



FINAL PRECINCT NETWORK PLAN (FPNP)

AURA PRECINCT 13

Prepared for **Stockland Development Pty Ltd**



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EXECUTIVE SUMMARY

This Final Precinct Network Plan (FPNP) covers Precinct 13 of the proposed Aura development. The development is located within the Sunshine Coast Council (SCC) local government area with Unitywater the responsible distributor-retailer water authority.

As outlined on the RPS draft layout concept (Drawing No. 17546-03 Rev N) within Appendix A, Precinct 13 will consist entirely of non-residential land use, primarily low impact industrial and commercial. A maximum demand of 1,431 EP is projected for the proposed development.

The approved Infrastructure Master Plan (IMP) developed by WSP Parsons Brinckerhoff (PB) forms the basis of overarching trunk infrastructure service strategies for Aura. The plan was used to inform the planning of the IA and remains a reference document that is to be updated as the development progresses. Since the publication of the approved IMP (2016), development demands and growth projections have changed significantly, along with associated infrastructure servicing strategies for individual precincts. Accordingly, Egis has prepared and submitted a revised Aura and Aura South Water & Wastewater Infrastructure Master Plan Report (Revised IMP), No 21-00307.06-WER01-Rev C (Egis, June, 2022). This study is based on updated information available from the Revised IMP as well as other approved reports detailed in Section 1.4.

Consistent with the Revised IMP, the following planning horizons have been considered when assessing Precinct 13. The primary change being the bringing forward of Precinct 13 into earlier planning horizons, with initial development occurring in Phase 2 (250 EP) and ultimate demands (1,431 EP) forecast for Phase 3.

- Phase 1: 0 - 22,000 EP
 - No development within Precinct 13
- Phase 2: 22,001 – 30,000 EP
 - Precinct 13 partially developed with 250 EP
- Phase 3: 30,001 – 45,000 EP
 - Precinct 13 fully developed with 1,431 EP
- Phase 4: 45,001 – 60,000 EP
 - Precinct 13 fully developed with 1,431 EP
- Phase 5: 60,000 EP - 85,284 EP (88,137 EP for wastewater)¹
 - Precinct 13 fully developed with 1,431 EP

The network models provided by Unitywater differ from those adopted for previous precinct network planning. Specifically, the preferred modelling platforms have transitioned to InfoWorks WS Pro and InfoWorks ICM, with the current models supplied in these formats. In addition, the models have been developed using planning year horizons rather than population-based horizons as previously described. Although the current models differ from those used in earlier planning assessments, they represent the latest endorsed versions provided by Unitywater and are considered appropriate for the assessment of Precinct 13.

The estimated population for Precinct 13 is 669 EP lower than the revised IMP projection. As a result, it is considered that the previously identified external trunk infrastructure planning allowances remain sufficient to service Precinct 13. Accordingly, no additional external network performance assessment has been undertaken, on the basis that the projected Precinct 13 population remains below the revised IMP planning assumptions.

This includes 132 EP associated with Lot 857 located within Precinct 14, as there may be a future change in land use which requires this lot to be serviced through Precinct 13. On this basis, network modelling has considered additional demand from Lot 857 to ensure adequate capacity is provided.

¹It should be noted that the Ultimate wastewater planning strategy allows a total of 88,137 EP due to the broad hectare EP factors adopted for non-residential demands

To service Precinct 13, the following internal water and wastewater infrastructure is required. It is assumed that external trunk infrastructure throughout the broader Aura development will be constructed and operational in line with previous network planning and staging.

- DN200 water main connection to existing DN800 watermain along Central Avenue, supplying a dual DN150 water reticulation network throughout Precinct 13 to support commercial and industrial development as shown in Figure 4-5.
- DN250 gravity sewer extending from Precinct 13 and connecting into the existing DN355 stub at MH5365191, located immediately east in Precinct 12. DN160 internal gravity sewers servicing Precinct 13 and connected to the DN250 gravity sewer as shown in Figure 5-3.

Water & wastewater network modelling for the development demonstrates that the proposed service strategies are suitable for supporting the ultimate development demands under each planning horizon. It is recommended that the strategies proposed within this Final Precinct Network Plan be adopted for Precinct 13.

ABBREVIATIONS AND ACRONYMS

ABBREVIATIONS AND ACRONYMS	
ABBREVIATION / ACRONYM	DESCRIPTION
AD	Average Day Demand (Water)
ADWF	Average Dry Weather Flow (Sewage)
DMA	District Metering Area
DN	Diameter Nominal
DSS	Desired Standards of Service
EDQ	Economic Development Queensland
EP	Equivalent Person
FPNP	Final Precinct Network Plan
GFA	Gross Floor Plan
IA	The Caloundra South Infrastructure Agreement (water and
IMP	Caloundra South Water Supply & Sewerage Infrastructure Master Plan, Parsons Brinckerhoff, Rev F, 4 August 2016
m	Metres
m²	Square Metres
MD	Maximum Day (Water), known also as PD
MDMM	Mean Day Maximum Month (Water)
MH	Maximum Hour (Water), known also as PH
MEDQ	Minister for Economic Development Queensland
NRW	Non-Revenue Water
PB	Parsons Brinckerhoff
PD	Peak Day (Water), known also as MD
PDWF	Peak Dry Weather Flow (Sewage)
PH	Peak Hour (Water), known also as MH
PoD	Plan of Development
PPNP	Preliminary Precinct Network Plan
PWWF	Peak Wet Weather Flow (Sewage)
Revised IMP	Aura and Aura South Water & Wastewater Infrastructure Master Plan Report, Egis, Rev C, 14th June 2022)

SEQ Code	SEQ Code South East Queensland Water Supply and Sewerage Design & Construction Code
WSAA	Water Services Association of Australia
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

Egis Consulting Pty Ltd (Egis) has been engaged by Stockland Development Pty Ltd to prepare the Water and Wastewater Final Precinct Network Plan (FNP), as per Clause W3 of the Unitywater Caloundra South Infrastructure Agreement (IA). The development includes Precinct 13 of the proposed Aura development. The proposed development is located within the Sunshine Coast Council (SCC) local government area with Unitywater the responsible distributor-retailer water authority.

As outlined on the RPS draft layout concept (Drawing No. 17546-03 Rev N) within Appendix A, Precinct 13 is located directly west of Precinct 12 and north of Central Avenue. The development will consist entirely of non-residential land use, primarily low impact industrial and commercial, with a maximum demand of 1,431 EP projected for the proposed development.

Trunk water and wastewater infrastructure have been adopted generally in accordance with the Parsons Brinckerhoff Caloundra South Water Supply & Sewerage Infrastructure Master Plan (IMP) report No 2114554F-REP-Rev F (4 August 2016) and existing Precinct Network Plan Reports. The approved Infrastructure Master Plan (IMP) developed by WSP Parsons Brinckerhoff (PB) forms the basis of overarching trunk infrastructure service strategies for Aura. The plan was used to inform the planning of the IA and remains a reference document that is to be updated as the development progresses. Since the publication of the approved IMP (2016), development demands and growth projections have changed significantly, along with associated infrastructure servicing strategies for individual precincts. Accordingly, Egis has prepared and submitted a revised Aura and Aura South Water & Wastewater Infrastructure Master Plan Report (Revised IMP), No 21-00307.06-WER01-Rev C (Egis, June, 2022). This study is based on updated information available from the Revised IMP as well as other approved reports detailed in Section 1.4.

The primary objective of this investigation is to confirm network demands and determine appropriate staging of water and wastewater servicing strategies in support of the Precinct 13 development.

1.1 Infrastructure Agreement

The site is subject to 'The Caloundra South Infrastructure Agreement (Water and Wastewater Infrastructure)'. The Infrastructure Agreement (IA) was executed between Stockland, Minister for Economic Development Queensland (MEDQ) and Unitywater on 20 March 2017 for the development of water supply and sewerage infrastructure within the entire Aura development.

The IA sets out the requirements for the approval process, including the submission of a Final Precinct Network Plan (FNP).

1.1.1 Precinct Network Plan Requirements

The requirements for this FNP, as set out under Clause W2.3 of the IA, and the corresponding report sections are summarised in TABLE 1-1 below.

TABLE 1-1: PRECINCT 13 INFRASTRUCTURE AGREEMENT REQUIREMENTS

IA REQUIREMENTS		
IA ITEM	REQUIREMENT	REPORT SECTION
W2.3 (a)	A description of the land to which the Final precinct network plan applies.	Section 1.2
W2.3 (d) (i)	A preliminary assessment of the impact the Planned Demand within the Precinct will have on the Infrastructure Master Plan.	Section 0; Section 0; Section 5

W2.3 (d) (ii)	A preliminary assessment of the impact of the Planned Demand for the Precinct on the Level of Service to existing development and future development under any Final Precinct Network Plans within the Master Plan Priority Development Area.	Section 0; Section 5
W2.3 (d) (iii)	A preliminary assessment of the additional Planned Demand from other Adjoining Precincts that will be serviced by Infrastructure Categories provided within the Precinct.	Section 0; Section 0; Section 5
W2.3 (f)	An assessment, supported by network modelling, of the sizing and layout of water supply infrastructure, being part of the Infrastructure Categories to demonstrate capacity to service all Lots within the Precinct.	Section 0
W3.4 (a)	All of the information required under clause W2 to be included in a Final precinct network plan (or, if the application relates to a part of a Precinct, all of the information that would be required to be included in a Final precinct network plan for that part), with any proposed changes to the Lot layout or Works Contributions.	Inclusive as per the above
W2.3 (b) / W3.4 (b)	Proposed Lot layout identified in the Plan of Development or other plan of proposed development for the Precinct, including the EP Plan for each Lot.	Section 1 & 0; Appendix A
W3.4 (c)	Plan view engineering plans for the Works Contributions required to service all Lots within the Precinct (or relevant part thereof), including detail about pipe sizes.	Section 0; Section 5
W2.3 (e) / W3.4 (e)	Detailed plans and longitudinal sections based on estimates of finished surface levels, for any control and trunk sewers servicing future development external to the relevant Precinct (or relevant part thereof).	Section 5
W3.4 (d)	The proposed timing and sequencing of development within the Precinct (or relevant part thereof).	Section 1
W3.4 (f)	Any infrastructure staging that may be required for the sequencing of development within the Precinct (or relevant part thereof), or any temporary servicing infrastructure that may be required for reasons including water quality control and sewage odour control.	Section 0; Section 5
W3.4 (g)	A hydraulic assessment of the sewer network to determine the preferred location of any required sewer overflow structures.	Section 5
W3.4 (h)	An assessment of the impact the Planned Demand for the relevant Precinct (or relevant part thereof) will have on the existing or Approved Infrastructure Categories.	Section 0; Section 5
W3.4 (i)	Layout of proposed district metering areas in accordance with Unitywater's requirements.	Section 0
W3.4 (j)	A statement about the Land Contributions and Works Contributions in the Infrastructure Contributions Schedule that are required for the Precinct (or relevant part thereof), including a schedule identifying the Works Contributions required to service each stage within the Precinct (or relevant part thereof).	Section 6

W2.3 (c) / W3.4 (k)	A statement of consistency, and any divergence from, the Infrastructure Master Plan, and how the impacts of any divergence will be addressed, including a financial assessment (whole of life) of the options where alternative servicing strategies to those in the Infrastructure Master Plan have been considered.	Section 0; Section 5
W3.4 (l)	A statement of consistency with, and any divergence from, the Final precinct network plan for that Precinct, and how the impacts of any divergence will be addressed.	Section 0; Section 5
W3.4 (m)	A statement about whether each Works Contribution should be classified as either High Risk Infrastructure or Low Risk Infrastructure under clause W3.13, and information to support that statement.	Section 6

1.2 Site Location Details

Aura Precinct 13 is located immediately east of the Bruce Highway and north west from the Aura town centre (Approval DEV2013/469). The site is accessed from Central Avenue to the south. The approximate location of Aura Precinct 13 and proposed extents which forms the overall Aura Development lands are illustrated in Figure 1-1. For clarity and consistency, Aura Precinct 13 will be herein referred to as “the proposed development” or “Precinct 13”.

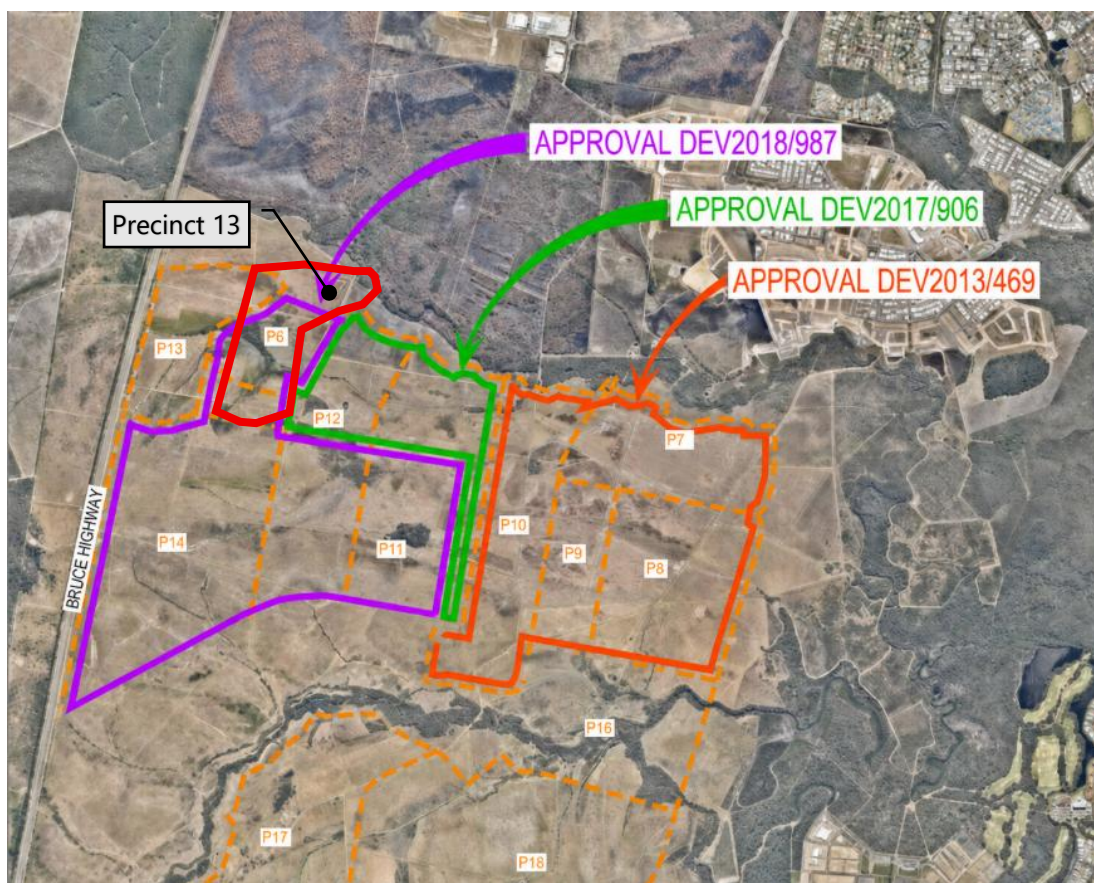


FIGURE 1-1: PRECINCT 13 LOCALITY PLAN

1.3 Development Application, Layout & Staging

The Aura development is located within the Caloundra South Priority Development Area and is therefore subject to approval from Economic Development Queensland (EDQ).

The proposed development layout is outlined in the RPS draft layout concept (Drawing No. 17546-03 Rev N) within Appendix A. Precinct 13 will consist primarily of low impact industrial and commercial land use. It is anticipated that development staging will generally extend from south to north, with access to Precinct 13 via a new north south road connected to Central Avenue.

In addition to Precinct 13 demands, allowance has been made within the network model to provide water and sewer services to future Lot 857 within Precinct 14, immediately south of Precinct 13.

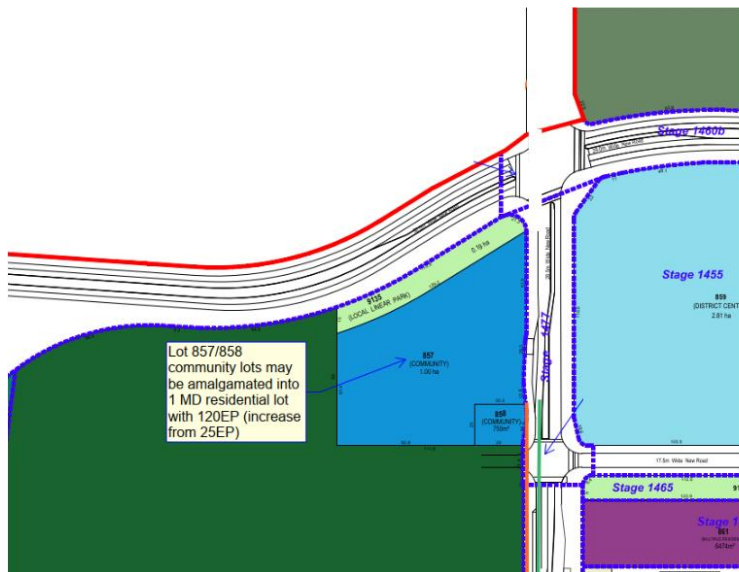


FIGURE 1-2: PRECINCT 14 – LOT 857 ALLOWANCE

Stockland has indicated a potential change in use on this lot from Community to mixed use (residential and indoor recreation) with a potential demand of 120 EP, increasing from the 25 EP allowed for in the Precinct 14 FPNP. Due to the potential uplift in yield on this lot, servicing through Precinct 13 is proposed to accommodate the additional demand. If the use does not change, the additional service to the site from Precinct 13 will not be required and servicing from Precinct 14 will be retained as originally planned.

1.4 Previous Investigations

The following investigations have previously been undertaken in support of the proposed Aura development. Reference may be made to the investigations within the following report.

- Egis (June 2022), Infrastructure Master Plan – Aura & Aura South Water & Wastewater, report No. 21-000307.06-WER01– Rev C;
- WSP | Parsons Brinckerhoff (April 2017), High Level Assessment of Additional Wastewater Servicing Options for Precincts 7 to 15 at Aura, Memo No. 2260586A-MEM-001-REV 01;
- WSP | Parsons Brinckerhoff (August, 2016), Caloundra South Water Supply & Sewerage Infrastructure Master Plan
- Unitywater, Caloundra South Interim Water Supply Assessment, Figure 2: Caloundra South Interim Connection; and
- Unitywater, Caloundra South Master Water Supply Strategy, Figure W4: Water Supply Infrastructure up to 15,000 EP.

1.4.1 Egis (June 2022), Infrastructure Master Plan – Aura & Aura South

On June 14th 2022, Egis submitted a revised IMP for Aura and Aura South, which has subsequently been approved by Unitywater and forms the basis of overarching infrastructure planning for the site. The key objectives of the revised IMP are:

- Consolidate water and wastewater servicing strategies for Aura & Aura South;
- Prepare updated demand estimates and growth projections for Aura & Aura South as a whole;
- Update infrastructure master planning to reflect the latest servicing strategies for previous precincts;
- Investigate opportunities to optimise planned infrastructure and share available capacity across both sites;
- Investigate opportunities to leverage existing network capacity and delay trunk infrastructure; and
- Document findings within a revised Infrastructure Master Plan to provide overarching servicing strategies to inform future Precinct Network Planning.

Following the submission of the revised IMP, the Precinct 13 plan of development was amended, resulting in a variance in EP from the estimates submitted within the revised IMP. The following table summarises the expected variance in EP.

TABLE 1-2: PRECINCT 13 FPNP POPULATION VARIANCE FROM IMP

PRECINCT 13 POPULATION ESTIMATE					
PLANNING HORIZON	UP TO 22,000 EP	22,001 30,000 EP	TO 30,001 45,000 EP	TO 45,001 60,000 EP	TO ULTIMATE DEVELOPMENT
Aura & Aura South IMP	0 EP	0 EP	0 EP	1,960 EP	2,100 EP
Precinct 13 FPNP	0 EP	250 EP	1,431 EP	1,431 EP	1,431 EP
Variance	0 EP	250 EP	1,431 EP	- 529 EP	- 669 EP

The latest proposed layout and yield for Precinct 13 adopted within this FPNP results in an ultimate population that is 669 EP less than previously estimated in the revised IMP.

2 ASSUMPTIONS

This section provides detail of the key assumptions made in developing the water and wastewater service strategies to support the proposed development.

2.1 Network Models

To assess the water and wastewater infrastructure, the latest network models were requested from Unitywater. The following InfoWorks models were provided by Unitywater on the 27th March 2026:

- 20260305 Image Flat and Landers Shute Model Draft 5. 7ZIP (WS PRO)
- 20240207 - Kawana Master Plan ICM Model 7 zip (ICM)

It should be noted that these models are different to those used in previous network modelling and master planning completed for Aura. Unlike the previous masterplan models, the latest versions are operated in Autodesk InfoWorks software and instead of EP planning horizons, they use planning year (i.e. 2026, 2031) horizons.

Given the surrounding development is substantially progressed and the population estimated for Precinct 13 is less than previous master planning assumptions, the focus of this FPNP will remain the internal water and sewer infrastructure only. The changed network model parameters are therefore less of a concern and updated models provided remain suitable for Precinct 13 network analysis.

Precinct 13 is planned to commence within the 22,001 EP to 30,000 EP planning horizon. To align with the new network model planning year range, assessment has been undertaken for the 2031, 2036, 2041, 2046 and 2051 horizons. The ultimate EP for Precinct 13 has been applied to each of these horizons, with network performance assessed for each scenario to confirm desired standards of service can be met.

2.2 Greater Aura Development Precincts

For the purpose of this investigation, the surrounding trunk infrastructure staging proposed within the revised IMP has been adopted as the preferred strategy. The Level of Service (LoS) within precincts external to the site has not been assessed in detail as part of this FPNP.

Assessment of water network infrastructure external to Precinct 13 was not performed as part of this investigation as external network capacity investigations have previously been undertaken. With Precinct 13 population estimates lower than previous IMP estimates, there is residual capacity within the external trunk network. The FPNP assumes that external infrastructure capacity and triggers remain consistent with the previous Aura planning.

It has also been assumed that the trunk network required for the previous Aura development applications will have been constructed prior to commencing works within the proposed development.

2.3 Desired Standards of Service

The following is a summary of the Desired Standards of Service (DSS) adopted for the proposed development. The water supply and wastewater design criteria have been adopted in accordance with the design criteria outlined within the Parsons Brinckerhoff IMP, which is generally based on the South-East Queensland Water Supply and Sewerage Design & Construction Code (SEQ Code).

2.3.1 Water Supply

The water supply DSS criteria has been adopted in accordance with Section 2.1 of the approved IMP.

- Average Day Demand (AD) per EP = 230 L/EP/d
- Estimated Non-Revenue Water (NRW) = 30 L/EP/d
- Mean Day Maximum Month (MDMM) = 1.5 x AD
- Peak Day (PD) = 2 x AD
- Peak Hour (PH) = 2.8 x AD
- Minimum service pressure for Peak Hour demands = 22 m at property boundary
- Minimum residual mains pressure for Fire Flow demands = 12 m in the main at the flowing hydrant
- Detached residential (<=3 storeys) firefighting capacity = 15 L/s for 2 hours
- Multi story residential (>3 storeys) firefighting capacity = 30 L/s for 4 hours
- Commercial / industrial firefighting capacity = 30 L/s for 4 hours

2.3.2 Wastewater (Infrastructure Master Plan Criteria)

The wastewater DSS criteria has been adopted in accordance with Section 2.2 of the approved IMP.

- Average Dry Weather Flow (ADWF) = 210 L/EP/d
- Peak Dry Weather Flow (PDWF) = $C2 \times ADWF$ where $C2 = 4.7 \times (EP)^{-0.105}$
- PWWF (PWWF) = 4 x ADWF
- Pump Operation Mode = duty/assist
- Manning's value (n) = 0.0128
- Maximum depth of flow = 75% depth at PWWF
- Minimum velocity = 0.7 m/s at PDWF
- Pump station minimum emergency storage: 6 hours at ADWF

2.4 Kawana Treatment Plant

It has been assumed that the Kawana Wastewater Treatment Plant (WWTP) has sufficient capacity to service the proposed development.

3 DEVELOPMENT PROJECTIONS

Development demands for this FPNP have been adopted in accordance with the RPS layout concept (Drawing No. 17546-03 Rev N) within Appendix A. Table 3-1 provide an overview of the EP projections per land use type. Population estimates for Precinct 13 have adopted the projected upper limit yield, with 10% contingency applied to account for any future change to yield distribution throughout Precinct 13.

TABLE 3-1: PRECINCT 13 DEVELOPMENT DEMANDS PER PLANNING HORIZON

PRECINCT 13 POPULATION ESTIMATE PER LANDUSE					
LAND USE	LOT AREA	GFA	EP / UNIT	EP	EP + 10%
Service Station	11,460 m ²	300 m ²	1.5 EP / 100 m ² GFA	4.5	4.95
Fast Food		1,500 m ²	4.7 EP / 100 m ² GFA	70.5	77.55
Car Wash	6 Bays	210 m ²	20.3 EP / 100 m ² GFA	42.63	46.89
Hardware / Showroom	40,050 m ²	20,000 m ²	0.2 EP / 100 m ² GFA	40	44
Light Industry / Commercial	177,125 m ²	136,439 m ²	0.75 EP / 100 m ² GFA	1,023.3	1,125.6
Precinct 14 – Lot 857	Mixed Use			120	132
Total	228,336 m²	159,439 m²	-	1,300.93	1,430.99

Note: 1) GFA calculated at 77% of total lot area for Light Industry and Commercial lots

2) 0.75 EP / 100 m² GFA applied for Light Industry and Commercial lots, consistent with previous assumptions used for similar stages development within Aura.

3) Car Wash assumed 35 m² per car wash bay.

EP rates by land use have been applied in accordance with the Caloundra South Infrastructure Agreement for Service Station and Fast Food lots. For the Showroom and Light Industry/Commercial land uses, higher EP rates than those prescribed in the Infrastructure Agreement have been adopted to provide a conservative network assessment, recognising the variability and uncertainty in potential development outcomes within these land use categories.

As noted earlier in Section 1.3, allowance for Lot 857 within Precinct 14 has been included to ensure adequate capacity is available should the land use change and demand increase from 25 EP to 120 EP.

As outlined in Table 3-1, a maximum development demand of 1,430.99 EP (rounded to 1,431 EP) is projected for the proposed development. The demands projected for this FPNP are 669 EP less than those reported in the Revised IMP for Precinct 13.

3.1 Aura External Precinct Demand Assessment

To accurately assess the performance of the internal water & wastewater networks for the proposed development, external precinct development demands have been assumed for each planning horizon. The external precinct demand assumptions have been adopted in accordance with the latest FPNP reports, Revised IMP and advice received from Stockland. It has been assumed that the revised models provided by Unitywater consider the population growth in line with the revised IMP as presented in Table 3-2.

TABLE 3-2: AURA DEVELOPMENT POPULATION PROJECTIONS ACROSS PRECINCTS

AURA DEVELOPMENT POPULATION PROJECTIONS

DEVELOPMENT PRECINCT	UP TO 22,000 EP	22,001 30,000 EP	TO 30,001 45,000 EP	TO 45,001 60,000 EP	ULTIMATE DEVELOPMENT
Precinct 1	905	905	905	905	905
Precinct 2	4,950	4,950	4,950	4,950	4,950
Precincts 3 & 4	500	1,000	993	3,000	3,158
Precinct 5	130	855	869	869	869
Precinct 6	0	0.00	0	0	0
Precinct 7	500	539	1,617	2,425	2,695
Precinct 8	491	1,626	3,794	5,420	5,963
Precinct 9	450	501	1,169	1,670	1,837
Precinct 10	2,659	2,659	2,659	2,659	2,659
Precinct 11	3,473	3,473	3,473	3,473	3,473
Precinct 12	3,430	3,430	3,430	3,430	3,430
Precinct 13	0	250	1,431	1,431	1,431
Precinct 14	1,629	2,332	3,745	4,804	5,158
Precinct 15	1,415	2,358	4,245	4,514	4,514
Precinct 16	0	0	0	0	103
Precinct 17	0	2,042	4,084	5,105	5,600
Precinct 18	1,468	1,760	4,106	5,866	6,000
Precinct 19	0	1,320	2,964	4,446	5,500
Aura South	0	0.00	566	5,033	25,284
Aura Total	22,000 EP	30,000 EP	45,000 EP	60,000 EP	83,529 EP
Aura & Aura South Total	22,000 EP	30,000 EP	45,000 EP	60,000 EP	85,284 ¹ EP
Divergence IMP	0 EP	0 EP	0 EP	0 EP	-1,755 EP

Note: 1) Aura South population estimate shown for water supply. Wastewater estimate is higher (88,137 EP) due to the broad hectare EP rates adopted for non-residential demands.

As detailed in Table 3-2, the ultimate Aura & Aura South demands remain within EP limits outlined for each phase within the Revised IMP. Interrogation of model population loading external to Precinct 13 was not carried out under this assessment.

4 WATER SUPPLY

A water network assessment was undertaken to assess the infrastructure required to service Precinct 13 of the proposed Aura development. Trunk network infrastructure and greater Aura service strategies have been adopted in accordance with previous Egis (Calibre) reports and the Revised IMP. All proposed water service strategies are conceptual only and remain subject to detailed engineering design.

The revised IMP water supply strategy assumed that the regional servicing strategy and planned external trunk infrastructure remains unchanged and will be in place to service demands once existing network capacity is exhausted. Figure 4-1 illustrates the Unitywater planned external infrastructure, no further investigation was undertaken as part of the revised IMP.

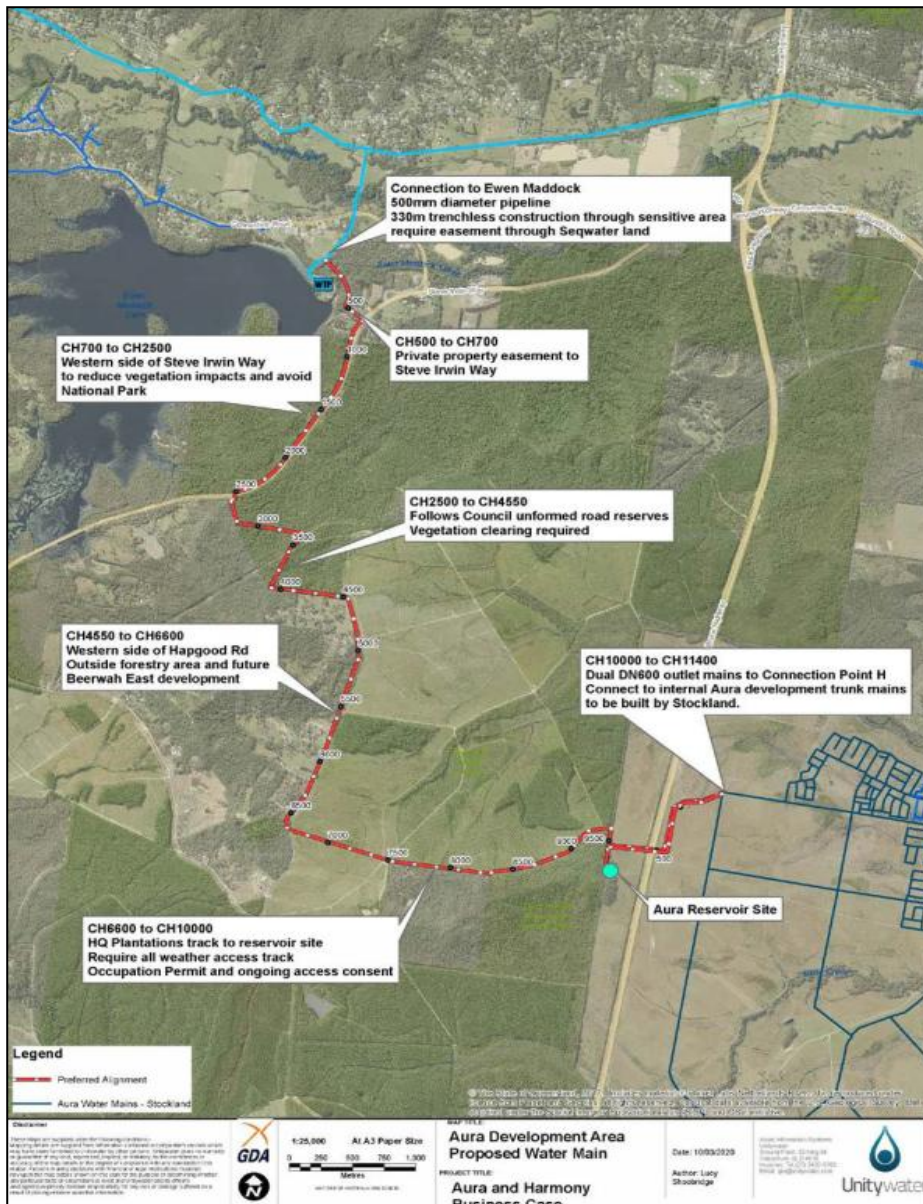


FIGURE 4-1: REGIONAL TRUNK WATER INFRASTRUCTURE (SOURCE: UNITYWATER, 2021)

4.1 Methodology

Assessment was undertaken to confirm that the proposed development can be sufficiently serviced in accordance with the SEQ Code and nominated DSS. Water network modelling was undertaken with InfoWorks WS Pro, consistent with the latest modelling software used by Unitywater. The following provides a description of the methodology adopted in assessing the water supply network capacity:

- Develop an internal reticulation network for the proposed site across relevant planning horizons;
- Calculate the projected population for Precinct 13 under the relevant planning horizons and apply to the updated network model; and
- Assess the impact of planned demands and level of service within the proposed development site for Peak Hour and Fire Flow conditions.

As previously noted in Section 2.1, the model provided by Unitywater is different to the models used in previous network planning. The latest model was provided by Unitywater in InfoWorks WS Pro format, with planning year horizons used instead of the population horizons adopted in past models. On this basis and to support a conservative assessment, the ultimate population for Precinct 13 was assessed across the 2031, 2036, 2041, 2046 and 2051 planning horizons.

4.2 Water Supply Demand Projections

Water supply demand projections for the proposed development have been estimated in accordance with the water supply design criteria outlined within Section 2.3. The water demand projections are presented in Table 4-1.

TABLE 4-1: AURA PRECINCT 13 WATER DEMAND PROJECTIONS

WATER DEMAND PROJECTIONS	
DEMAND TYPE	2031 - 2051
Population	1,431 EP
Average Day (L/s)	4.31 L/s
MDMM (L/s)	6.21 L/s
Peak Day (L/s)	8.12 L/s
Peak Hour (L/s)	11.16 L/s
Fire Flow (L/s)	30 L/s

A maximum Peak Hour demand of approximately 11.16 L/s is projected for the proposed development. A fire flow demand of 30 L/s for four hours is triggered by the educational and commercial land uses.

4.3 District Metering Area

It is assumed that Precinct 13 is encompassed within a single district metering area, with one primary supply connection. The proposed primary point of supply along the critical loop main is conceptual and should be verified through detailed design of the water supply network.

Given the location and layout of Precinct 13, there is no secondary point of supply with only a single connection proposed for the DMA. If Unitywater prefer a secondary connection for security of supply, the single DN200 connection can be changed to dual DN150 connections supplying the dual reticulation network within Precinct 13.

4.4 Proposed Infrastructure Staging

With Precinct 13 proposed to commence under Phase 2 (22,001 to 30,000 EP), most of the external trunk infrastructure will be constructed and operational as per IMP servicing strategies. It is assumed any trunk infrastructure planned for Phase 1 will be operating prior to development commencing within Precinct 13. The proposed servicing strategy for Precinct 13 is presented over the following planning phases:

- Phase 2 – 22,001 EP to 30,000 EP
- Phase 3 & 4 – 30,001 EP to 60,000 EP
- Phase 5 - Ultimate 85,284 EP

The following sections outline the servicing constraints and opportunities under each of the proposed phases.

4.4.1 Phase 2 (22,001 – 30,000 EP)

As development demands approach 22,000 EP, it is anticipated that the proposed Aura reservoir (refer Figure 4-2) will be commissioned and operational. Once demands exceed 22,000 EP, the existing point of supply from Bellvista Boulevard and Racecourse Road will be disconnected and Aura serviced entirely from the new 12 ML reservoir.

In accordance with previous planning, it is anticipated that the single 12 ML reservoir will have sufficient capacity to service up to 30,000 EP within Aura. No development is planned to occur within Aura South under this development horizon, with all demands attributed to Aura.

It is anticipated that the dual DN600 outlet mains from the 12 ML reservoir are delivered by Unitywater, with Aura connecting to these at the western boundary of the site (Precinct 14). The internal trunk network extends east and south from this connection point and distributes water throughout the site.

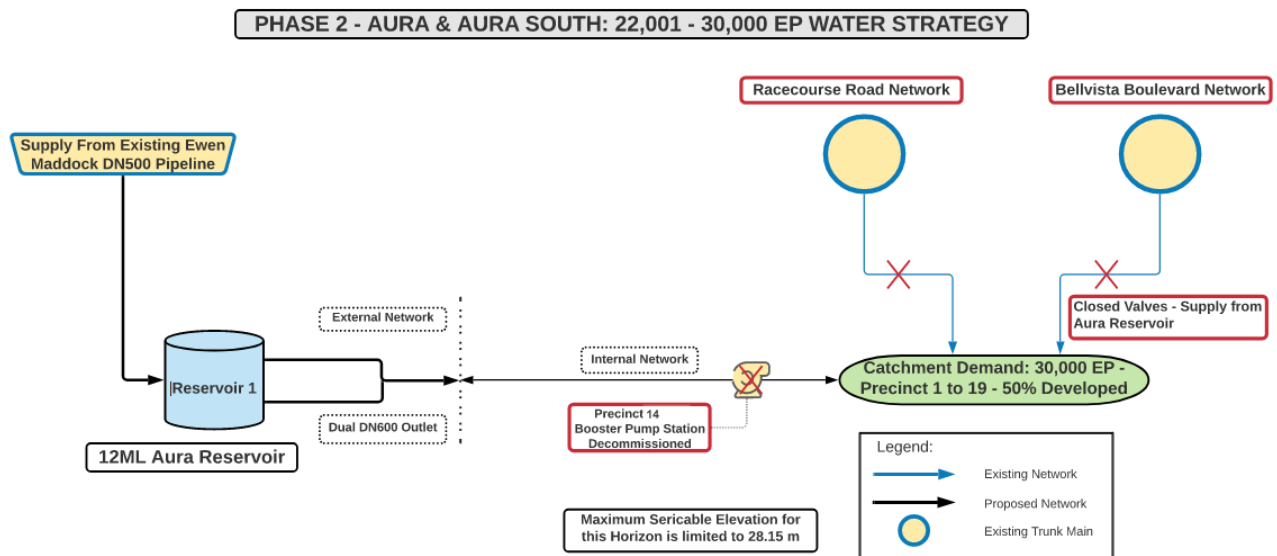


FIGURE 4-2: PHASE 2 WATER STRATEGY SCHEMATIC

It is expected that development of Precinct 13 will commence under Phase 2, with an estimated demand of 250 EP reached prior to Phase 3. To support development, a DN200 water main will extend north from the DN800 trunk water main running along Central Avenue. This DN200 will connect into a dual DN150 water network throughout the precinct, with water mains provided along each verge to support commercial and industrial development. The proposed water network layout is illustrated in Figure 4-3.

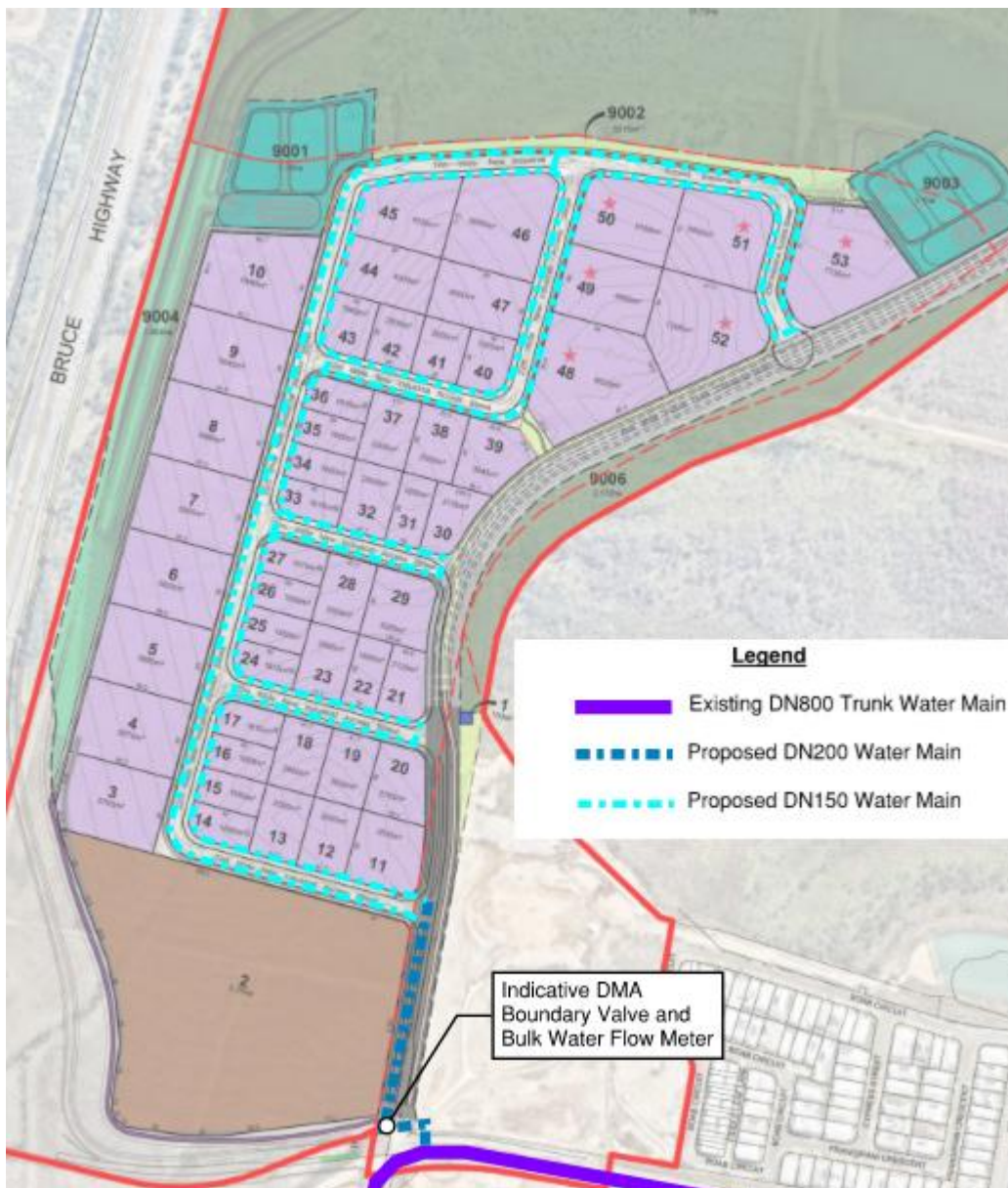


FIGURE 4-3: PRECINCT 13 PROPOSED WATER NETWORK CONFIGURATION

A sensitivity analysis was carried out using a DN100 dual reticulation network, however it was found that fire flow requirements were unable to be met with this configuration.

The location of the proposed District Meter Area boundary valve and bulk water flow meter is indicative only and will need to be suitably located as part of detailed design for the Precinct 13 network. Should the land use change occur to Lot 857 in Precinct 14, a DN100 water main will extend south across Central Avenue. This DN100 water main is proposed to connect downstream of the proposed bulk water flow meter, forming part of the Precinct 13 DMA.

4.4.2 Phase 3 & 4 (30,001 – 60,000 EP)

The duplication of the Aura reservoir is triggered under Phase 3 when populations exceed 30,000 EP. The dual 12 ML reservoirs can service a total population of up to 60,000 EP across both Aura and Aura South. The trunk water network is completely developed throughout Aura, with an extension into Aura South to service the initial development stages. The maximum serviceable elevation under the dual reservoir regime is 22.70m AHD, with Precinct 13 having a maximum elevation of 18.5m AHD. Figure 4-4 illustrates the proposed servicing strategy described.

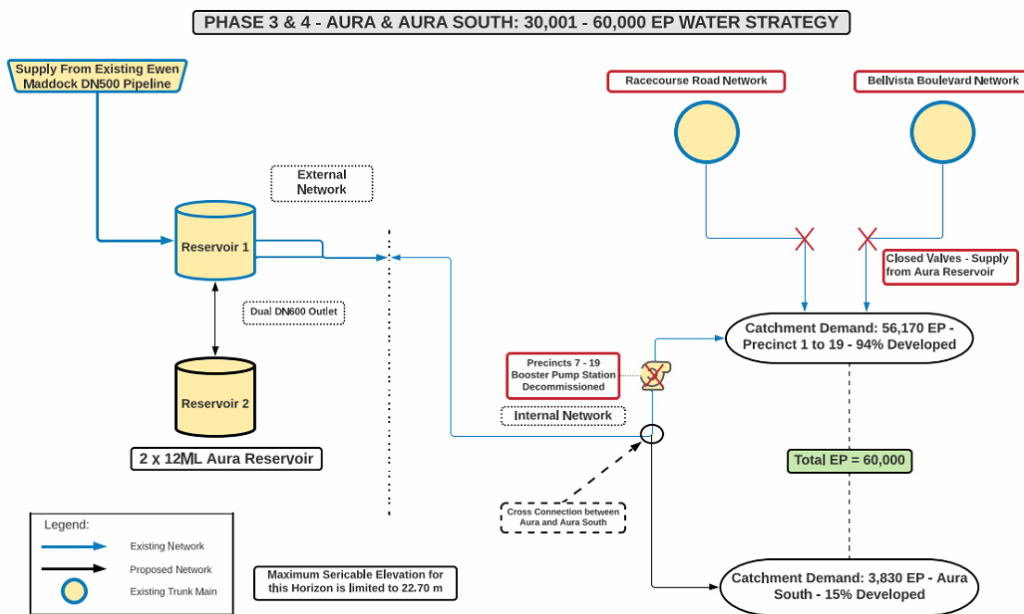


FIGURE 4-4: PHASE 3 & 4 WATER STRATEGY SCHEMATIC

With Precinct 13 fully developed and ultimate populations realised under Phase 3, there is no change to water demand or network configuration under Phase 3 & 4.

4.4.3 Phase 5 (Ultimate 85,284 EP)

Phase 5 represents the ultimate water servicing strategy for Aura & Aura South, with 85,284 EP serviced across both sites. To remove elevation constraints and provide the required capacity, a new standalone 11.5 ML reservoir is proposed for Aura South.

Once constructed, boundary valves are closed between Aura and Aura South with both networks serviced independently of each other. Figure 4-5 below illustrates the servicing strategy described.

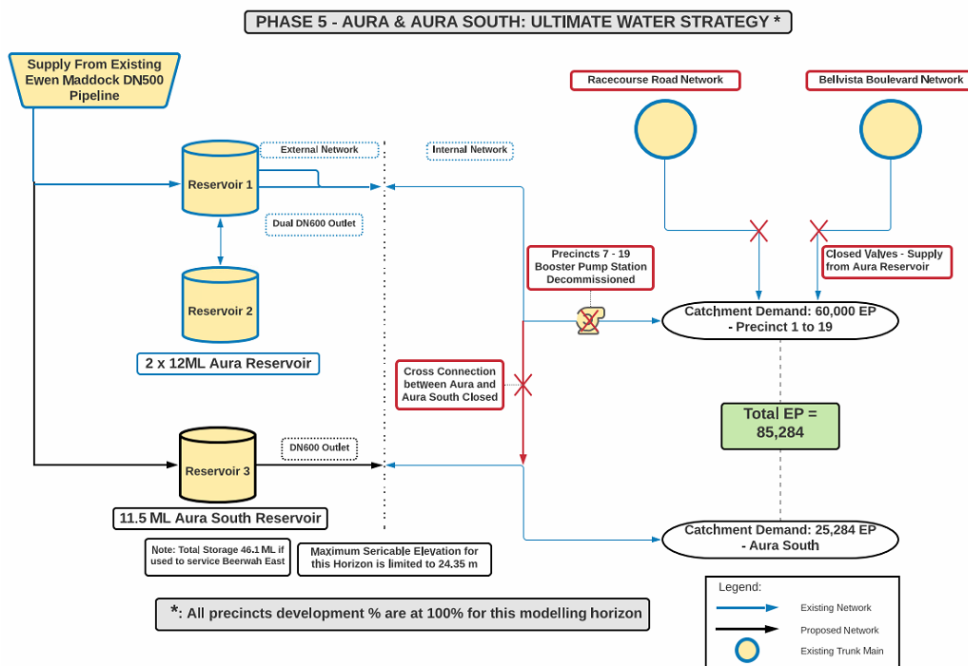


FIGURE 4-5: PHASE 5 WATER STRATEGY SCHEMATIC

With Precinct 13 fully developed and ultimate populations realised under Phase 3, there is no change to water demand or network configuration under Phase 5.

4.5 Water Infrastructure Staging Summary

Table 4-2 provides a summary of the key infrastructure components required to service each phase of Aura and Aura South developments.

TABLE 4-2: PRECINCT 13 WATER SERVICE STRATEGY SUMMARY

PRECINCT 13 WATER SERVICE STRATEGY SUMMARY		
PHASE	P13 DEMAND	KEY INFRASTRUCTURE TRIGGERED
2	250 EP	- Construction of DN200 water main with connection to the existing DN800 trunk main along Central Avenue. - Construction of a DN150 dual water network throughout the precinct as shown in Figure 4-3. - DN100 extension to Lot 857 within Precinct 14 if land use is changed and population increases from 25 EP to 132 EP.
3		No further infrastructure required for Precinct 13.
4	1,431 EP	No further infrastructure required for Precinct 13.
5		No further infrastructure required for Precinct 13.

4.6 Water Supply Network Assessment

Network modelling of the proposed water supply strategies was undertaken to assess the level of service in accordance with DSS described in Section 2.3. Detailed network analysis was limited to the Precinct 13 internal network under the assumption that external network analysis was sufficiently satisfied through previous master planning and external precinct investigations.

Analysis of the proposed service strategies was undertaken for Peak Hour (PH) and Fire Flow (FF) conditions across five planning horizons. While it is anticipated that only 250 EP will be present during Phase 2, ultimate demands were modelled to confirm capacity and provide flexibility in population growth should development occur at a rate faster than anticipated. For this assessment, conceptual bulk earthworks levels have been adopted for finished surface levels, with a maximum surface level of 18.5m AHD. Table 4-3 identifies the network pressures recorded for Precinct 13 under the four phases of development.

TABLE 4-3: WATER MODELLING RESULTS

PRECINCT 13 WATER NETWORK MINIMUM PRESSURES				
HORIZON	POPULATION	MINIMUM PRESSURE	MAXIMUM PRESSURE	FIRE FLOW 30 L/S
2031		37.84 m	47.37 m	30.67 m
2036		43.87 m	49.64 m	30.59 m
2041	1,431 EP	42.38 m	49.67 m	30.52 m
2046		41.17 m	49.56 m	30.44 m
2051		39.44 m	49.47 m	30.36 m

Water network analysis indicates that under PH conditions the proposed service strategies satisfy the DSS. The minimum pressure recorded during peak hour demand is 37.84 m, above the SEQ Code minimum requirement of 22 m. The minimum residual pressure recorded under fire flow conditions is 30.36 m, above the SEQ Code minimum requirement of 12 m. Water supply network analysis indicated that under PH and FF conditions, the proposed water infrastructure has capacity to service the proposed development across the planning horizons assessed.

5 WASTEWATER

A wastewater network analysis was undertaken to assess the infrastructure required to service Precinct 13 of the proposed Aura development. Trunk network infrastructure and greater Aura service strategies have been adopted in accordance with previous Egis (Calibre) reports and the Revised IMP. All proposed wastewater service strategies are conceptual only and remain subject to detailed engineering design.

Figure 5-1 illustrates the Unitywater planned external trunk infrastructure. No further assessment of regional serving strategy was undertaken as part of this investigation.

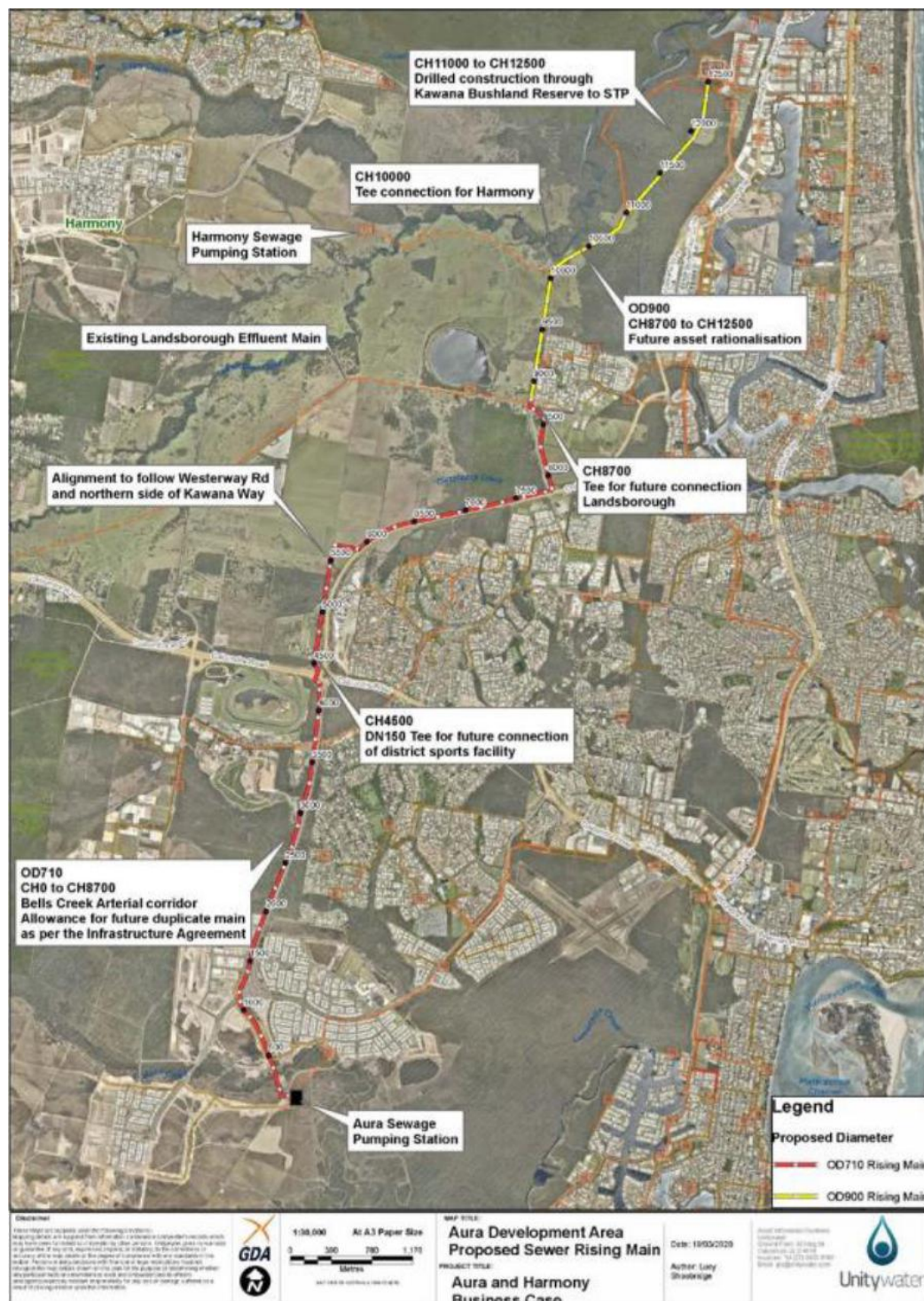


FIGURE 5-1: REGIONAL TRUNK WASTEWATER INFRASTRUCTURE (SOURCE: UNITYWATER, 2021)

5.1 Methodology

Assessment was undertaken to confirm that the proposed development can be serviced in accordance with the DSS outlined in Section 2.3. Wastewater network modelling was undertaken with the use of InfoWorks ICM software, consistent with latest Unitywater network models. The following provides a description of the methodology adopted in assessing the wastewater network capacity:

- Develop an internal reticulation network for the proposed site;
- Calculate the projected wastewater demands for Precinct 13 under the relevant planning horizons and apply to the updated network model; and
- Assess the impact of planned demands and level of service within the proposed development site for Peak Wet Weather Flow conditions.

5.2 Wastewater Load Projections

Wastewater load projections for the proposed development have been estimated in accordance with the wastewater design criteria outlined within Section 2.3 and are presented in Table 5-1.

TABLE 5-1: AURA PRECINCT 13 WASTEWATER LOAD PROJECTIONS

WASTEWATER DEMAND PROJECTIONS	
DEMAND TYPE	2031 - 2051
Population	1,431 EP
Average Dry Weather Flow (L/s)	3.47 L/s
Peak Dry Weather Flow (L/s)	7.62 L/s
Peak Wet Weather Flow (L/s)	13.91 L/s

A maximum PWWF of approximately 13.91 L/s is projected to be generated by Precinct 13.

5.3 Proposed Infrastructure Staging

In accordance with previous investigations and service strategies, wastewater servicing of the Aura development is split into two key stages dictated by the 15,000 EP threshold. Unitywater advice has indicated that the interim wastewater service strategy can service up to 15,000 EP from the Aura development before exceeding the available capacity within the existing LMT002 pump station and combined rising main.

Based on previous demand projections, Aura was anticipated to reach the 15,000 EP trigger prior to SPS001 and its associated rising main becoming operational. At the time of reporting, SPS001 and the associated rising main are now operational and available to service existing and future wastewater demands.

With Precinct 13 proposed to commence under Phase 2 (22,001 to 30,000 EP), most downstream trunk infrastructure will be constructed and operational as per IMP servicing strategies. It is assumed any trunk infrastructure planned for Phase 1 will be operating prior to development commencing within Precinct 13. The proposed servicing strategy for Precinct 13 is presented over the following planning phases:

- Phase 2 – 22,001 EP to 30,000 EP
- Phase 3 – 30,001 EP to 45,000 EP
- Phase 4 – 45,001 EP to 60,000 EP
- Phase 5 - Ultimate 88,137 EP

The following sections outline the servicing constraints and opportunities under each of the proposed phases.

5.3.1 Phase 2 (22,001 – 30,000 EP)

Once demands exceed the 22,000 EP threshold (2026 horizon), flows will be diverted into SPS001 with SPS-A mothballed for the duration of this phase. All flows from Precincts 2 to 19 will be discharged into SPS001 via the internal trunk sewer network, with wastewater pumped directly to the Kawana STP via an OD710 / OD900 trunk rising main as illustrated in Figure 5-1. Only the flow from Precinct 1 will reach the Kawana STP using SPS-LMT114 and the existing external network.

Under this phase, no development has occurred within Aura South with all loading attributed to Aura Precincts 1 to 19. The internal servicing strategy is generally consistent with Phase 1, the primary difference being the introduction of a new SPS (SPS004) and rising main (OD400) to service Precinct 17 to 19. SPS004 is proposed to be located within Precinct 18, adjacent to the future Bells Creek Arterial. Figure 5-2 illustrates the Phase 2 servicing strategy.

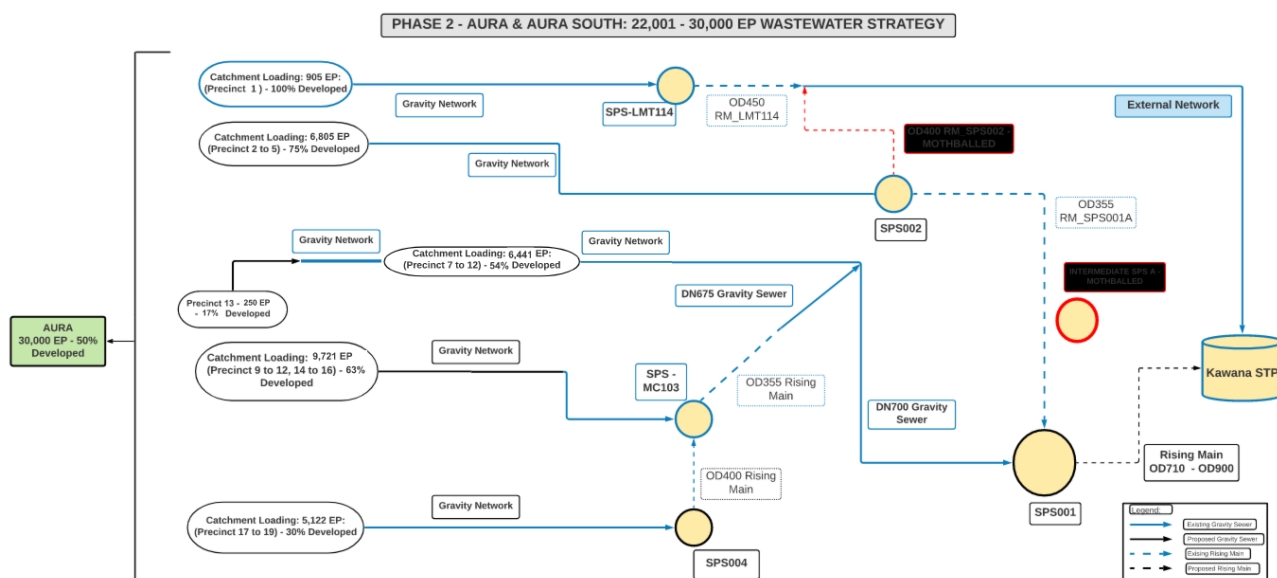


FIGURE 5-2: PHASE 2 WASTEWATER STRATEGY SCHEMATIC

As illustrated in Figure 5-2, Precinct 13 will be serviced via gravity connection to the existing network within Precinct 12. Previous network planning indicated the need for a lift station, however, finalised lot layouts and detailed bulk earthwork planning indicate connection can be achieved through direct gravity connection.

Precinct 13 will therefore be serviced through a DN160 (PE100) gravity network, with a DN250 (PE100) gravity sewer connecting into the existing DN355 stub provided at MH5365191. If the proposed land use change occurs for Lot 857 in Precinct 14, a DN160 (PE100) gravity sewer will extend further south across Central Avenue to service the 132 EP attributed to the mixed use lot.

Precinct 13 is top of the gravity catchment, with no upstream development or loads from other precincts to be conveyed through the proposed network shown in Figure 5-3.

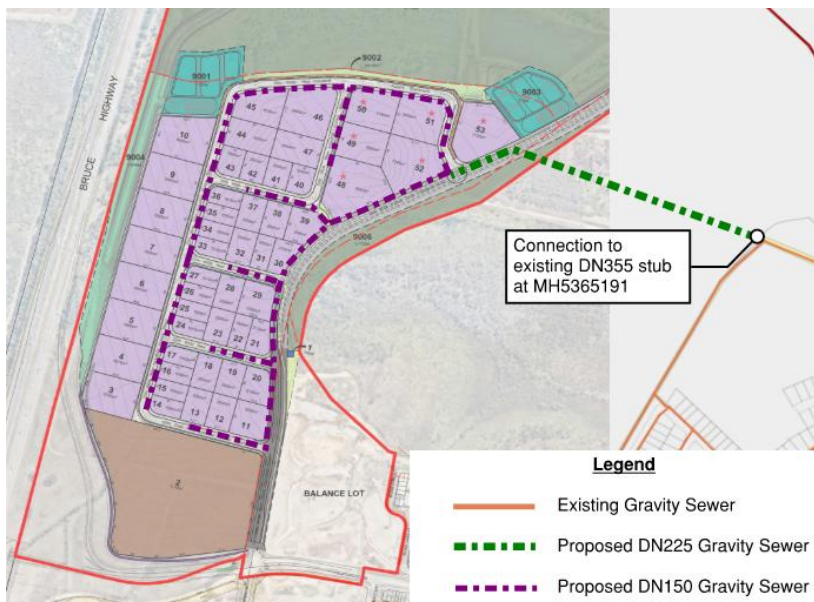


FIGURE 5-3: PRECINCT 13 PROPOSED NETWORK LAYOUT

5.3.2 Phase 3 (30,001 – 45,000 EP)

Under Phase 3, development commences within Aura South and triggers an additional trunk gravity sewer (DN710) which connects Aura South to SPS004. To divert flows away from the town centre, it is proposed that SPS MC103 will be converted into a lift station, conveying flows to SPS001 via a new DN1000 trunk gravity sewer.

To minimise the cost of pumping and capacity required at SPS-MC103, the SPS004 rising main is reconfigured with flows directed into the newly constructed DN1000 trunk gravity sewer downstream of SPS-MC103. In accordance with previous planning and servicing strategies, SPS001 will service 30,000 EP via the external OD710 / OD900 trunk rising main discharging directly to Kawana STP. The balance of demands (up to 15,000 EP) will be conveyed to Kawana STP via the external SPS LMT002 and upstream SPS-A, SPS002 and SPS LMT114 transfer network.

Figure 5-4 illustrates the servicing strategy, with no change to the Precinct 13 servicing strategy is proposed under Phase 3.

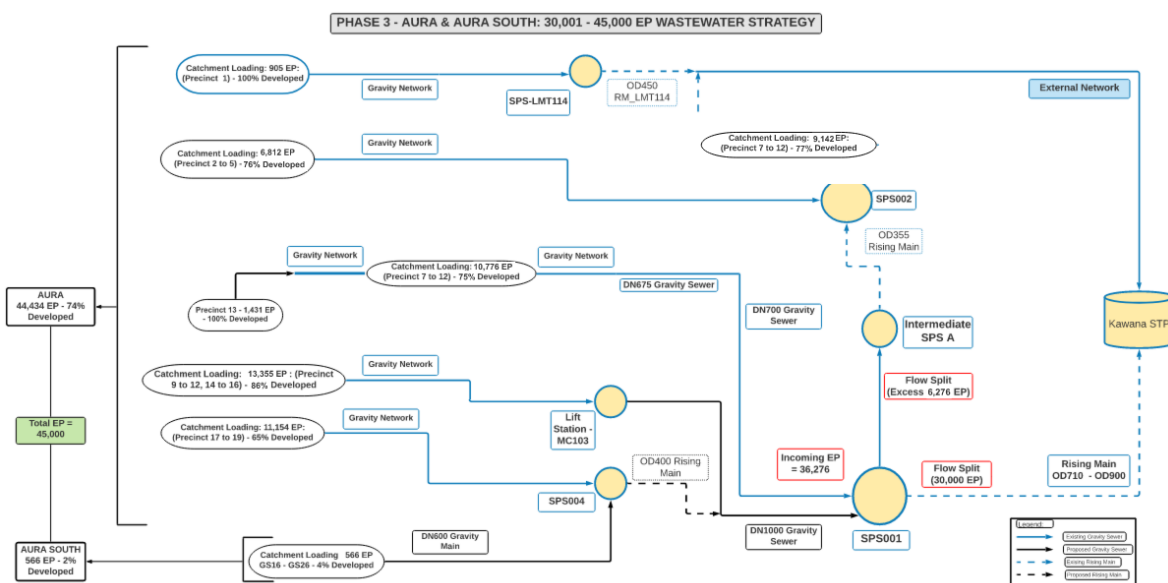


FIGURE 5-4: PHASE 3 WASTEWATER STRATEGY SCHEMATIC

5.3.3 Phase 4 (45,001 – 60,000 EP)

During Phase 4, the majority of Aura is developed with approximately 94% of ultimate demands applied. Under Phase 4, all flows from Aura Precincts 2 to 19 and Aura South are conveyed to SPS001 via the internal trunk network. To service up to 60,000 EP, the SPS001 rising main (OD710 / OD900) is duplicated with all flow pumped directly to Kawana STP. Depending on the regional servicing requirements, the rising main diameter may increase to cater for additional loads external to Aura and Aura South. Figure 5-5 illustrates the servicing strategy described, with no change to the Precinct 13 servicing strategy proposed under Phase 4.

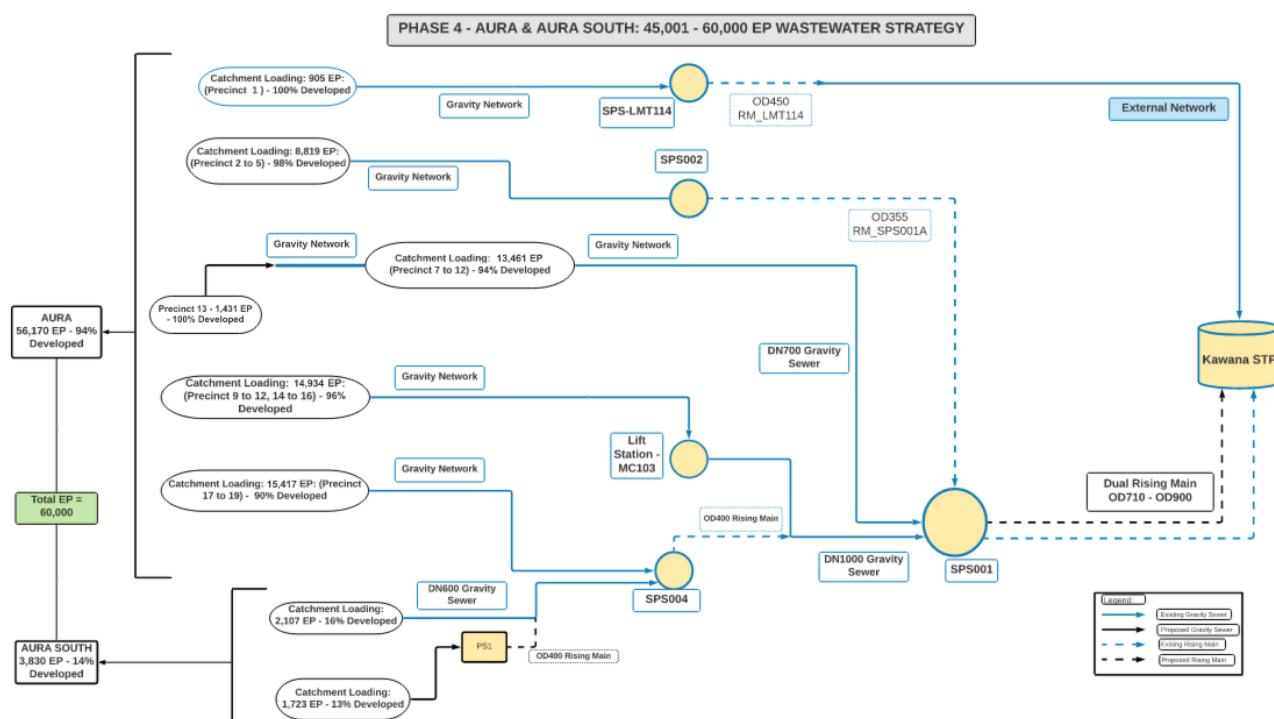


FIGURE 5-5: PHASE 4 WASTEWATER STRATEGY SCHEMATIC

5.3.4 Phase 5 (Ultimate 88,137 EP)

Phase 5 represents the ultimate network configuration, with 100% of Aura and Aura South demands serviced. Under this phase, the Aura network is mostly consistent with Phase 4, the only change being infrastructure upgrades to cater for the ultimate Aura South network. SPS001 continues operating with flows conveyed to Kawana STP via the dual rising mains triggered under Phase 4.

No change is proposed to Precinct 13 servicing under this phase, with the full development population realised under Phase 3 and ultimate infrastructure in place. Figure 5-6 illustrates the servicing strategy described.

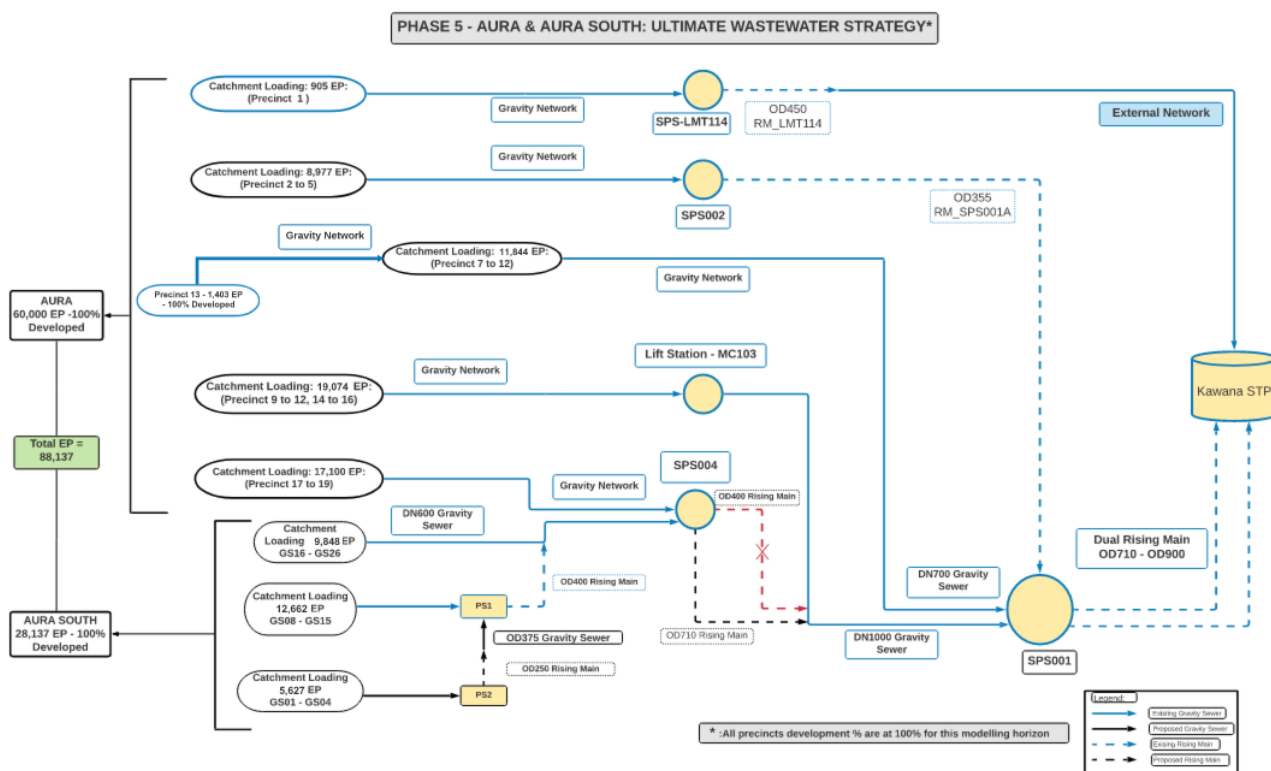


FIGURE 5-6: PHASE 5 WASTEWATER STRATEGY SCHEMATIC

5.4 Trunk Infrastructure Staging Summary

Table 5-2 provides a summary of the trunk infrastructure components required to service each phase of development.

TABLE 5-2: PRECINCT 13 WASTEWATER SERVICE STRATEGY SUMMARY

PRECINCT 13 WASTEWATER SERVICE STRATEGY SUMMARY		
PHASE	P13 DEMAND	KEY INFRASTRUCTURE TRIGGERED
2	250 EP	- Construction of DN250 gravity sewer connection to existing DN355 stub at MH5365191. - Construction of a DN160 gravity sewer network as shown in Figure 5-3. - DN160 gravity sewer extension to Lot 857 within Precinct 14 if land use is changed and population increases from 25 EP to 132 EP.
3		No further infrastructure required for Precinct 13.
4	1,431 EP	No further infrastructure required for Precinct 13.
5		No further infrastructure required for Precinct 13.

5.5 Wastewater Network Assessment

Network modelling of the proposed wastewater strategies was undertaken to assess the level of service in accordance with DSS described in Section 2.3. Detailed network analysis was limited to the Precinct 13 internal network under the assumption that external network analysis was sufficiently satisfied through previous master plan and external precinct investigations.

All onsite wastewater infrastructure has been sized in accordance with the design criteria outlined in Section 2.3 and remains subject to final detailed engineering design. For this assessment, conceptual bulk earthworks levels have been adopted for finished surface levels.

5.5.1 Gravity Sewer Design

The internal sewer network has been sized with capacity to convey PWWF without exceeding 75% of pipe capacity. Typically, a DN160 gravity sewer laid at minimum grade (1:180) can service approximately 10.5 L/s, with a DN250 providing up to 24 L/s capacity when laid at 1:300 minimum grade.

Given Precinct 13 is top of the catchment, sizing of gravity sewers only considers flows generated within the precinct. On this basis, DN160 gravity sewers have been adopted with a DN250 provided for downstream length of network where PWWF (13.91 L/s) exceed capacity of a DN160 gravity sewer. Minimum grades have been applied as per SEQ Code D&C requirement, enabling removal of the previously proposed lift station.

Assessment of external gravity sewer infrastructure was not undertaken, with the Precinct 13 population below previous assumptions assessed as part of the IMP.

TABLE 5-3: PRECINCT 13 GRAVITY SEWER PERFORMANCE

GRAVITY SEWER PERFORMANCE						
DIAMETER	MIN GRADE	EP	PDWF	PWWF	PDWF VELOCITY	PWWF DEPTH
DN160	1:180	900 EP	4.79 L/s	8.75 L/s	0.68 m/s	63%
DN250	1:300	1,431 EP	7.62 L/s	13.91 L/s	0.62 m/s	52%

Note: Depth of flow presented as a percentage of depth flow vs internal pipe diameter (capacity d/D).

As shown in Table 5-3, desired standards of service are met for the gravity sewer network during PDWF and PWWF conditions. With no change to population in Precinct 13 or upstream contributing catchments over each of the planning horizons, the above results apply to all scenarios.

6 LAND & WORKS CONTRIBUTION

The Caloundra South Infrastructure Agreement (IA) sets out requirements for land and works contributions to be made by Stockland and Unitywater throughout the project. These are included in Part C, Part D, Schedule 3 and Schedule 4 of the Infrastructure Agreement.

Parts C and D of the IA describe the requirements and process for provision of the land and works contributions generally. All works proposed will be delivered in accordance with these requirements. Schedules 3 and 4 of the IA tabulate the specific land and works contributions required to be made, i.e. external ultimate and interim works and internal precinct level works.

Schedule 3 includes major infrastructure items external to the development, which are required to service the development, in both interim and ultimate scenarios, along with trigger/timing requirements of these items. The items specified within Schedule 3 typically relate to servicing of the entire Aura development. While the works are not triggered by the current application, the development contributes to the EP trigger values and works will be required to service the site across all phases. As such, the items specified within Schedule 3 are relevant to this application.

6.1 Land Contributions

Table 6-1 outlines the land contributions to be delivered as part of Precinct 13 and broader Aura development.

TABLE 6-1: LAND CONTRIBUTIONS

SCHEDULE 3 – IA LAND CONTRIBUTIONS			
IA ITEM	DESCRIPTION	TIMING	CONTRIBUTED BY
2.1.3	Land required to facilitate sewerage rising mains from SPS A and SPS001 north to Caloundra Road.	Land required to be delivered to service Aura Precinct 13 development.	Developer
2.1.4	Land required to facilitate major pump station SPS001 with access within the Master Plan Priority Development Area	Land required to be delivered to service Aura Precinct 13 development.	Developer
2.1.5	Land required for two water supply reservoirs.	Land required to be delivered to service Aura Precinct 13 development. Initial Reservoir is triggered with Phase 2 works after 22,000 EP horizon and the second reservoir is triggered within the 30,000 EP horizon.	Developer
2.1.3	Land required to facilitate sewerage rising mains from SPS A and SPS001 north to Caloundra Road.	Land required to be delivered to service Aura Precinct 13 development.	Developer
2.1.4	Land required to facilitate major pump station SPS001 with access within the Master Plan Priority Development Area	Land required to be delivered to service Aura Precinct 13 development.	Developer
SCHEDULE 4 – IA LAND CONTRIBUTIONS			
1.01	Land Contributions associated with the Works Contributions in Schedule 4	As necessary for provision of water supply and wastewater works.	Developer

6.2 Water Supply Works Contributions

Table 6-2 outlines the water supply works contributions to be delivered as part of Precinct 13 development.

TABLE 6-2: WATER SUPPLY WORKS CONTRIBUTIONS

SCHEDULE 3 – IA WATER SUPPLY CONTRIBUTIONS			
IA ITEM	DESCRIPTION	TIMING	CONTRIBUTED BY
1.1.1	Ultimate External (Water Supply) Connecting Works	Infrastructure required to be delivered prior to the greater Aura development resulting in a total demand of 15,001 EP.	Unitywater
SCHEDULE 4 – IA WATER SUPPLY CONTRIBUTIONS			
2.06	Potable water trunk main from Point W07 to Point W38 – DN500 (Previously DN375) trunk water main	Main required to be delivered prior to the greater Aura development resulting in a total demand of 15,001 EP.	Developer
2.09	Potable water trunk main from Point W05 to Point W06 (part) – 300mm diameter main	No Longer Required – Replaced by Single DN500 trunk main	-
2.10	Potable water trunk main from Point W26 to Point W07 – 500mm diameter main	Main required to be delivered prior to the greater Aura development resulting in a total demand of 15,001 EP.	Developer
2.11	Potable water trunk main from Point H to Point W26 – 600mm diameter main	Main required to be delivered prior to the greater Aura development resulting in a total demand of 15,001 EP.	Developer

6.2.1 High Risk Infrastructure

It has been deemed that there is no high-risk water infrastructure directly linked to the proposed Aura Precinct 13 development as defined within Schedule 8 of the IA.

6.3 Wastewater Supply Works Contributions

Wastewater works contributions to be delivered as part of the Aura Precinct 13 development are outlined in Table 6-3.

TABLE 6-3: WASTEWATER WORKS CONTRIBUTIONS

SCHEDULE 3 – IA WASTEWATER SUPPLY CONTRIBUTIONS					
IA ITEM	DESCRIPTION			TIMING	CONTRIBUTED BY
1.1.2	Ultimate Connecting Works	External (Wastewater)		Infrastructure required to be delivered prior to the greater Aura development resulting in a total demand of 15,001 EP.	Unitywater

6.3.1 High Risk Infrastructure

It has been deemed that there is no high-risk wastewater infrastructure directly linked to the proposed Aura Precinct 13 development as defined within Schedule 8 of the IA.

7 CONCLUSIONS & RECOMMENDATIONS

Investigation of the water and wastewater servicing strategies for the proposed development found that DSS were met across all relevant planning horizons. It is recommended that Unitywater approve the FPNP and connection approval of the development based on the following conclusions.

- The proposed development will consist of commercial and low impact industrial, with an ultimate population of 1,431 EP.
- The revised population projection is 669 EP less than previously assessed in the Infrastructure Master Plan.
- Development is anticipated to commence during Phase 2 (22,001 EP – 30,000 EP) with a demand of 250 EP, with Precinct 13 fully occupied (1,431 EP) during Phase 3 (30,001 EP – 45,000 EP).
- Updated network models were provided by Unitywater to enable network assessment. These models have been created using a different software (InfoWorks) and planning horizons to versions used previously.
- With population forecasts below previous planning assumptions, assessment of infrastructure performance has been limited to internal infrastructure proposed within Precinct 13.

The following provides a summary of the major trunk infrastructure requirements for each phase of development.

- Phase 1: 0 - 22,000 EP
 - No development within Precinct 13
- Phase 2: 22,001 – 30,000 EP
 - Proposed Precinct 13 development demand of 250 EP.
 - DN200 water main connection to existing DN800 watermain along Central Avenue, supplying a dual DN150 water reticulation network throughout Precinct 13 to support commercial and industrial development as shown in Figure 4-5.
 - DN250 gravity sewer extending from Precinct 13 and connecting into the existing DN355 stub at MH5365191, located immediately east in Precinct 12. DN160 internal gravity sewers servicing Precinct 13 and connected to the DN250 gravity sewer as shown in Figure 5-3.
- Phase 3: 30,001 – 45,000 EP
 - Proposed Precinct 13 development demand of 1,431 EP.
 - External trunk water and sewer infrastructure augmentations as per the revised Infrastructure Master Plan, however no upgrades are directly triggered by Precinct 13.
- Phase 4: 45,001 – 60,000 EP
 - Proposed Precinct 13 development demand of 1,431 EP.
 - External trunk water and sewer infrastructure augmentations as per the revised Infrastructure Master Plan, however no upgrades are directly triggered by Precinct 13.
- Phase 5: 60,000 EP - 85,284 EP
 - Proposed Precinct 13 development demand of 1,431 EP.
 - External trunk water and sewer infrastructure augmentations as per the revised Infrastructure Master Plan, however no upgrades are directly triggered by Precinct 13.

Connection works and associated land contributions as per Figure W2 of the Infrastructure Agreement will be triggered with the completion of the proposed development.

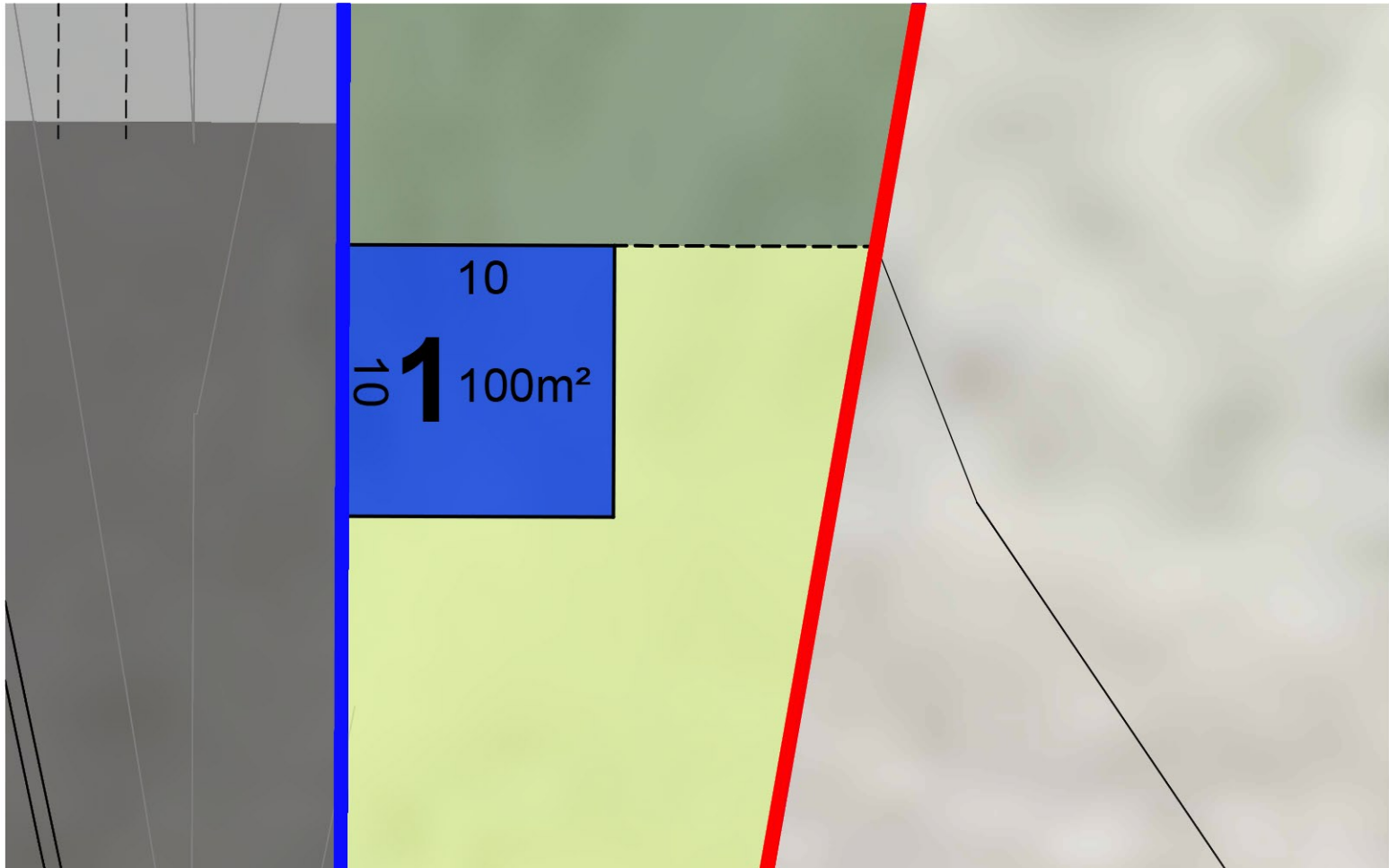
As demonstrated in this report, water and wastewater service strategies satisfy DSS during all phases of development. Egis recommend that the strategies proposed within this report be adopted and expanded upon during subsequent detailed design of individual development stages.

As such, we request Unitywater provide approval of the FPNP for the proposed Precinct 13 development.

APPENDIX A: PROPOSED LAYOUT



Source Information:
Site boundaries: Registered Survey Plans.
Adjoining information: DCDB.
Contours: EGIS
Aerial photography: NEARMAP 2025
Environment constraints: EGIS



**AURA
PRECINCT 13
RECONFIGURATION OF LOT PLAN**

PLAN REF: **17546 – 03**

Rev No: **O**

DATE: 28 AUGUST 2026

CLIENT: STOCKLAND

DRAWN BY: SE/GM

CHECKED BY: CC



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