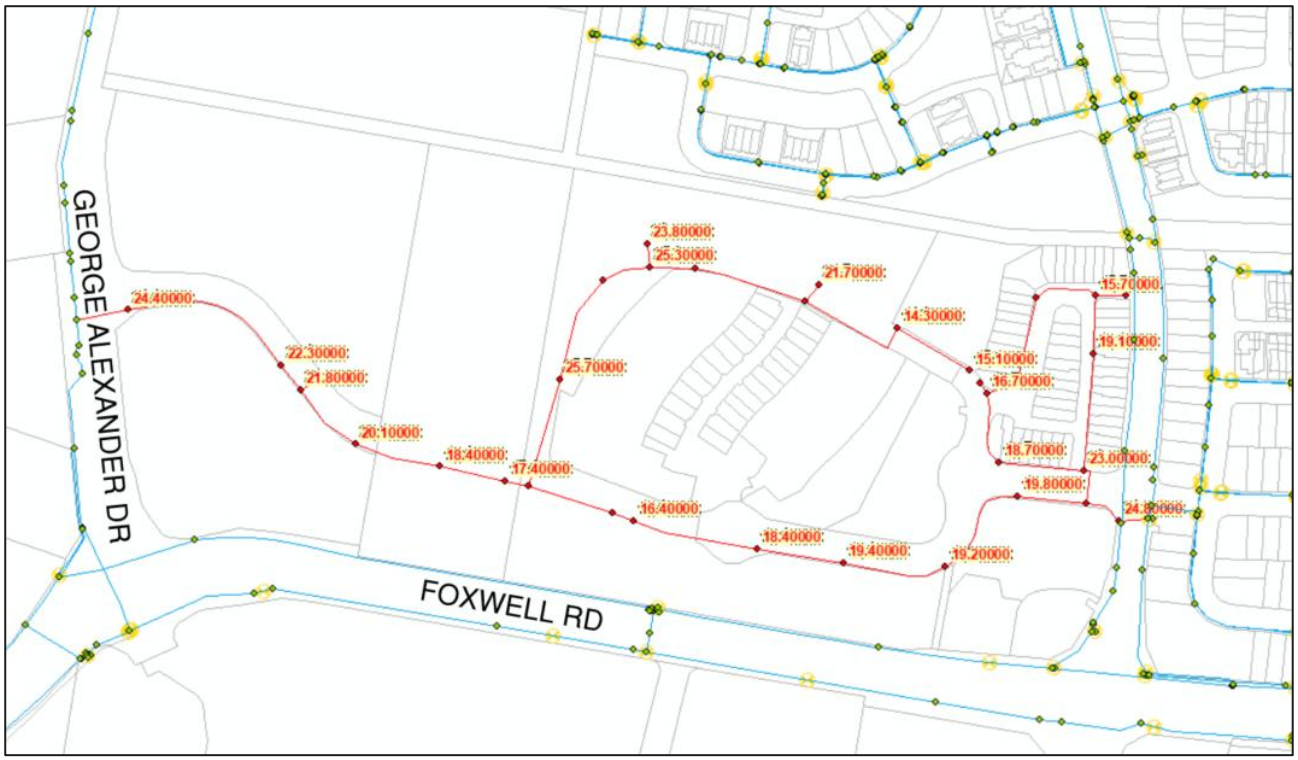

Figure 4-2 CoGC Additional Demand Network Addition – Junction Elevations (Gold Coast 2009/2014 1m DEM - ELVIS)

4.2 COGC PRV SETTING UPDATE

Following liaison with CoGC, it was specified that a flow control valve forming a part of the Foxwell Rd PMA and supplying the water network surrounding the proposed development site requires an update to the settings in the base existing CoGC water network model. It was identified that PRV1126 has an outlet PRV setting of 63m in the existing base model, compared to this PRV operating at an outlet PRV setting of 73m in the field. Updating the outlet PRV setting of PRV1126 from 63m to 73m was required prior to assessment of the water network.

5 PROPOSED DEVELOPMENT LOADING

For the purposes of this report, the development has been assessed under two loading cases to better determine the anticipated impact to be had on the surrounding network. These cases are as follows:

- **Existing Case with other Over-Planning-Scheme Density Sites** – A demand assigned to the site via the infrastructure Demand Model (IDM) 2018 provided by GCWW with additional loads included of other proposed developments (refer to section 4 for further details) as instructed by GCWW. All planning horizons were assessed; and
- **Developed Case with other Over-Planning-Scheme Density Sites** – The calculated demand for the property based on proposed architect plans and conversion rates from the Water Supply & Sewerage Infrastructure Plan Demand Table. Additional loads included of other proposed development's (refer to section 4 for further details) as instructed by GCWW.

Where applicable, the proposed development may be assessed against the existing network, in isolation of any other planned sites to better ascertain responsibility and network augmentations.

Table 5-1 shows the Equivalent Persons (EP) for the existing site based specified for removal for this modelling exercise comprising the demand assigned to the proposed development site. Table 5-2 shows the calculated EP for the proposed development as per CoGC's 'Water and sewage demand table'.

Table 5-1 Existing Modelled Demand

Planning Horizon	Modelled Existing Demand (EP)	
	PI_11100439955_WTHY	PI_11100366980_WTFT
2021	0	0
2026	0	0
2031	0	0
2036	618.4 (RMF_1) 265.0 (TOU_1) 883.4 Total	76.0 (RMF_1)
2041	625.4 (RMF_1) 268.0 (TOU_1) 893.4 Total	76.9 (RMF_1)
2066	625.4 (RMF_1) 268.0 (TOU_1) 893.4 Total	76.9 (RMF_1)

Table 5-2 Development Loading – Site Area

Category	Quantity	Conversion Rate	Proposed Demand (EP)
Multi-Unit Dwelling 1 bedroom	35	1.31	45.9
Multi-Unit Dwelling 2 bedroom	129	1.76	227.0
Multi-Unit Dwelling 3 bedroom	19	2.51	47.7
	Junction 'PI_11100439955_WTHY' Sub-total		320.6
Attached Dwelling	10	2.51	25.1
		New Junction 'J28' Sub-total*	25.1
		Total	345.7

**Corresponds to existing junction 'PI_11100366980_WTFT' connection*

As per Figure 3-1 the site area does not encompass the entire 54 George Alexander Way lot area and corresponding existing modelled demand. As such, the demand for the adjacent area OPW/2023/1508 area has been determined in Table 5-3 below and included in this modelling exercise, applied at their corresponding new junctions in Talpa Street adjacent to the site boundary.

Table 5-3 Approved Development Loading – OPW/2023/1508 Area

Category	Quantity	Conversion Rate	Proposed Demand (EP)
Detached Dwelling	22	2.79	61.4

Table 5-4 below compares the total proposed development demand for the 54 George Alexander Way lot to the demand assigned to the lot by CoGC and the base water network model.

Table 5-4 Demand Application Table at Proposed Connections

Planning Horizon	Existing Loads to be Removed (EP)		Allotment Demand (EP)	
	PI_11100439955_WTHY	PI_11100366980_WTFT	Proposed Site Demand Applied at PI_11100439955_WTHY	Proposed Site Demand Applied at J28* + OPW/2023/1508
2021	0	0	320.6 (RMF_1)	86.5 (RSF_1)
2026	0	0	320.6 (RMF_1)	86.5 (RSF_1)
2031	0	0	320.6 (RMF_1)	86.5 (RSF_1)
2036	618.4 (RMF_1) 265.0 (TOU_1) 883.4 Total	76.0 (RMF_1)	320.6 (RMF_1)	86.5 (RSF_1)
2041	625.4 (RMF_1) 268.0 (TOU_1) 893.4 Total	76.9 (RMF_1)	320.6 (RMF_1)	86.5 (RSF_1)
2066	625.4 (RMF_1) 268.0 (TOU_1) 893.4 Total	76.9 (RMF_1)	320.6 (RMF_1)	86.5 (RSF_1)

**Corresponds to existing junction 'PI_11100366980_WTFT' connection*

The proposed demand presents an overall increase in EPs between the 2021 to 2031 planning horizons compared to existing modelled demand assigned to the development site. The proposed demand presents a significant decrease in EPs between the 2036 to 2066 planning horizons compared to existing modelled demand assigned to the development site of -525.5/-536.4 EPs, summarised in Table 5-5 below.

Table 5-5 Demand Application Table at Proposed Connections

Planning Horizon	Demand Net Increase (EP)		
	PI_11100439955_WTHY	PI_11100366980_WTFT	TOTAL
2021	320.6	86.5	433.9
2026	320.6	86.5	433.9
2031	320.6	86.5	433.9
2036	-562.8	10.5	-525.5
2041	-572.8	9.6	-536.4
2066	-572.8	9.6	-536.4

6 MODELLING ASSUMPTIONS

The potable water supply network surrounding the proposed development site was modelled using the Northern Region InfoWater model "Northern_v102_WSSIP_2019" supplied by CoGC in August 2019. The development demand has been applied in the 2021, 2026, 2031, 2036, 2041 and the 2066 horizons (2066 corresponding to Planning Scheme Demand). The analysis was undertaken considering the following assumptions and design criteria (Note: All design criteria are in accordance with Table 4.1 – Water Network Design Criteria (Gold Coast) of the SEQ D & C Code):

- The site is located within the Coomera/Pimpama LLZ;
- The Coomera/Pimpama LLZ was used as the assessment domain;
- 3-day standard flow simulation under Maximum Day (MD) condition with a minimum design pressure of 22m and a maximum design pressure of 80m;
- 3-day standard flow simulation under Maximum Day (MD) condition with a maximum design velocity of 2.5m/s;
- 1-day fire flow simulation under Maximum Day (MD) condition with a minimum design pressure of 12m and a maximum design pressure of 80m. Further explanation regarding the fire flow is found in Section 5.3 of this report;

The development will be serviced from two connection points – 'PI_11100439955_WTHY' and new junction 'J28', as shown in Figure 4-1;

- The three medium rise residential buildings will be serviced via junction 'PI_11100439955_WTHY' and pipe 'CP_3705PIPE_11100441305';
- The townhouses will be serviced via new junction 'J28' and new pipe 'P13692';
- Demand has been applied using the Residential Multi Family (RMF_1) as discussed in Section 3 of this report;
- GCWW advised that there are three other above planning-scheme-density sites to be included as part of the assessment. Council correspondence can be found in Appendix C; and

GCWW advised that two nodes service the current site. These existing demands will be removed in the Developed Scenarios. More details regarding the loads to be removed can be found in Appendix C and Section 5.

7 MODELLING METHODOLOGY

The proposed development was incorporated into the InfoWater model by applying the anticipated loads at the specified connection point of the model as per Table 5-1 below. It is noted that the proposed development load was split to suit the different aspects of the development as noted in Section 3.1. The impact on the existing water supply network was assessed by verifying and comparing the standard flow pressure, fire flow pressure and pipe velocity against SEQ's DSS in the vicinity of the development site.

The assessment results have been divided across the results at the proposed development connection points and impacts to the external network hydraulic modelling performance of the Coomera/Pimpama LLZ service zone.

7.1 STANDARD FLOW PRESSURE

The standard flow scenario was assessed for all planning scheme horizons (2021, 2026, 2031, 2036, 2041 & 2066) in the existing and developed scenarios. In the developed scenario the development loads were applied to the specified connection points and the results were then compared to the results modelled in the existing scenario. The minimum and maximum pressures in the previously specified vicinity to the proposed development were assessed over a 72-hour period using a steady state simulation.

7.2 PIPE VELOCITY

The standard flow scenario was assessed for all planning scheme horizons (2021, 2026, 2031, 2036, 2041 & 2066) for both the existing and developed scenario to determine pipe velocities. In the developed scenario the additional loads were applied to the specified connection point and the results were then compared to the results modelled in the existing scenario. The minimum and maximum velocities in the previously specified vicinity to the proposed development were assessed over a 72-hour period using a steady state simulation.

7.3 FIRE FLOW VELOCITY

The fire flow scenario was modelled using a fire flow simulation of 1 day by applying 15L/s fire flow demand using the model's 'FF, 18:00HR' loading pattern. The minimum fire flow pressures in the specified vicinity of the site were then assessed against the SEQ's DSS.

8 NETWORK PERFORMANCE AT PROPOSED CONNECTIONS

The below assessment results have been divided across the results at the proposed development connection points and impacts to the external network hydraulic modelling performance of the Coomera/Pimpama LLZ service zone.

8.1 EXISTING SYSTEM PERFORMANCE

8.1.1 STANDARD FLOW PRESSURES

The InfoWater simulation results are displayed below. The minimum and maximum pressures within the modelled domain are presented in Table 8-1.

Table 8-1 Existing Standard Flow Pressures at Proposed Site Connections

Planning Horizon	PI_11100439955_WTHY		J28		DSS Compliant (YES/NO)
	Min Pressure (m):	Max Pressure (m):	Min Pressure (m):	Max Pressure (m):	
2021	41.7	50.3	40.1	55.7	YES
2026	22.4	45.1	19.5	50.5	NO
2026[N1]	40.9	58.5	36.7	63.6	YES
2031	34.0	51.3	33.6	56.8	YES
2036	11.9	53.8	12.6	59.2	NO
2036[N2]	28.8	52.4	28.7	57.9	YES
2041	27.9	59.3	27.4	64.7	YES
2066	31.3	59.5	30.7	65.0	YES

N1 – Includes opening of valve VCM_PI_11100230104_WTVL which is closed in the 2026 horizon

N2 – Includes opening of valve VCM_PI_11100364368_WTVL which is closed in the 2036 horizon

The above existing scenario results indicate the minimum and maximum pressures at the proposed site connections for the 2021, 2031, 2041 and 2066 planning horizons are in accordance with SEQ's DSS requirements.

Existing minimum pressure DSS non-compliances are observed in the 2026 and 2036 planning horizons. As observed in the above table, a significant reduction in pressure from the 2021 horizon is observed, which also occurs across the surrounding existing water network. The difference in network operation between these two horizons was identified to occur as a result of the closing of valve 'VCM_PI_11100230104_WTVL' receiving supply from a DN300 water main west of the development site, active in the 2021 horizon. As per Table 8-1, opening this valve in the 2026 planning horizon rectifies these existing DSS non-compliances and allows the network to meet minimum pressure requirements at the proposed site connections to the same degree as the previous 2021 horizon. Refer to Figure 8-1 for location of the valves modified as a part of this assessment.

Following liaison with CoGC, it was identified that valve 'VCM_PI_11100364368_WTVL' is set to closed in the 2031 and 2036 planning horizons to develop a strategy that identifies optimisation of the water supply network by shifting zone boundaries to defer necessary pipe augmentations and interconnection of Drinking and Non-Drinking water supply network by 2031. CoGC has specified that with the additional approved development demands which comprise a significant increase in EPs to the area, opening this valve may be capable of resolving the zone wide pressure drops experienced in the network. As reflected in Table 8-1, opening valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon resolves the minimum pressure DSS non-compliances observed at the site connection.

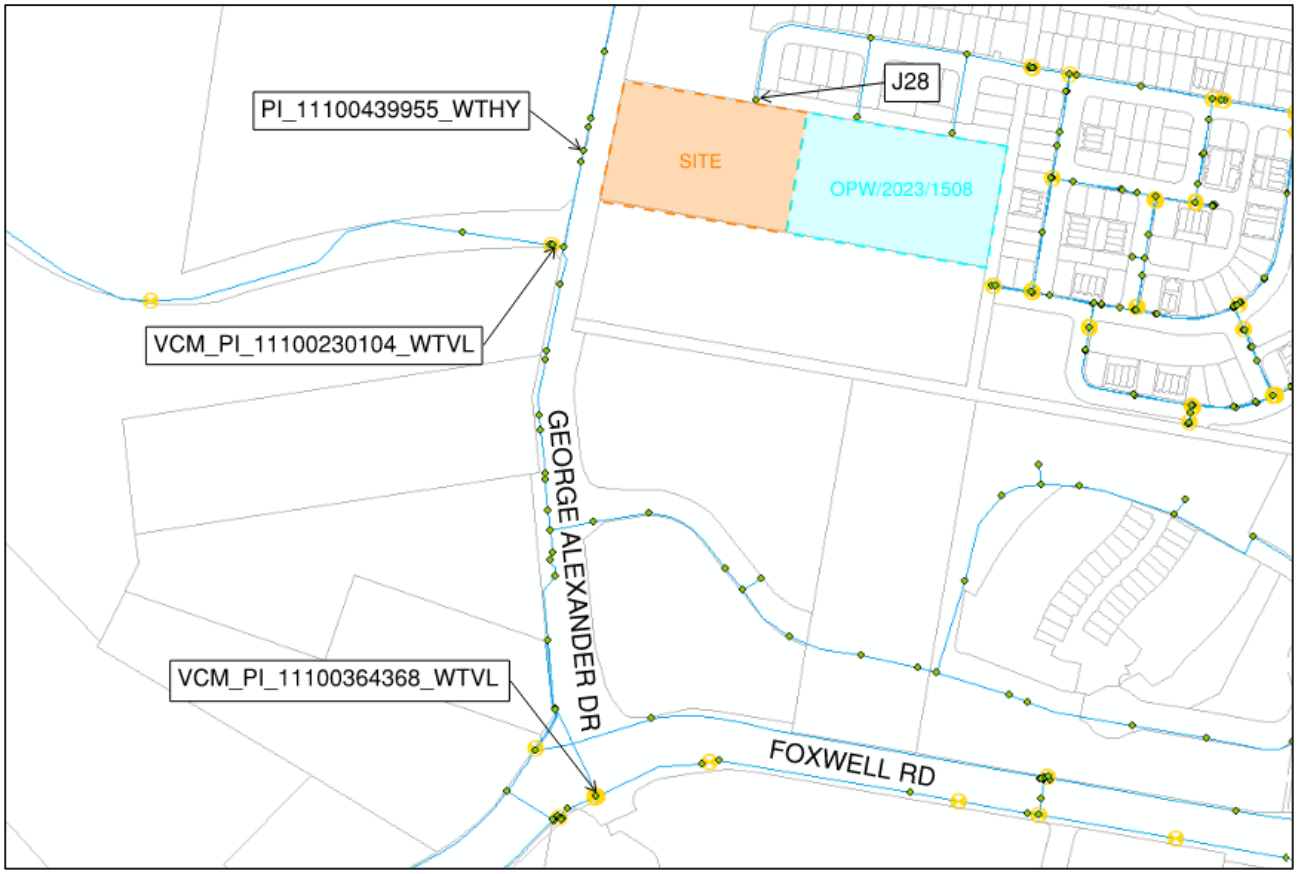

Figure 8-1 Modified Valves Location Plan

8.1.2 STANDARD FLOW VELOCITIES

The InfoWater simulation results are displayed in Table 8-2. The maximum velocities within the modelled domain and the primary connecting pipe are presented below.

Table 8-2 Existing Standard Flow Velocities at Proposed Site Connections

Planning Horizon	CP_3705PIPE_11100441305	P13692	DSS Compliant (YES/NO)
	Max Velocity: (m/s)	Max Velocity: (m/s)	
2021	0.23	0.00	YES
2026	0.21	0.00	YES
2026[N1]	0.22	0.00	YES
2031	0.19	0.00	YES
2036	0.27	0.00	YES
2036[N2]	0.28	0.00	YES
2041	0.29	0.00	YES
2066	0.35	0.00	YES

N1 – Includes opening of valve VCM_PI_11100230104_WTVL which is closed in the 2026 horizon

N2 – Includes opening of valve VCM_PI_11100364368_WTVL which is closed in the 2036 horizon

The above existing scenario results indicate maximum velocities within the mains supplying the proposed site connections demonstrate compliance with SEQ code. These results will be the basis of which the developed scenario is assessed against.

8.1.3 FIRE FLOW PRESSURE/ VELOCITY

The existing scenario fire flow model simulations were run at the two proposed development connections individually with a fire flow demand of 15L/s. The fire flow residual pressure and pipe velocity results are presented in Table 8-3 below.

Table 8-3 Existing Fire Flow Pressure & Velocity at Proposed Site Connections

Planning Horizon	Junction PI_11100439955_WTHY and Pipe CP_3705PIPE_11100441305		Junction J28 and Pipe P13692		DSS Compliant (YES/NO)
	Min Residual Pressure (m)	Max Velocity (m/s)	Min Residual Pressure (m)	Max Velocity (m/s)	
2021	41.7	0.38	27.3	1.59	YES
2026	22.4	0.36	14.9	1.59	YES
2026[N1]	39.6	0.38	23.1	1.59	YES
2031	34.0	0.35	16.9	1.59	YES
2036	11.9	0.41	0.4	1.59	NO
2036[N2]	26.4	0.43	18.0	1.59	YES
2041	27.9	0.43	19.2	1.59	YES
2066	31.3	0.48	20.7	1.59	YES

N1 – Includes opening of valve VCM_PI_11100230104_WTVL which is closed in the 2026 horizon

N2 – Includes opening of valve VCM_PI_11100364368_WTVL which is closed in the 2036 horizon

The fire flow simulations show the DSS of a minimum of 12m pressure is achieved at the proposed site connections for the 2021, 2026, 2031, 2041 and 2066 planning horizons are in accordance with SEQ's DSS requirements.

Existing minimum residual pressure DSS non-compliances are observed in the 2036 planning horizon at the proposed site connections. As reflected in Table 8-3, opening valve 'VCM_PI_11100364368_WTVL' resolves the minimum pressure DSS non-compliances observed at the site connection.

8.2 DEVELOPED SYSTEM PERFORMANCE

8.2.1 STANDARD FLOW PRESSURES

The InfoWater simulation results are displayed in Table 8-4. The minimum and maximum pressures within the modelled domain are presented.

Table 8-4 Developed Standard Flow Pressures at Proposed Site Connections

Planning Horizon	PI_11100439955_WTHY		J28		DSS Compliant (YES/NO)
	Min Pressure (m):	Max Pressure (m):	Min Pressure (m):	Max Pressure (m):	
2021	41.3	50.3	39.7	55.7	YES
2026	21.7	45.1	18.7	50.5	NO
2026[N1]	28.8	58.4	26.9	63.5	YES
2031	32.8	51.3	32.3	56.7	YES
2036	14.0	53.8	14.4	59.3	NO
2036[N2]	29.4	52.4	29.0	57.9	YES
2041	28.5	59.3	27.7	64.7	YES
2066	31.7	59.5	30.9	65.0	YES

N1 – Includes opening of valve VCM_PI_11100230104_WTVL which is closed in the 2026 horizon

N2 – Includes opening of valve VCM_PI_11100364368_WTVL which is closed in the 2036 horizon

The above developed scenario results indicate the minimum and maximum pressures at the proposed site connections for the 2021, 2031, 2041 and 2066 planning horizons are in accordance with SEQ's DSS requirements.

Existing minimum pressure DSS non-compliances are observed in the 2026 and 2036 planning horizons. As per the existing scenario results, the 2021 DSS non-compliances are a result of the closing of valve 'VCM_PI_11100230104_WTVL' from the 2021 to the 2026 horizon and the closing of valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon. Opening valve 'VCM_PI_11100230104_WTVL' in the 2026 horizon and valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon resolves these DSS non-compliances and allows for the site connections to meet the required minimum pressure DSS.

8.2.2 STANDARD FLOW VELOCITIES

The InfoWater simulation results are displayed in Table 8-5. The maximum velocities within the modelled domain and the connecting pipe are presented below.

Table 8-5 Developed Standard Flow Velocities at Proposed Site Connections

Planning Horizon	CP_3705PIPE_11100441305	P13692	DSS Compliant (YES/NO)
	Max Velocity: (m/s)	Max Velocity: (m/s)	
2021	0.27	0.02	YES
2026	0.24	0.02	YES
2026[N1]	0.27	0.02	YES
2031	0.22	0.02	YES
2036	0.21	0.02	YES
2036[N2]	0.22	0.02	YES
2041	0.24	0.02	YES
2066	0.30	0.02	YES

N1 – Includes opening of valve VCM_PI_11100230104_WTVL which is closed in the 2026 horizon

N2 – Includes opening of valve VCM_PI_11100364368_WTVL which is closed in the 2036 horizon

The above developed scenario results indicate maximum velocities within the mains supplying the proposed site connections demonstrate compliance with SEQ code.

8.2.3 FIRE FLOW PRESSURE/ VELOCITY

The existing scenario fire flow model simulations were run at the two proposed development connections individually with a fire flow demand of 15L/s. The fire flow residual pressure and pipe velocity results are presented in Table 8-6 below.

Table 8-6 Developed Fire Flow Pressure & Velocity at Proposed Site Connections

Planning Horizon	Junction PI_11100439955_WTHY and Pipe CP_3705PIPE_11100441305		Junction J28 and Pipe P13692		DSS Compliant (YES/NO)
	Min Residual Pressure (m)	Max Velocity (m/s)	Min Residual Pressure (m)	Max Velocity (m/s)	
2021	41.3	0.41	26.3	1.60	YES
2026	22.6	0.36	13.4	1.60	YES
2026[N1]	39.3	0.41	22.1	1.60	YES
2031	32.8	0.38	15.1	1.60	YES
2036	14.0	0.37	1.1	1.60	NO
2036[N2]	29.4	0.38	17.7	1.60	YES
2041	28.5	0.38	18.8	1.60	YES
2066	31.7	0.44	20.3	1.60	YES

N1 – Includes opening of valve VCM_PI_11100230104_WTVL which is closed in the 2026 horizon

N2 – Includes opening of valve VCM_PI_11100364368_WTVL which is closed in the 2036 horizon

The fire flow simulations show the DSS of a minimum of 12m pressure is achieved at the proposed site connections for the 2021, 2026, 2031, 2041 and 2066 planning horizons are in accordance with SEQ's DSS requirements.

Developed minimum residual pressure DSS non-compliances are observed in the 2036 planning horizon at the proposed site connections as per the existing scenario results. As reflected in Table 8-6, opening valve 'VCM_PI_11100364368_WTVL' resolves the minimum pressure DSS non-compliances observed at the site connection.

9 SERVICE ZONE - STANDARD FLOW & FIRE FLOW DSS COMPARISON

An assessment of the external water supply network service zone supplying the proposed development (Coomera/Pimpama LLZ) was undertaken, with a comparison undertaken to determine the difference in existing network DSS non-compliances and developed network DSS non-compliances following the addition of the proposed development demands. This assessment was undertaken across the 2021, 2026, 2031, 2026, 2031, 2036, 2041 and 2066 scenarios.

A summary of additional DSS non-compliances observed is tabulated in Table 9-1 below.

Table 9-1 External Service Zone – Additional DSS Non-Compliances Following Addition of Site Demand

Planning Horizon	Standard Flow – No. of Additional DSS Non-Compliances Following Addition of Site Demand			Fire Flow Simulation at Junction PI_11100439955_WTHY – No. of Additional DSS Non-Compliances Following Addition of Site Demand		Fire Flow Simulation at Junction J28 – No. of Additional DSS Non-Compliances Following Addition of Site Demand	
	Min. Pressure	Max. Pressure	Max. Velocity	Min. Residual Pressure	Max. Velocity	Min. Residual Pressure	Max. Velocity
MD_WSSIP19_2021	0	0	0	0	0	0	0
MD_WSSIP19_2026	28	0	1	0	-1	0	1
MD_WSSIP19_2026[N1]	0	-12	-2	0	0	0	0
MD_WSSIP19_2031	0	0	0	0	0	0	0
MD_WSSIP19_2036	-116	4	0	-15	0	0	0
MD_WSSIP19_2036[N2]	0	0	0	0	0	0	0
MD_WSSIP19_2041	-4	3	0	0	0	0	0
MD_WSSIP19_2066	-1	0	-3	0	-3	0	-3

N1 – Includes opening of valve VCM_PI_11100230104_WTVL which is closed in the 2026 horizon

N2 – Includes opening of valve VCM_PI_11100364368_WTVL which is closed in the 2036 horizon

The above results indicate a minimal number of additional DSS non-compliances are observed in the external water network following the addition of the proposed site demands.

A number of additional minimum pressure non-compliances are observed in the 2026 horizon, which are resolved following the opening of valve 'VCM_PI_11100230104_WTVL'. After the opening this valve, a reduction of maximum pressure non-compliances are observed as a result of the additional proposed development demands improving zone functionality. A large reduction in minimum pressure non-compliances are observed in the 2036 horizon as a result of the reduction in proposed site demand vs existing demand assigned in the CoGC model, resulting in an improvement to the DSS non-compliances within the existing network. Four additional maximum non-compliances are observed in the 2036 horizon, consisting of minimal pressure increases of ≈0.004m from 79.998m to 80.002m. It is noted that following the opening of valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon required in both the existing and developed demand scenarios, no differences in amount of DSS non-compliances in the 2036 horizon are observed.

One maximum velocity non-compliance is observed in the 2026 horizon, however this non-compliance is resolved following the opening of valve 'VCM_PI_11100230104_WTVL'.

No further increases in DSS non-compliances following the addition of the proposed site demand are observed across the remaining horizons.

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10 CONCLUSION

This Water Network Capacity Assessment shows that the proposed development can be adequately serviced via the existing network.

Performance at Proposed Connections

- Standard Flow Pressure – The minimum & maximum pressures for both the existing and developed scenarios comply with SEQ's DSS requirements for the majority of assessed planning horizons. Minimum pressure DSS non-compliances are observed in the 2026 and 2036 planning horizons both in the existing and developed demand scenarios, occurring as a result of the closing of valve 'VCM_PI_11100230104_WTVL' in 2026 and valve 'VCM_PI_11100364368_WTVL' in 2036. Opening these valves in their respective horizons resolves the observed DSS non-compliances at the two site connections.
- Standard Flow Velocity – The maximum velocity for both the existing and developed scenarios comply with SEQ's DSS requirements for the assessed planning horizons.
- Fire Flow – The minimum residual pressure DSS of 12m pressure was achieved for the majority of assessed planning horizons. Minimum pressure DSS non-compliances are observed in the 2036 planning horizon both in the existing and developed demand scenarios, occurring as a result of the closing of valve 'VCM_PI_11100364368_WTVL' in 2036. Opening this valve in the 2036 horizon resolves the observed DSS non-compliances at the two site connections.

Coomera/Pimpama LLZ Service Zone DSS Comparison

- Standard Flow Pressure – A number of additional minimum pressure non-compliances are observed in the 2026 horizon, which are resolved following the opening of valve 'VCM_PI_11100230104_WTVL'. Following the opening of valve 'VCM_PI_11100230104_WTVL' in the 2026 horizon and valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon required in both the existing and developed demand scenarios, no additional DSS non-compliances are observed in the Coomera/Pimpama LLZ.
- Standard Flow Velocity – Maximum velocities within the external network are not significantly impacted. One additional max velocity non-compliance is observed as a result of the development, and is resolved following the opening of valve 'VCM_PI_11100230104_WTVL' required in the 2026 horizon in both the existing and developed demand scenarios.
- Fire Flow – No additional minimum residual pressure non-compliances were observed in both the existing and developed scenarios across the assessed planning horizons. One additional max velocity non-compliance is observed as a result of the development, and is resolved following the opening of valve 'VCM_PI_11100230104_WTVL' required in the 2026 horizon in both the existing and developed demand scenarios.

Arcadis believe that the proposed development can be adequately serviced via the existing water network with no proposed augmentations following the opening of valve 'VCM_PI_11100230104_WTVL' in the 2026 horizon (open in the 2021 horizon and closed in the model in the 2026 horizon) and valve 'VCM_PI_11100364368_WTVL' in the 2036 horizon. The opening of these valves is required to achieve DSS compliance in both the existing and developed demand scenarios.

APPENDIX A

CoGC Correspondence

Please let me know should you need any further information.

Kind regards,
Swapan

From: JAHAN Syeda <SJAHAN@goldcoast.qld.gov.au>
Sent: Monday, 24 February 2025 4:03 PM
To: Djelovic, Gabby <Gabby.Djelovic@arcadis.com>
Cc: SAHA Uttam <USAHA@goldcoast.qld.gov.au>; GUERIN Phillip <PGUERIN@goldcoast.qld.gov.au>; SIKDER Swapan <SSIKDER@goldcoast.qld.gov.au>
Subject: RE: George Alexander Way

Hi Gabby.

Please find below the information requested for the subject lots.

- The demand applied in the WSSIP model from the subject lots can be found in the Table 1 below and additional EP from approved/conditioned developments to be considered in the modelling is shown in Table 2. Consider RMF pattern for approved developments.
- Please note that some new networks are missing in LGIP2 model and shape files of the network will be provided to allocate the additional demand from approved DAs in table 2.
- The lots are within 15 L/s fire flow demand map. The lots are zoned as '**High density /medium density residential'** in the City Plan 2015. Therefore, the fire flow provision should be 15 L/s.
- The location of the subject lots (in cyan colour boundary) with demand link (allocated demand node in model) is shown in Figure 1.
- The modelling should be reviewed using appropriate demand distribution as per servicing connection of the lot. IDM EP for the same lot as shown in Table 1 should be removed from its loading node. Pls assess the network until 2066 with the inclusion of approved EP from other DAs as given in Table 2.
- The George Alexander Way water network is part of the Foxwell Rd PMA with outlet PRV setting of 73m in the field. In model, the PRV setting is 63. Pls change the setting to 73m.
- The subject lot with demand link is shown in Figure 3.

Table 1: IDM2016 EP on the subject lot.

54 GEORGE ALEXANDER WAY			
96RP187418	EP	96RP187418_2	EP
RES_EP_WATER_2021	0	RES_EP_WATER_2021	0
RES_EP_WATER_2026	0	RES_EP_WATER_2026	0
RES_EP_WATER_2031	0	RES_EP_WATER_2031	0
RES_EP_WATER_2036	618.3686	RES_EP_WATER_2036	76.0489
RES_EP_WATER_2041	625.4222	RES_EP_WATER_2041	76.91638
RES_EP_WATER_2066	625.4222	RES_EP_WATER_2066	76.91638
VIS_EP_WATER_2016	0	VIS_EP_WATER_2016	0
VIS_EP_WATER_2021	0	VIS_EP_WATER_2021	0
VIS_EP_WATER_2026	0	VIS_EP_WATER_2026	0
VIS_EP_WATER_2031	0	VIS_EP_WATER_2031	0
VIS_EP_WATER_2036	265.015103	VIS_EP_WATER_2036	0
VIS_EP_WATER_2041	268.038089	VIS_EP_WATER_2041	0
VIS_EP_WATER_2066	268.038089	VIS_EP_WATER_2066	0
Loading Node in model	PI_11100439955_WTHY	Loading Node in Model	PI_11100366980_WTFT

Table 2: Additional demand to be included in the model from other approved DAs.

Address	LotPlan	2026	2031	2036	2041	2066	Connection Node
		Additional EP	Additional EP	Additional EP	Additional EP	Additional EP	
207 Foxwell Road/30 George Alexander Way	1SP296074, 25SP194232	678.2	558.21	494.1	492	492	See Figure1 below for the connection points
215 to 233 Foxwell Rd, Coomera, Urbana Development	24SP194261 and 23SP194262	Precint 1: 203.3, precinct 2: 356.8 & precinct 3: 1615.2	Precint 1: 203.3, precinct 2: 356.8 & precinct 3: 1615.2	Precint 1: 203.3, precinct 2: 356.8 & precinct 3: 1615.2	Precint 1: 203.3, precinct 2: 356.8 & precinct 3: 1615.2	Precint 1: 203.3, precinct 2: 356.8 & precinct 3: 1615.2	See Figure2 below for the connection points
41 George Alexander Way, Coomera Hospital	900SP207822	2072	2072	2072	2072	2072	PI_11100233249_WTFT

Figure 1: 207 Foxwell Road/30 George Alexander Way DA

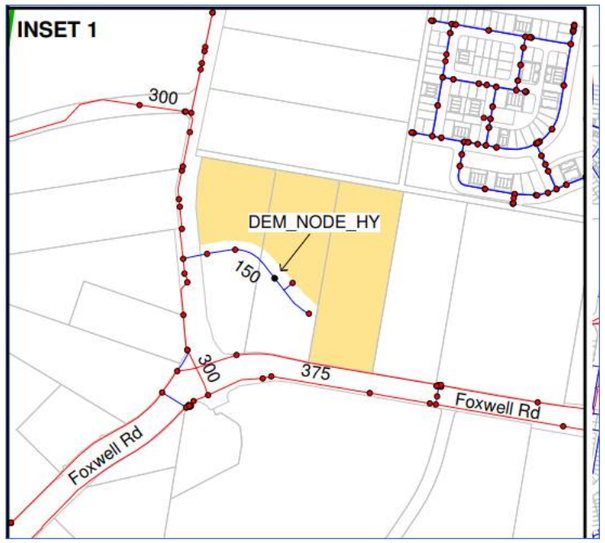


Figure 2: 215 to 233 Foxwell Rd, Coomera,

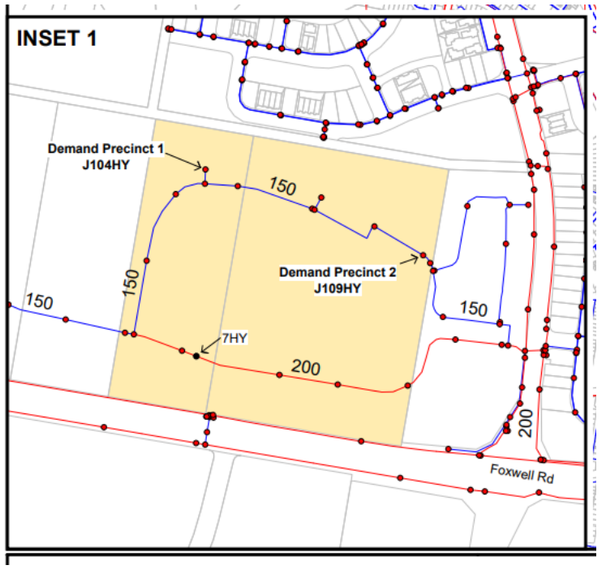
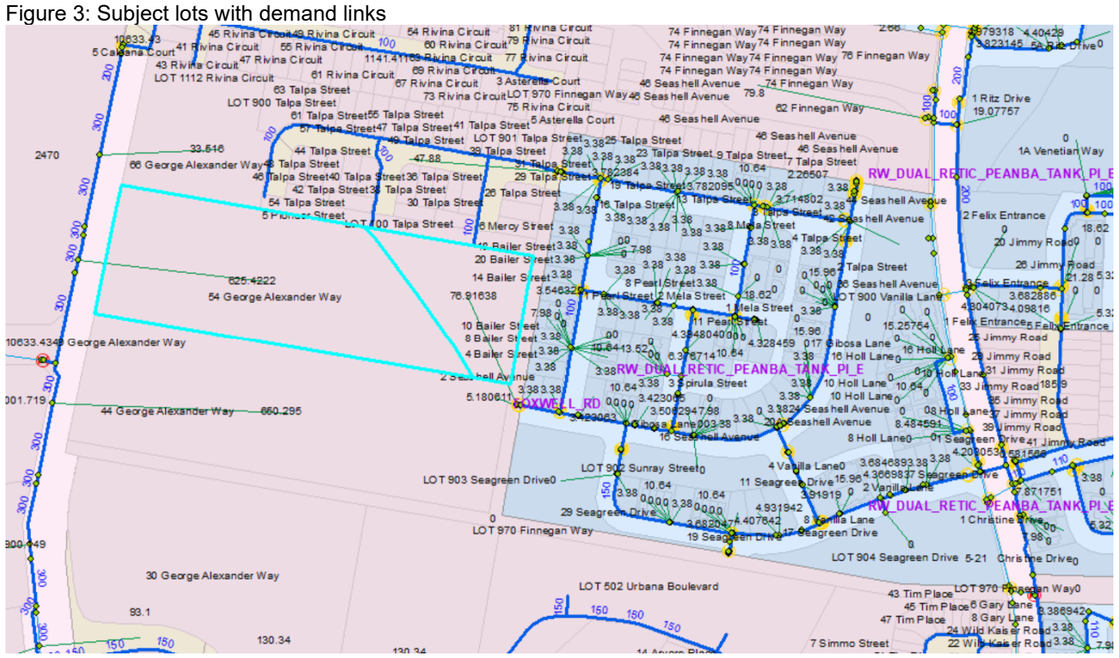


Figure 3: Subject lots with demand links



Pls feel free to contact if you have any query on that.

Regards,
Roshni

From: SAHA Uttam USAHA@goldcoast.qld.gov.au
Sent: Thursday, 20 February 2025 2:24 PM
To: JAHAN Syeda <SJAHAN@goldcoast.qld.gov.au>
Cc: GUERIN Phillip <PGUERIN@goldcoast.qld.gov.au>; Djelovic, Gabby <gabby.djelovic@arcadis.com>
Subject: FW: George Alexander Way

Hi Roshni,

Please respond to the following for water.

Regards Uttam

From: SAHA Uttam
Sent: Tuesday, 18 February 2025 2:31 PM
To: GUERIN Phillip <PGUERIN@goldcoast.qld.gov.au>
Subject: FW: George Alexander Way

Hi Phillip,

Can you please prepare information for the following request?

G:\SHARE\9 IP\06 ACTIVITIES\A-2014-1010\Development Assessment\54 George Alexander Way, COOMERA\water

Regards Uttam

From: Djelovic, Gabby <Gabby.Djelovic@arcadis.com>
Sent: Tuesday, 18 February 2025 11:45 AM
To: SIKDER Swapan <SSIKDER@goldcoast.qld.gov.au>; SAHA Uttam <USAHA@goldcoast.qld.gov.au>
Subject: George Alexander Way

Good afternoon,

We have been requested by Council to do a network capacity assessment for water and sewer, see the attached IR.

Could we please request the sewer and water information required to undertake capacity assessments for the following address?

- Lot 96 on RP 187418 (54 George Alexander Way, Coomera, QLD, 4209)

Let me know if there are any concerns.

Kind regards,

Gabby Djelovic
Civil Engineer – Urban Development & Regeneration
Arcadis Australia Pacific
Level 7 Seabank Building, 12-14 Marine Parade, Southport, QLD | 4215 | Australia
T +61 (0) 7 5503 4828 | M. + 61 (0) 420 345 367
Postal address – PO Box 1653, Southport QLD | 4215 | Australia
www.arcadis.com

I acknowledge and pay my respects to the Traditional Owners, Custodians and Elders past, present and emerging of the Indigenous Nations of Australia on whose lands I work

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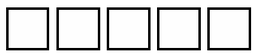

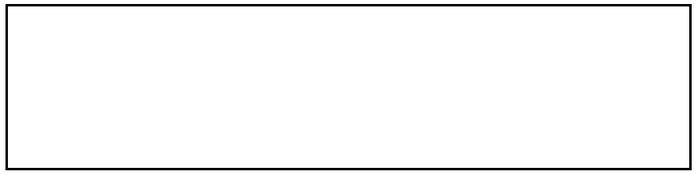

Council of the City of Gold Coast - confidential communication