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2 Karingal Drive, Pimpama

Water and Sewer Assessment

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Appendix A – Detailed Survey
Appendix B – Site Layout
Appendix C – SEQ WS&S D&C Code Failures (Water Supply)

1. Introduction

BJS Gets Richer Pty Ltd has engaged Burchills Engineering Solutions to prepare a Water and Sewer Assessment to be considered as part of a Development Application to the City of Gold Coast Council, for a proposed 71 lot multi-unit development at 2 Karingal Drive, Pimpama.

1.1 Objectives

This Water and Sewer Network Analysis will review Council's existing infrastructure and demonstrate the proposed development can be adequately serviced. The analysis will also model the demands and loadings from the proposed development and advise on any impacts it may have on the surrounding networks. The analysis will be undertaken in accordance with the current City of Gold Coast guidelines and the SEQ Water Supply and Sewerage Design and Construction Code (SEQ WSS D&CC).

1.2 Scope

Specifically, this report details the following:

- Investigation of the water network capacity;
- Review of the impact of the proposed development on the existing water network;
- Review of the impact of the proposed development on the future water network at multiple planning horizons, as defined by the Local Government Infrastructure Plan;
- Investigation of the sewer network capacity;
- Review of the impact of the proposed development on the existing sewer network; and
- Review of the impact of the proposed development on the future sewer network at multiple planning horizons, as defined by the Local Government Infrastructure Plan.

This report represents an assessment of the facts and circumstances pertaining to these matters, as they are known to the writer at the time of preparation.

2. Development Summary

2.1 Site Locality and Surrounding Land Use

The subject site is legally described as Lot 19 on RP 152380 and is located at 2 Karingal Drive, Pimpama. The site is generally rectangular and occupies an area of approximately 2.459 Ha.

The site to be developed is shown on the Site Layout Plan, prepared by Brian Johnston Plan Design, which is included within Appendix B of this report. A detailed site survey has been completed by Stewart McIntyre & Associates and is included within Appendix A of this report. The location of the subject site is shown on Figure 2.1, below.

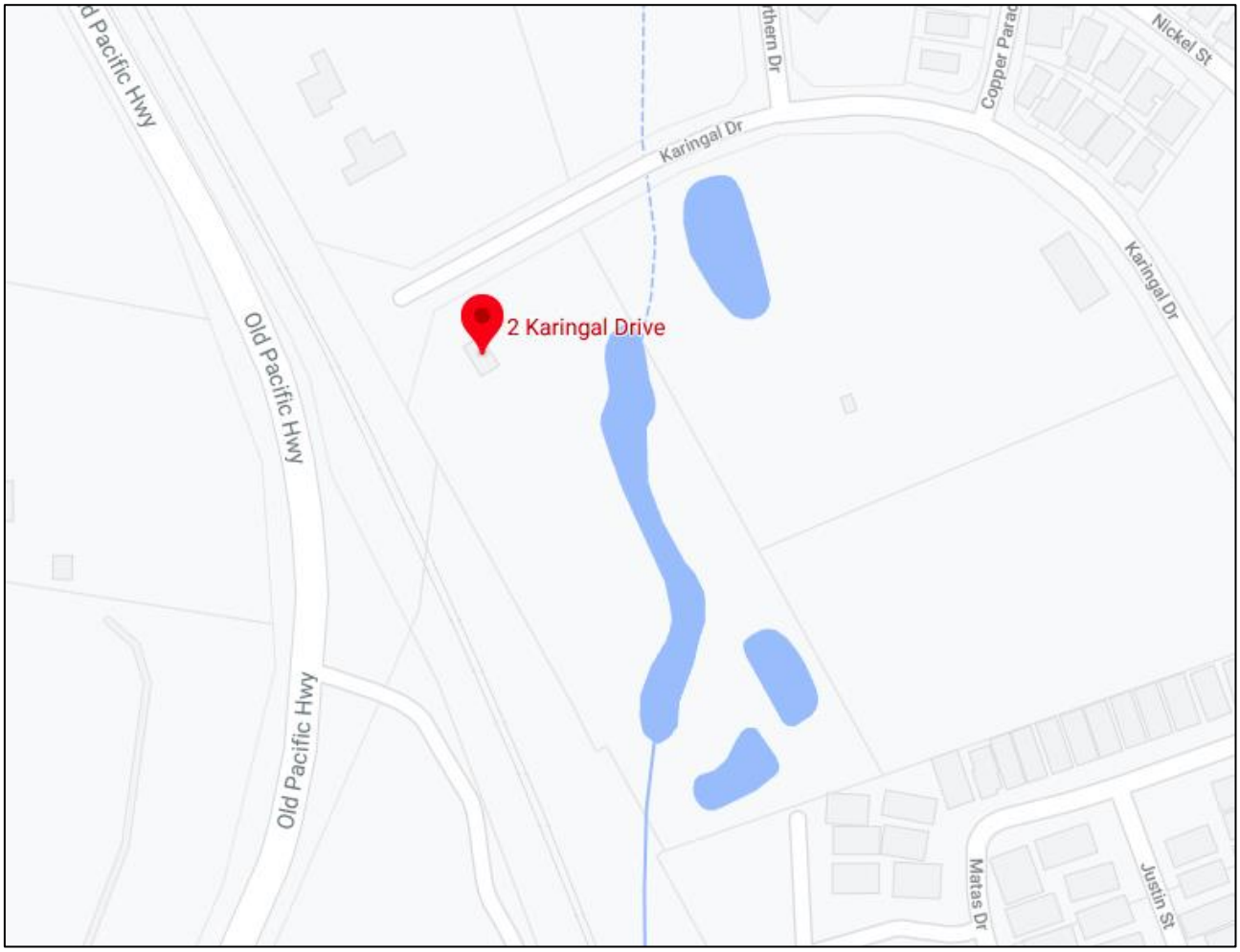


Figure 2.1 – Locality Plan

2.2 Proposed Development

The proposed development consists of 71 multi-unit residential townhouses to be established under a Community Title Scheme. The development proposes a series of internal private roadways and associated car parking; where the development is generally positioned around the central waterway.

The proposed Site Layout Plan is shown below in Figure 3.1, in reduced form and a full-scale drawing is included within Appendix B of this report.

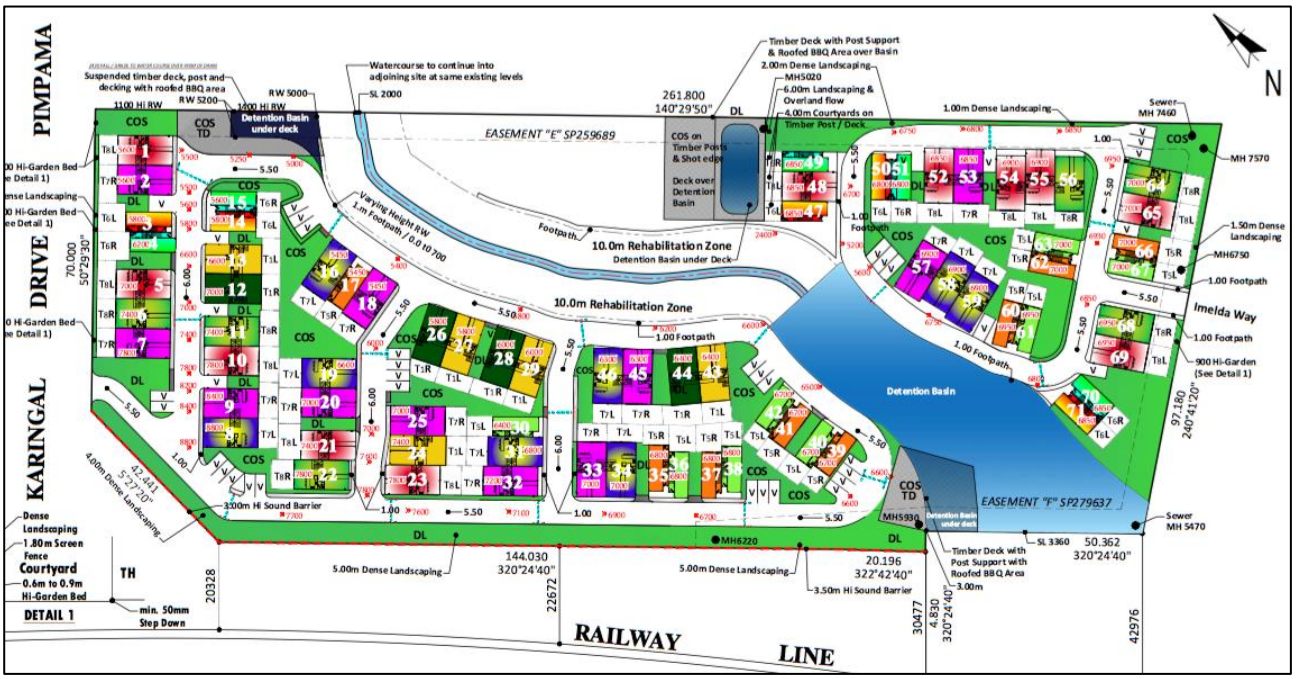


Figure 2.2 – Site Plan

Based on the SEQ Water Supply and Sewerage Design & Construction Code, the Equivalent Tenements (ET) and Equivalent Population (EP) for the proposed development is shown in Table 2.1.

Table 2.1 Development Summary

Use	Unit	Total Units	ET's/Unit	EP's/ET	Total ET	Total EP
Multi-Residential	3+ Bedrooms	71	0.9	2.73	63.9	174

3. Existing Infrastructure

3.1 Existing Water Network

The subject site is currently not serviced by Council's potable water network. There is an existing 150mm diameter water main on the site's frontage of Imelda Way, which is gravity supplied by the Peanba Park Rodge supply tanks (47 ML) approximately 3.5km to the southwest.

Figure 3.1 illustrates the existing water network as per Council's GIS database. All demands from the proposed development have been loaded to node PL_21010PIPE_11100488203_ENODE located on the 150mm water main on Karingal Drive. The parameters set within the GCW model will be used throughout this report.



Figure 3.1 – Existing Water Network

3.2 Existing Sewer Network

All sewage demands generated from the proposed development have been loaded to node SEMH_PA10_9000313897, along an existing DN375 main at the northern end of the site which gravity feeds approximately 4.7km to SPS PA10. Figure 3.2 illustrates the existing wastewater network as per Council's GIS Database. The sewerage impact assessment includes this gravity main from the proposed development loading node, down to the downstream sewerage pumping station (SPS) PA10.

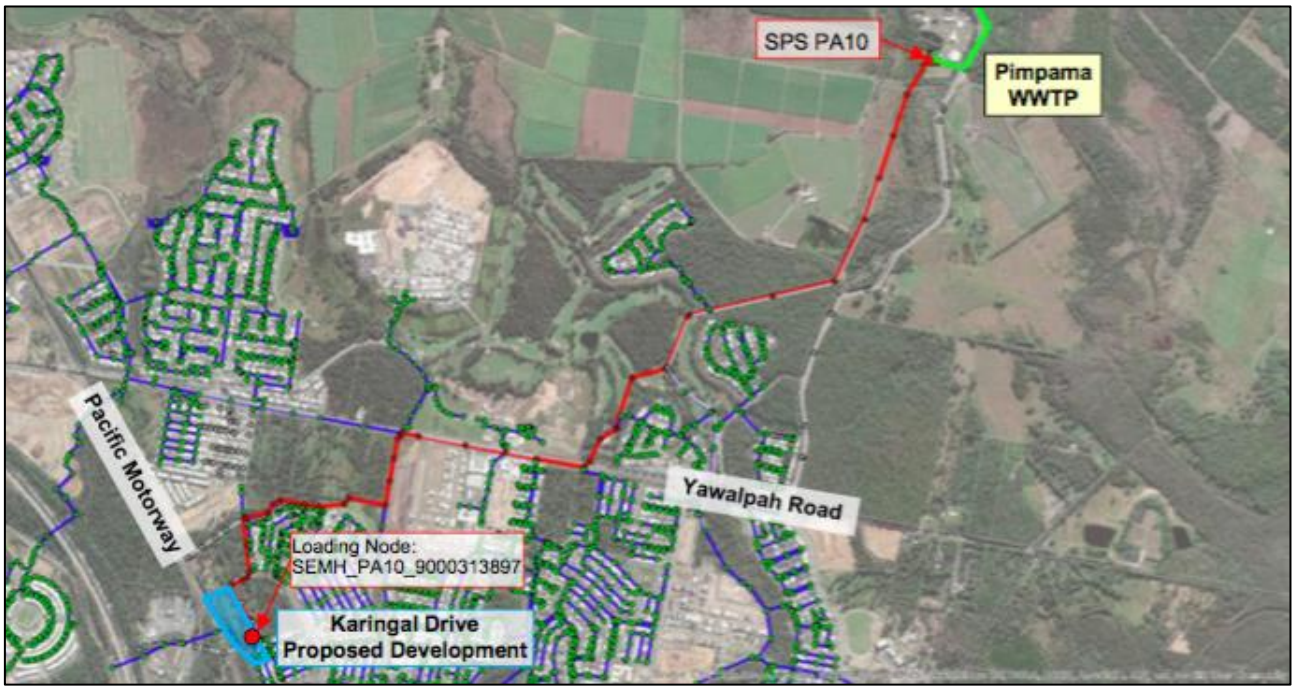


Figure 3.2 – Existing Sewerage Network

4. Proposed Water Reticulation

4.1 Development

There is an existing 150mm diameter water main on the site's frontage to Imelda Way. This 150mm water main will be utilised as the connection point for the subject site.

4.2 Water Demand Calculation

The sewer criteria and design parameters are based on the following references:

- Gold Coast Water (GCW) Desired Standards of Service (DSS);
- SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code); and
- Water Services Association of Australia – WSA 03-2013 Water Supply Code of Australia, Part 1: Planning and Design.

The service mains internal of each building will be designed and constructed in accordance with AS/NZS 3500.1:2003 Plumbing and Drainage – Water services (Standards Australia, 2003).

The water flow parameters shown in Table 4.1, 4.2 and 4.3 required to meet Council's Standards of Service and have been based on Single Supply (Drinking Water Only) Network parameters shown in SEQ Design Criteria Table 4.1.

Table 4.1 Potable Water Supply Demand and Peaking Factor

Property Type	Average Day Demand L/EP/day	Non-Revenue L/EP/day	Peaking Factors		
			MDMM	PD	PH
Commercial	220	20	1.06	1.12	2.32
Multi-Residential	220	20	1.27	1.45	2.97

Notes:

MDMM	Mean Day Maximum Month Demand
PD	Peak Day Demand
AD	Average Day Demand
PH	Peak Hour Demand

Table 4.2 Potable Water Pressure Parameters

Item	Pressure Parameter
Minimum Service Pressure	22 metres (adjoining the property boundary)
Maximum Service Pressure	Target 55 metres (at the property boundary) Max. 80 metres (subject to installation of pressure reducing valves)

Table 4.3 Fire Fighting Parameters

Item	Pressure Parameter
Minimum Residential Mains Pressure (Emergency Fire operating conditions)	12 metres at the operating hydrant Positive pressure elsewhere
Fire Flow Urban Residential	15 L/s for a duration of 2 hrs
Fire Flow Commercial	30 L/s for a duration of 4 hrs
Background Demand	2/3 x Peak Hour demand (not less than Average Day demand)

The following water flow projections have been estimated in accordance with the SEQ WS&S D&C Code. These projections have been compared to the City's 2019 WSSIP predicted demands and are presented in Table 4.4.

Table 4.4 Daily water flow projections

Site Loading	Land Use	Demand (EP)	Average Day (kL/d)	MDMM (kL/d)	Peak Day (kL/d)	Peak Hour (L/s)
Ultimate (2026) Demand (WWSIP)	Commercial	97	23.4	24.7	26.0	0.6
Proposed DA	Multi-Residential	174	41.7	52.0	58.98	1.35
TOTAL INCREASE		**77**	**18.3**	**27.3**	**32.98**	**0.75**

The daily water flow projections indicate that the proposed development is expected to increase the ultimate (2026) peak hour demand by approximately 0.75 L/s. It should be noted that no previously approved developments have been identified within the Pimpama-Jacobs Well DMA.

4.3 Network Modelling

4.3.1 Water Supply Network Assessment

The internal water supply network was not considered within this assessment. Therefore, all demands from the proposed development have been loaded to the nearest connection node (PI_21010PIPE_11100488203_ENODE) located on the existing DN150 main that runs along Imelda Way.

The proposed development is gravity supplied by the Peanba Park Road tanks (47 ML) approximately 3.5 km to the southwest. Figure 4.1 illustrates the extent of the Pimpama-Jacob's Well District Metered Area (DMA), within the greater Coomera / Pimpama Low Level Zone (LLZ).

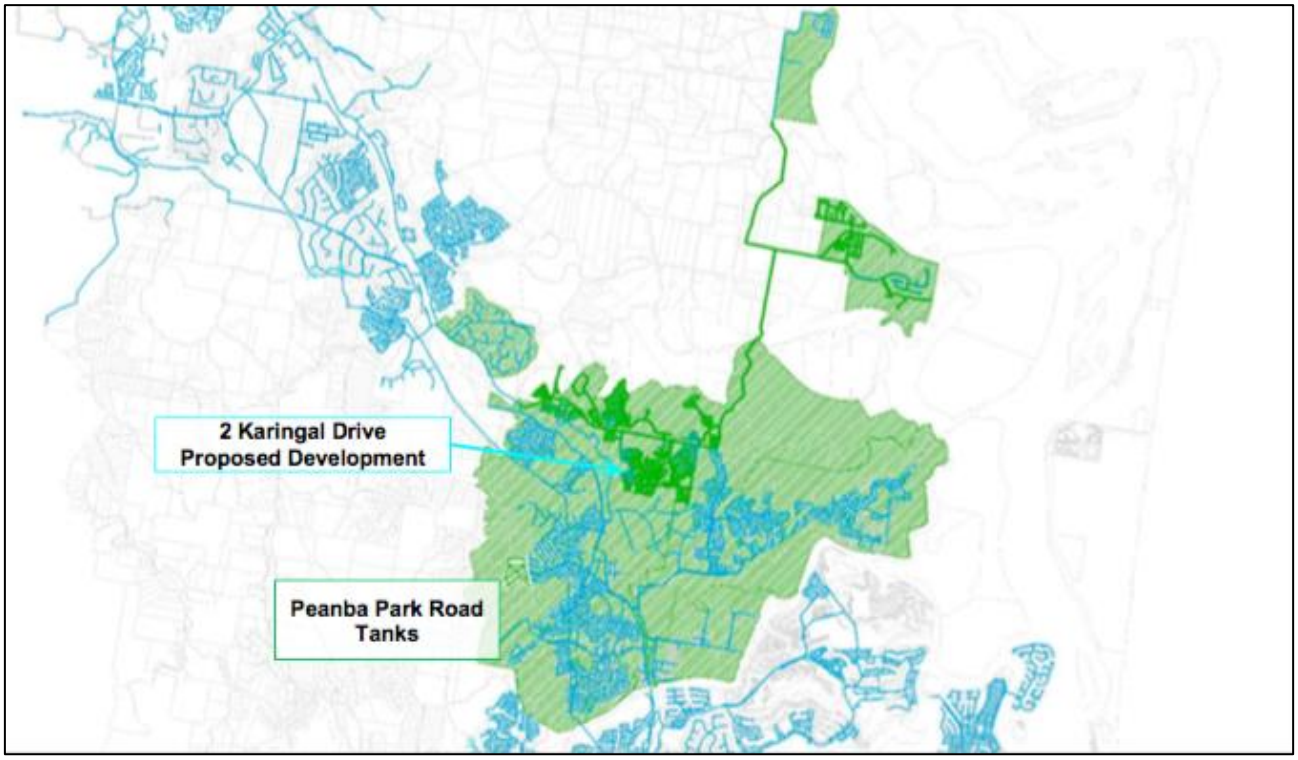


Figure 4.1 – Extent of greater Robina LLZ area assessed (highlighted in green)

4.3.2 Network Modelling

Hydraulic modelling of the water supply network was undertaken using the InfoWater model for the City's northern potable water network (Northern v95_WSSIP_2019) provided by the City. The hydraulic modelling was completed to evaluate system performance under existing (2021) and ultimate (2066) planning horizon flow conditions, both with and without the proposed development loading.

4.3.3 Reservoir Analysis

To ensure the Peanba Park Road tanks achieves the City's DSS recommended minimum of 15% depth, a 3-day extended simulation was run in accordance to SEQ WS&S D&C Code recommendations using the Maximum Day (MD) demand scenario within the network model.

Modelling results indicate that the existing (2021) through to ultimate (2066) network demand does not deplete the Peanba Park Road Tanks below the DSS of 15%.

4.3.4 Peak Hour Analysis

To determine peak hour minimum pressures and maximum network velocities, a 3-day standard flow analysis was run using the MD scenario within the network model. As detailed in the previous section, the flow control valve upstream of the Peanba Park Road Tanks was also amended for the purposes of this investigation as per advice from the City,

The results from the network peak hour analyses are detailed in Table 4.5 and Table 4.6.

Table 4.5 Peak Hour Minimum Pressures

Planning Horizon	Location	Peak Hour Minimum Pressure (m)			
		Existing	Failures	With Proposed Development	Failures
2021	PI_21010PIPE_11100488203_ENODE	57.3	-	56.5	-
	Pimpama-Jacobs Well DMA	24.3	-	23.6	-
2026	PI_21010PIPE_11100488203_ENODE	57.9	-	58.5	-
	Pimpama-Jacobs Well DMA	29.7	-	30.0	-
2031	PI_21010PIPE_11100488203_ENODE	44.1	-	44.0	-
	Pimpama-Jacobs Well DMA	23.8	-	23.7	-
2036	PI_21010PIPE_11100488203_ENODE	53.8	-	53.6	-
	Pimpama-Jacobs Well DMA	26.3	-	26.3	-
2041	PI_21010PIPE_11100488203_ENODE	47.6	-	47.3	-
	Pimpama-Jacobs Well DMA	27.3	-	27.0	-
2066	PI_21010PIPE_11100488203_ENODE	49.7	-	49.5	-
	Pimpama-Jacobs Well DMA	27.0	-	27.0	-

Modelling results indicate that both the existing (2021) and ultimate (2066) network have sufficient capacity to service the proposed development under peak hour demands while satisfying the SEQ WS&S D&C Code recommended minimum pressure of 22 m.

Table 4.6 Peak Hour Maximum Velocities

Planning Horizon	Location	Peak Hour Maximum Velocity (m/s)			
		Existing	Failures	with Proposed Development	Failures
2021	Pimpama-Jacob's Well DMA	1.7	-	1.7	-
2026		2.1	-	2.1	-
2031		2.3	-	2.2	-
2036		2.0	-	2.0	-
2041		2.0	-	2.0	-
2066		2.0	-	2.0	-

Note: No water mains under 10m in length were considered as part of this development.

Modelling results indicate that under all planning scenarios assessed, water mains assessed satisfy the SEQ WS&S D&C Code recommended maximum velocity of 2.5 m/s.

4.3.5 Fire Flow Analysis

Fire flow simulations were completed using the InfoWater Fireflow simulator and the 2/3 PH times noted within the model. Minimum fire flow residual pressures modelled at the nearest hydrant to the proposed development and greater Pimpama-Jacobs Well DMA are summarised in Table 4.7.

Table 4.7 Fire flow minimum residual pressures

Planning Horizon	Location	Fire Flow Minimum Residual Pressure (m)			
		Existing	Failures	w/ Proposed Development	Failures
2021	PI_11100488045_WTHY	50.4	-	49.4	-
	Pimpama-Jacobs Well DMA	-11.0	26	-11.0	26
2026	PI_11100488045_WTHY	51.9	-	50.8	-
	Pimpama-Jacobs Well DMA	5.4	1	4.9	1
2031	PI_11100488045_WTHY	38.0	-	36.8	-
	Pimpama-Jacobs Well DMA	-7.2	1	-7.8	1
2036	PI_11100488045_WTHY	48.0	-	46.9	-
	Pimpama-Jacobs Well DMA	3.4	4	3.2	4

2041	PI_11100488045_WTHY	44.4	-	43.5	-
	Pimpama-Jacobs Well DMA	4.9	6	-5.2	6
2066	PI_11100488045_WTHY	46.0	-	45.5	-
	Pimpama-Jacobs Well DMA	-16.7	9	-16.8	9

Note: 1) Fire flow pressure calculated in accordance to SEQ WS&S D&C Code recommendations at 2/3 PH demand with 15 L/s adopted for all nodes modelled in the proposed development hydrant.

The fire flow analysis indicates that the existing (2021) and ultimate (2066) networks have sufficient capacity to service the proposed development for fire flow demands with the with the nearest hydrant (PI_11100488045_WTHY) having adequate capacity to satisfy SEQ WS&S D&C Code recommended 12m minimum residual pressure.

However, within the greater Pimpama-Jacobs Well DMA, there are several hydrant failures under existing (2021) through ultimate (2066) demands (See Appendix A). As these failures occur prior to the addition of the demands from the proposed development, they are considered existing failures and are not significantly impacted by the proposed development.

4.4 Water Network Modelling Conclusion

Analysis of the water supply network has concluded that there is sufficient capacity in the existing (2021) and ultimate (2066) network to service the proposed development during peak hour and fire flow demand while satisfying SEQ WS&S D&C Code recommendations.

Within the greater Pimpama-Jacobs Well DMA, there are several locations where modelled water infrastructure supply does not meet the SEQ WS&S D&C Code recommendations. However, given this issue occurs prior to the proposed development demands, it is considered an existing failure and is not materially worsened by the proposed development.

It is suggested that the proposed development of up to 174 EP be approved with respect to adequate water supply network capacity.

5. Proposed Sewer Reticulation

5.1 Development

The sewerage impact assessment included the gravity main from the proposed development loading node SEMH_PA10_9000313897, to the downstream sewage pumping station (SPS) PA10.

5.1.1 Sewer Demand Calculation

The sewer criteria and design parameters are based on the following references:

- Gold Coast Water (GCW) Desired Standards of Service (DSS)
- SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code); and
- Water Services Association of Australia – WSA 02-2014 Sewerage Code of Australia, Part 1: Planning and Design.

The sewer flow generation, pipe design parameters, minimum sewer pipe grades and maximum capacity are shown below in Table 5.1, 5.2, 5.3 and 5.4. The following parameters are based on a Reduced Infiltration Gravity Sewer (RIGS):

Table 5.1 Sewer Flow Generation Parameters

Flow	Parameter
Average Dry Weather Flow (ADWF)	200 L/EP/d
Peak Dry Weather Flow (PDWF)	C_2 x ADWF where $C_2 = 4.7 \times (EP)^{-0.105}$
Peak Wet Weather Flow (PWWF)	5 x ADWF

Table 5.2 Pipe Design Parameters

Flow	Parameter
Mannings ‘n’	0.013
Minimum velocity @ PDWF	0.7 m/s
Depth of Flow @ PWWF – Existing system	Up to 1.0 m below MH cover level and no spillage through overflow structures
Depth of Flow @ PWWF – Proposed sewers	Max flow depth shall not exceed ¾ pipe full (75% d/D).

Table 5.3 Minimum Pipe Capacity – New Sewers Flowing ¾ Full

Pipe Size (mm)	Min Pipe Grade (1 in x)	Capacity (L/s)
150	180	10.4
225	300	23.6
300	400	44.1

Table 5.4 Maximum Rising Main Pipe Capacity

Pipe Size (mm)	Max Preferred Pipe Velocity (m/s)	Capacity (L/s)
125	1.5	18.4
150	1.5	26.51
200	1.5	47.12
250	1.5	73.63
300	1.5	106.03
375	1.5	165.67

Table 5.5 Wastewater flow, emergency and operating volume projections

Site Loading	Demand (EP)	ADWF (L/s)	PWWF (L/s)	Additional ES Required @ 4hrs (kL)
Ultimate (2066) WSSIP Demand	97	0.2	1.0	2.9
Proposed DA	174	0.4	2.0	5.76
2066 Total Increase	**77**	**0.2**	**1.0**	**2.86**
Existing (2021) Approved DA's	1,041	2.41	12.0	34.7

The analysis indicates that the proposed development is expected to increase the ultimate (2066) PWWF demands of the SPS PA10 catchment by approximately 1.0 L/s. It should be noted that there is also an additional existing (2021) demand of approximately 12.0 L/s PWWF from approved DA's in the SPS PA10 catchment.

5.2 Network Modelling

Hydraulic modelling of the wastewater network was undertaken using the InfoSWMM models for Pimpama (PI_WSSIP_2019) provided by the City, both with and without the proposed development loading. The hydraulic modelling was completed to evaluate system performance under existing (2021) through to the ultimate (2066) planning horizon flow conditions, including additional approved DA's, both with and without the proposed development loading.

5.3 Impact Assessment

5.3.1 Gravity Mains

Key profiles of the gravity network immediately downstream of the proposed development to SPS SS34 can be seen in Figure 5.1 and 5.2.

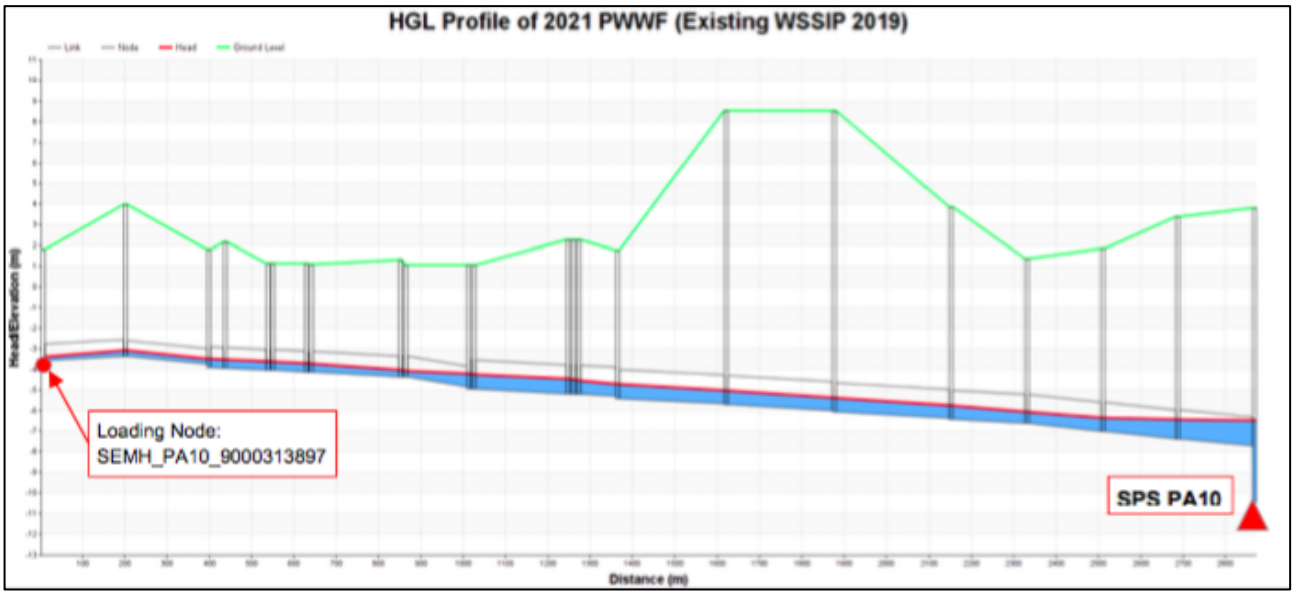


Figure 5.1 – Downstream gravity network under existing (2021) PWWF (Existing WSSIP 2019)

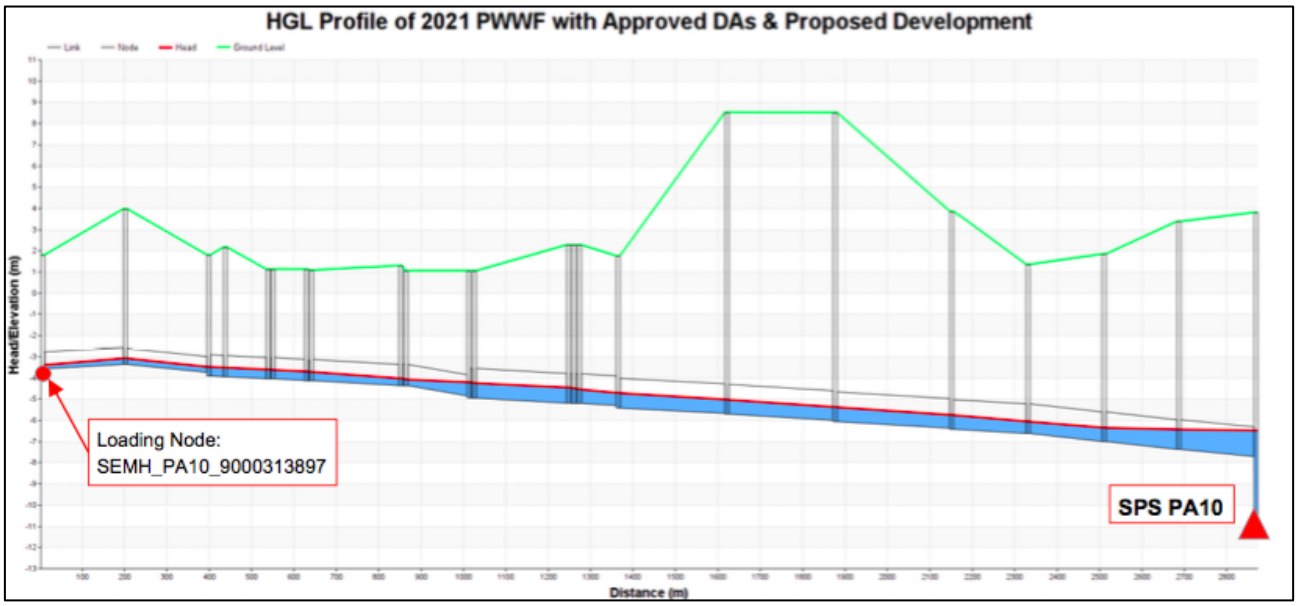


Figure 5.2 –Downstream gravity network under ultimate (2021) PWWF including demands from approved DA's and proposed development.

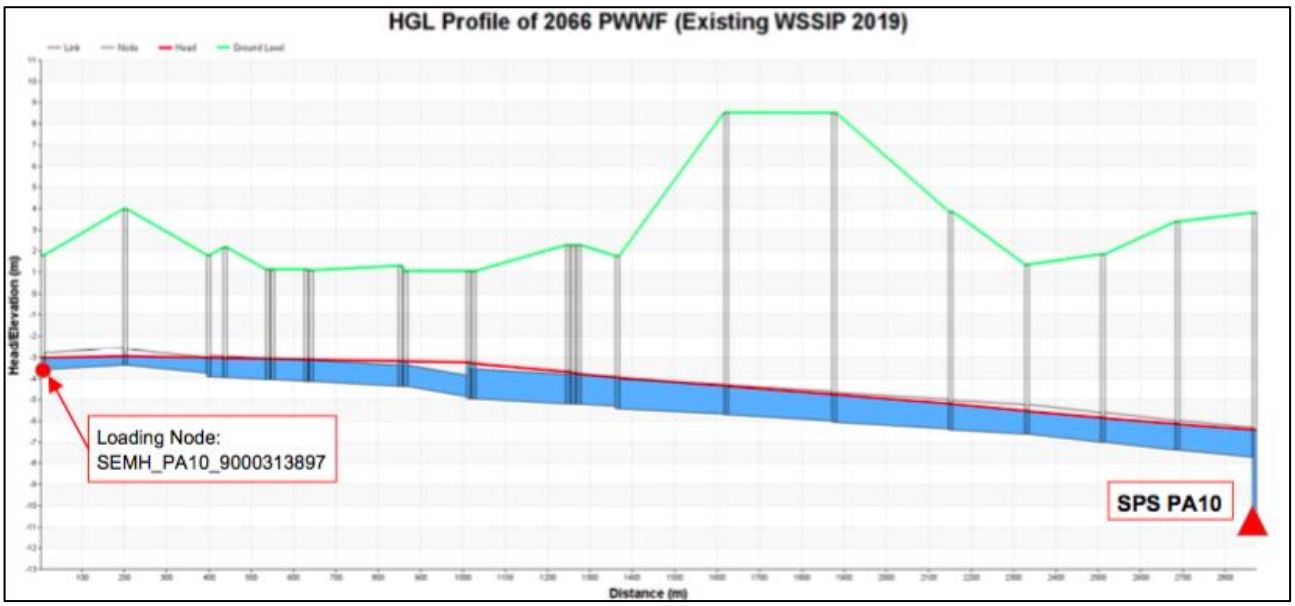


Figure 5.3 – Downstream gravity network under existing (2066) PWWF (Existing WSSIP 2019)

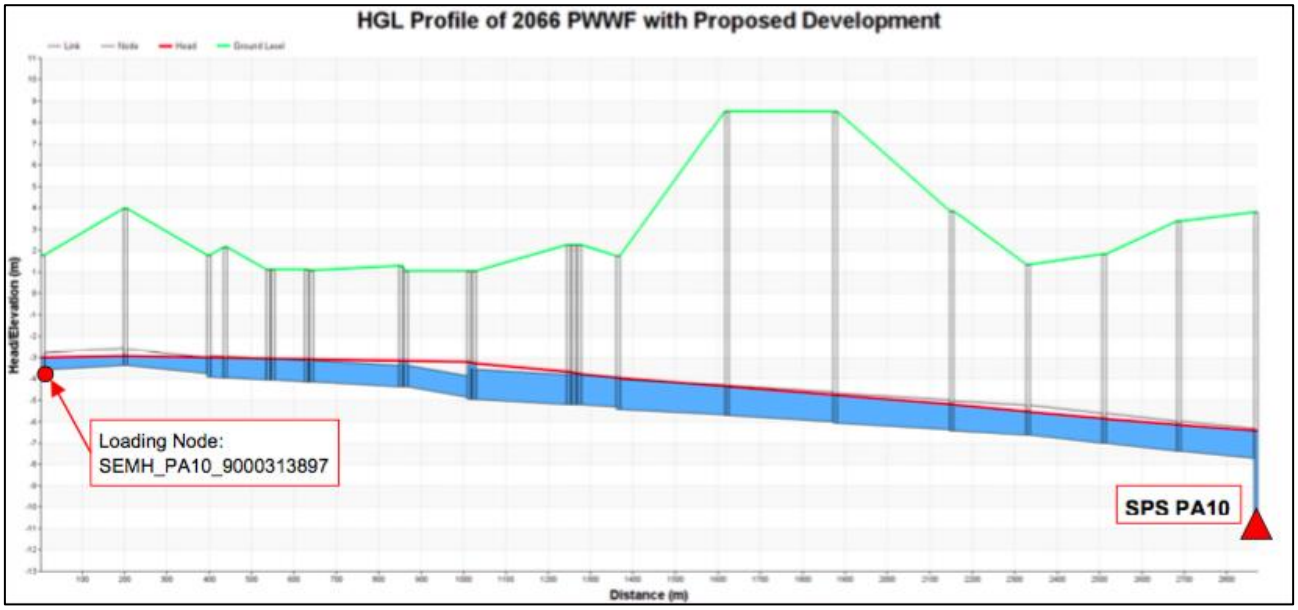


Figure 5.4 –Downstream gravity network under ultimate (2066) PWWF including demands from proposed development.

As illustrated in the gravity main profiles, the downstream sewer network adequately satisfies the GCW DSS of 1m freeboard and has sufficient capacity to service the proposed Karingal Drive development from existing (2021) demands through to ultimate (2066) planning scenario.

5.4 SPS PA10 Sewer Pump Station Analysis

A desktop assessment was completed using the demands nominated in the Pimpama wastewater network model, PI_WSSIP_2019, to ensure that the proposed development could be adequately serviced by the existing pump station (SPS PA10) and is summarised in the following sections:

5.4.1 Pump Capacity

Table 5.6 Flow requirements vs. existing capacity

Planning Horizon	Maximum Capacity (L/s)	PWWF (L/s)		
		Existing 2019 WSSIP	With Approved DA's	With Approved DA's & Proposed Development
Existing (2021)	1,371	847	859	861
2026	1,371	1,100	1,108	1,110
2031	1,500	1,416	1,421	1,423
2036	2,703	1,790	1,791	1,793
2041	2,703	2,080	2,080	2,082
Ultimate (2066)	2,703	2,326	2,326	2,326

Note: 1) SPS PA10 existing dual pumps capacity as per advice from the city.
2) Demands for PPWF Calculations obtained from the PI_WSSIP_2019 network model.

5.4.2 Operating Volume

Table 5.7 Operating volume requirements vs. existing capacity

Planning Horizon	Existing Capacity (m^3)	Operating Volume Required (kL)		
		Existing 2019 WSSIP	With Approved DA's	With Approved DA's & Proposed Development
Existing (2021)	156.2	44.4	45.1	45.2
2026		57.7	58.2	58.3
2031		74.4	74.6	74.7
2036		94.0	94.0	94.1
2041		109.2	109.2	109.3
Ultimate (2066)		135.7	122.1	122.1

Note: 1) SPS PA10 existing operating storage capacity obtained from email received from City of Gold Coast.
2) Demands for operating volume calculations obtained from the PI_WSSIP_2019 network model.

5.4.3 Rising Main

Table 5.8 Rising Main Velocities

Planning Horizon	Rising Main Internal Dia. (mm)	Velocity @ Ultimate (2066) PWWF (m/s)		
		Existing 2019 WSSIP[2]	With Proposed Development	With Approved DA's & Proposed Development
Existing (2021)	750	1.9	1.9	1.9
2026		2.5	2.5	2.5
2031		3.2	3.2	3.2
2036	975[2]	2.4	2.4	2.4
2041		2.8	2.8	2.8
Ultimate (2066)		3.1	3.1	3.1

Note: 1) Diameter obtained from the PI_SWWIP_2019 Network Model.
2) Combined rising main equivalent diameter calculated by WCS Engineering using $(D_1^{8/3} + D_2^{8/3})^{3/8}$

5.4.4 Emergency Storage

Table 5.9 Emergency storage requirements vs. existing capacity

Planning Horizon	Available Emergency Storage (kL)	Emergency Storage Required for 4hrs @ ADWF (kL)		
		Existing 2019 WSSIP	With Approved DA's	With Approved DA's & Proposed Development
Existing (2021)	6,718	976	976	979
2026	6,546	1,164	1,164	1,166
2031	6,348	1,487	1,487	1,489
2036	6,128	1,778	1,778	1,780
2041	5,971	2,151	2,151	2,153
Ultimate (2066)	5,865	2,496	2,496	2,498

Note: 1) SPS PA10 existing emergency storage volume obtained from email received from City of Gold Coast.
2) Demands for emergency storage calculations obtained from the PI_WSSIP_2019 network model.

The desktop assessment of SPS PA10 has concluded that the pump station has sufficient capacity to service the proposed development under existing (2021) demands through to the ultimate (2066) planning horizon.

However, in the ultimate (2066) planning horizon, combined rising main capacity also falls below the SEQ WS&S D&C Code recommended maximum velocity of 3 m/s. As this failure occurs prior to the

addition of the demands from the proposed development, it is considered an existing failure that is not significantly impacted by the proposed development.

Hydraulic analysis was undertaken using full network model runs for all scenarios to substantiate the desktop assessment findings and capacities noted within. Network modelling results confirm that SPS PA10 has sufficient capacity to service the proposed development through to the ultimate (2066) planning horizon.

5.5 Wastewater Network Modelling Conclusion

Analysis of the wastewater network has concluded that there is currently sufficient capacity within the existing (2021) and ultimate (2066) gravity network to service the proposed development while satisfying SEQ WS&S D&C Code recommendations.

It is suggested that the proposed development of approximately 174 EP be approved with respect to adequate wastewater network capacity.

6.0 References

1. City of Gold Coast (COGC), 2011. “Gold Coast Planning Scheme Policy 11 – Land Development Guidelines”
2. South East Queensland Water (SEQ), 2013. “SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code)”
3. Water Services Association of Australia (WSAA), 2014. “Sewerage Code of Australia (WSA 02-2014)”
4. Water Services Association of Australia (WSAA), 2011. “Water Supply Code of Australia (WSA 03-2011)”

Appendix A – Detailed Survey

DRIVE

KARINGAL

20 RP152380

21 RP152380

13 SP259688

16 SP259688

17 SP259688

902 SP259688

19
RP152380
2.459 ha

1 SP135200

62 SP109417

EASEMENT E SP259689

EASEMENT F SP279637

DIRECTION OF WATER FLOW

DIRECTION OF WATER FLOW

DIRECTION OF WATER FLOW

IMELDA WAY

CREEK

CREEK

DAM

DAM

SWAMP

Brick Dwelling

Concrete Tanks

Concrete Slab

Shed

Shed

STOCKPILE

Adjoining Dwelling

Culvert

Concrete Culvert

3x 1.75m Dia RCP

Invert Levels

Invert Level RL 5.24

Wire Fence

G.I. Fence

Edge of Bitumen

TOP OF BANK

WATERLINE

OVERHEAD POWER

SITE BENCHMARK
SPIKE IN BITUMEN
RL 9.59 AHD DERIVED

SPIKE

Scale 1:400
0m 10m 20m

RAILWAY LINE

SEWER LINE	MH - MANHOLE
FENCE LINE	PIT - SEWERAGE INSPECTION PIT
TELECOM CABLE	TELE - TELECOM PIT
UNDERGROUND POWER	ELEC - ELECTRICAL PIT
OVERHEAD POWERLINE	PP - POWER POLE
GAS MAIN	ELP - ELECTRIC LIGHT POLE
WATER MAIN	V - VALVE
ROUND CONCRETE PIPE	FH - FIRE HYDRANT
	GT - GULLY TRAP
	TREE
	FL - FLOOR LEVEL
	WM - WATER METER

THE SURFACE EXPRESSION OF THE SERVICES SHOWN ON THIS PLAN HAVE BEEN LOCATED BY FIELD SURVEY.
PRIOR TO DEMOLITION , EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.

STEWART McINTYRE & ASSOCIATES P/L
CONSULTING SURVEYORS
21 PHILIPPINE PARADE
PALM BEACH, QLD. 4221
PHONE 55983334 FAX 55981522

TITLE: CONTOUR AND DETAIL SURVEY OVER LOT 19 ON RP152380

PARISH OF PIMPAMA COUNTY OF WARD

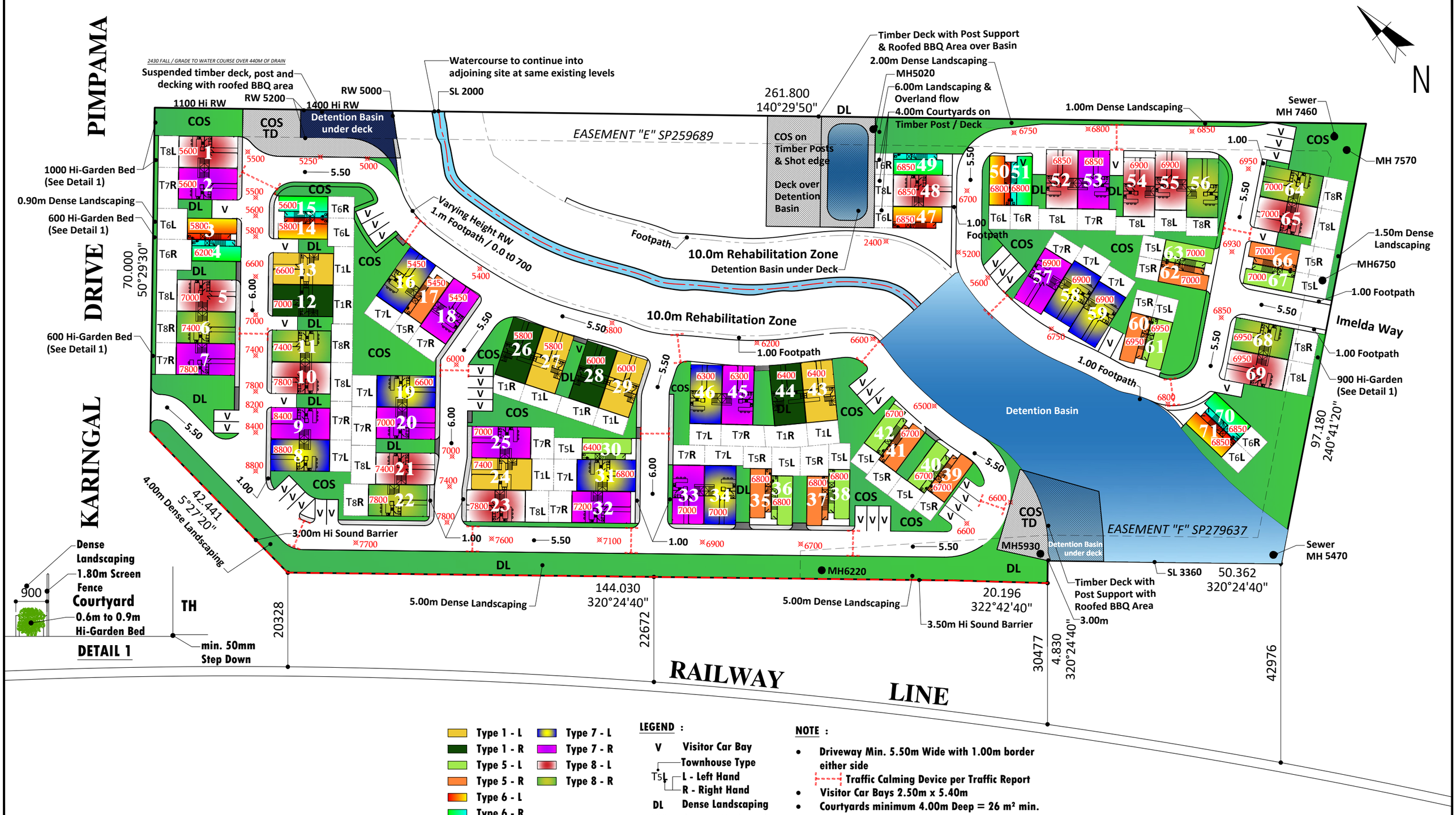
CLIENT: EA INVEST PTY LTD.

SURVEYOR	DATE
AF	19/05/17
DRAWN	FIELD BOOK
AF	
COMFILE 17943PM	
DRAWING NO. DWG17943	

SCALE 1:400

LEVEL DATUM AHD DERIVED
PSM191892 RL 8.662m AHD

Appendix B – Site Layout



Type 1 - L
Type 1 - R
Type 5 - L
Type 5 - R
Type 6 - L
Type 6 - R
Type 7 - L
Type 7 - R
Type 8 - L
Type 8 - R

LEGEND :

- V — Visitor Car Bay
- T5L — Townhouse Type; L - Left Hand; R - Right Hand
- DL — Dense Landscaping
- COS — Community Open Space
- TD — Timber Deck

NOTE :

- Driveway Min. 5.50m Wide with 1.00m border either side
  - Traffic Calming Device per Traffic Report
- Visitor Car Bays 2.50m x 5.40m
- Courtyards minimum 4.00m Deep = 26 m² min.

Total Area (sqm) : 24,592

Dence Landscaping = 1,566 sqm
Community Open Space = 3,174 sqm
20.0m Rehabilitation Zone = 4,118.19 sqm
Timber Deck = 1414 sqm

NOTE :
HRV / GARBAGE TRUCK MANOEUVRING MIN. 10.5m KERB TO KERB PER J.J. RICHARDS DESIGN

1:750
15m 0 15m 30m 45m 60m 75m

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Verify all dimensions on site and from the dimension on the plans. Do not scale from drawings

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Brian Johnston Plan Design Pty Ltd - BLD 216547
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Design, Building, Civil Works.

Drawn by
John C.

Checked by
JPD, Brian Johnston plan design P/L

Client

SITE LAYOUT

RAY SUGARS
2 Karingal Drive Pimpama
Lot 19 on RP 152380

Drawing Scale
1:750

Layout ID
JPD-P24-KDP-01

Status

Paper Size
@A3

Appendix C – SEQ WS&S D&C Code Failures (Water Supply)

Fire Flow Failures

2021 Existing LGIP	
ID	Residual Pressure (m)
PI_11100260348_WTHY	-11.03
PI_11100387533_WTHY	-9.77
PI_11100113895_WTHY	-7.92
PI_11100113740_WTHY	-1.08
PI_11100443066_WTHY	-1.07
PI_11100113976_WTHY	-1.06
PI_11100234961_WTHY	0.10
PI_11100085279_WTHY	0.61
PI_11100234911_WTHY	0.65
PI_11100443134_WTHY	1.70
PI_11100234951_WTHY	2.71
PI_11100085271_WTHY	3.09
PI_11100260304_WTHY	3.40
PI_11100443093_WTHY	3.44
PI_11100387279_WTHY	4.14
PI_11100443113_WTHY	4.34
PI_11100113357_WTHY	5.25
PI_11100387206_WTHY	5.50
PI_11100234921_WTHY	5.54
PI_11100113713_WTHY	5.89
PI_11100387214_WTHY	6.01
PI_11100387259_WTHY	6.23
PI_11100113727_WTHY	6.33
PI_11100375418_WTHY	6.64
PI_11100234971_WTHY	7.47
PI_11100234996_WTHY	9.96

2021 w/ Proposed Development	
ID	Residual Pressure (m)
PI_11100260348_WTHY	-11.03
PI_11100387533_WTHY	-9.77
PI_11100113895_WTHY	-7.92
PI_11100113740_WTHY	-1.08
PI_11100443066_WTHY	-1.07
PI_11100113976_WTHY	-1.06
PI_11100234961_WTHY	0.10
PI_11100085279_WTHY	0.61
PI_11100234911_WTHY	0.65
PI_11100443134_WTHY	1.70
PI_11100234951_WTHY	2.71
PI_11100085271_WTHY	3.09
PI_11100260304_WTHY	3.40
PI_11100443093_WTHY	3.44
PI_11100387279_WTHY	4.14
PI_11100443113_WTHY	4.34
PI_11100113357_WTHY	5.25
PI_11100387206_WTHY	5.50
PI_11100234921_WTHY	5.54
PI_11100113713_WTHY	5.89
PI_11100387214_WTHY	6.01
PI_11100387259_WTHY	6.23
PI_11100375418_WTHY	6.24
PI_11100113727_WTHY	6.33
PI_11100234971_WTHY	7.47

2021 w/ Proposed Development	
ID	Residual Pressure (m)
PI_11100234996_WTHY	9.96

2026 Existing LGIP	
ID	Residual Pressure (m)
PI_11100375418_WTHY	5.40

2026 w/ Proposed Development	
ID	Residual Pressure (m)
PI_11100375418_WTHY	4.91

2031 Existing LGIP	
ID	Residual Pressure (m)
PI_11100375418_WTHY	-7.20

2031 w/ Proposed Development	
ID	Residual Pressure (m)
PI_11100375418_WTHY	-7.76

2036 Existing LGIP	
ID	Residual Pressure (m)
PI_11100260348_WTHY	3.39
PI_11100375418_WTHY	3.56
PI_11100387533_WTHY	9.61
PI_11100113895_WTHY	11.59

2036 w/ Proposed Development	
ID	Residual Pressure (m)
PI_11100375418_WTHY	3.18
PI_11100260348_WTHY	3.39
PI_11100387533_WTHY	9.61
PI_11100113895_WTHY	11.59

2041 Existing LGIP	
ID	Residual Pressure (m)
PI_11100260348_WTHY	-4.85
PI_11100375418_WTHY	3.44
PI_11100113976_WTHY	5.14
PI_11100387533_WTHY	6.87
PI_11100113895_WTHY	8.85
PI_11100260304_WTHY	9.55

2041 w/ Proposed Development	
ID	Residual Pressure (m)
PI_11100260348_WTHY	-5.16
PI_11100375418_WTHY	3.17
PI_11100113976_WTHY	4.83
PI_11100387533_WTHY	6.54
PI_11100113895_WTHY	8.52
PI_11100260304_WTHY	9.25

2066 Existing LGIP	
ID	Residual Pressure (m)
PI_11100260348_WTHY	-16.74
PI_11100387533_WTHY	-7.34
PI_11100113976_WTHY	-6.82
PI_11100113895_WTHY	-5.38
PI_11100260304_WTHY	-2.20
PI_11100113740_WTHY	2.16
PI_11100375418_WTHY	5.65
PI_11100387279_WTHY	9.53
PI_11100113942_WTHY	11.98

2066 w/ Proposed Development	
ID	Residual Pressure (m)
PI_11100260348_WTHY	-16.84
PI_11100387533_WTHY	-7.45
PI_11100113976_WTHY	-6.92
PI_11100113895_WTHY	-5.49
PI_11100260304_WTHY	-2.31
PI_11100113740_WTHY	2.05
PI_11100375418_WTHY	5.52
PI_11100387279_WTHY	9.42
PI_11100113942_WTHY	11.88