Catherine Fields – Springfield Rd North

Water and Wastewater Assessment

Springfield Rd Pty Ltd

29 October 2024

→ The Power of Commitment

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1. Introduction

Springfield Rd Pty Ltd (the developer) has submitted a planning application to Camden Council for the rezoning of a proposed development in the Catherine Fields precinct. Sydney Water (SW) is a referral authority for the planning submission for drinking water and wastewater servicing of the proposed development.

The developer requires SW support for the Planning Proposal to Camden Council to rezone the proposed development site within the Catherine Field Precinct, with the statutory planning process taking at least 24 months to complete. The developer wishes to work with SW to facilitate the support of the rezoning to progress the statutory approval process.

To date, in response to the pre-lodgement planning proposal for rezoning of the Springfield Rd North site, SW has advised Camden Council:

– That due to constraints in the existing water and wastewater networks to service the proposed site, SW does not support the rezoning at this time.

GHD Pty Ltd (GHD) has been engaged by the developer to review the water and wastewater systems servicing for the area, and undertake a review of current and future servicing strategies to assess if other potential options exist to service the development in the interim and prior to full implementation future works being completed by SW to service these areas.

1.1 Background

The Catherine Field Precinct is located within the Camden Local Government Area and is approximately 42 kilometres south-west of the Sydney CBD (see Figure 1). The planning proposal to which this project relates has been lodged with Camden Council for rezoning within the Catherine Field Precinct to enable urban development for new housing, open space and recreation, riparian protection, major roads and stormwater management.

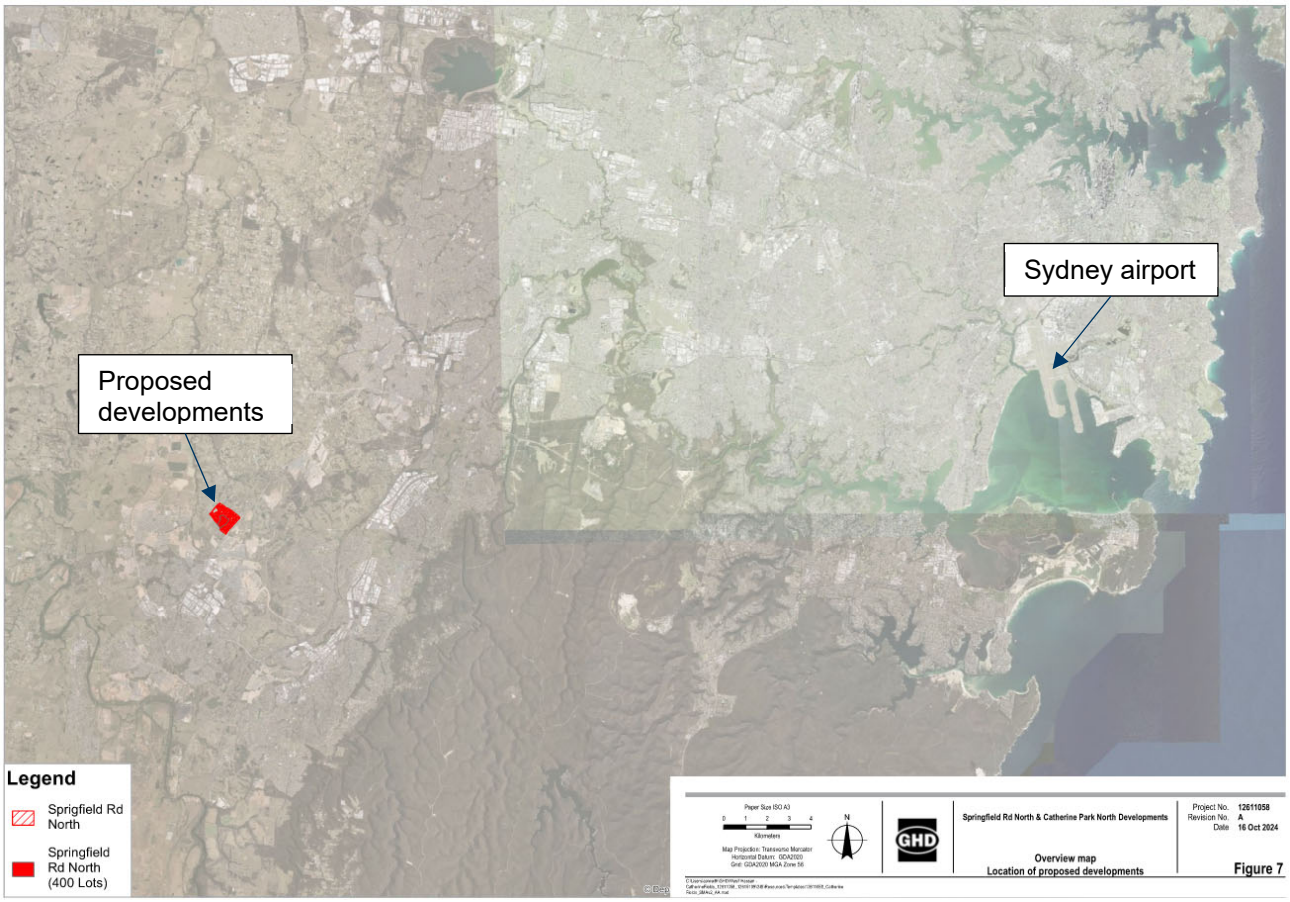

Figure 1 Location of proposed Springfield Rd North development

1.1.1 Overview of proposed rezoning planning timeframes

The proposed rezoning of the subject lands in the Catherine Fields precinct is a statutory Planning Proposal process with Camden Council, in accordance with NSW Government Planning requirements. Broadly the Planning Proposal lodgement process is as follows:

1. Pre-lodgement meeting
2. Prepare Planning Proposal
3. Significant Planning Proposals
4. Submission

The Planning Proposal Assessment key steps are outlined in Figure 2 below.

Figure 2 Planning Proposal Assessment key steps (extracted from: www.camden.nsw.gov.au, 22/07/2024).

Advice from the developer is that the Planning Proposal process will take at least 2-years. Development approval (via the Development Application (DA) process) will also be required, even if this is undertaken partially in parallel with the Planning Proposal process, this would take a further 10 - 12 months.

See Figure 3 for a high-level timeline for the Camden Council planning process which is required prior to the application for a Section 73 certificate with SW[1].

The developer is seeking options to progress the rezoning with Council prior to SW implementing the future servicing strategies for the Catherine Fields precinct. A way forward is for SW to consider providing an amended Planning Proposal response to Camden Council for the Planning Proposal that advises that SW **does** support the proposed rezoning of Springfield Rd North, subject to certain criteria being met.

[1] Based on information provided to SW in email dated 01/11/2023

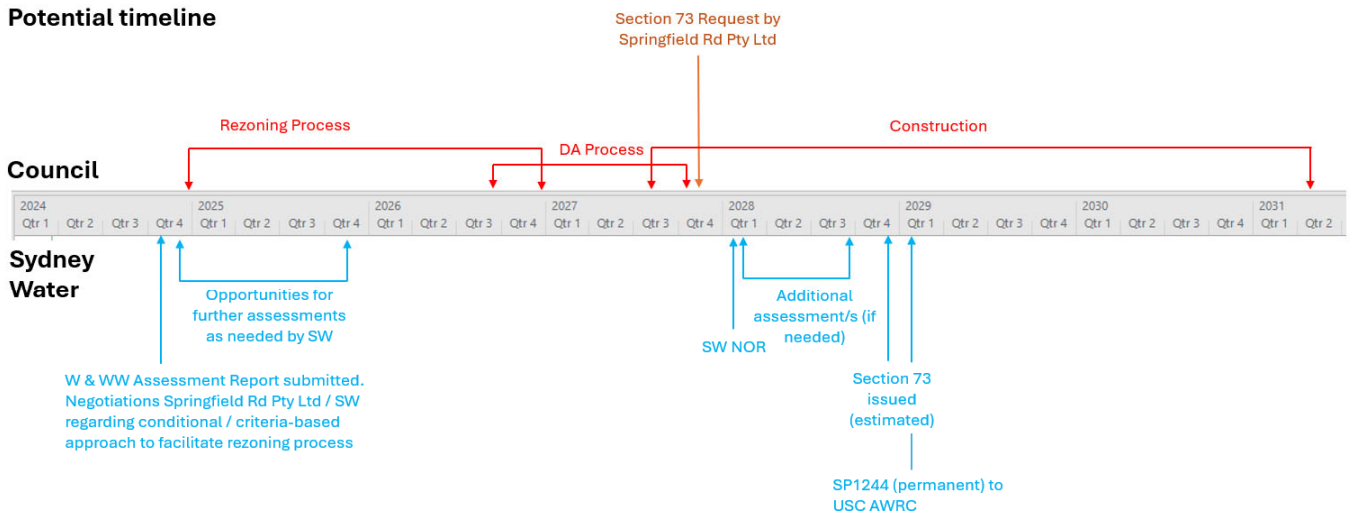

Figure 3 High level timeline for planning processes with potential timelines

The timeline presented in Figure 3 also shows what is needed by the developer to meet current delivery schedule should SW decide that they can support rezoning for the proposed development. An approach was made to SW to see if an approach based upon a conditional approval is possible. As per email from SW to GHD dated 25 July 2024, Sydney Water advised:

- That a 'Conditional Approval' cannot be provided.
- An amended Planning Proposal response is dependent on endorsed detailed 'interim/alternative' options report and potentially Commercial Agreement to ensure delivery.
- If a conditional/criteria based approach is to pursued, the proponents need to demonstrate how this will operate whilst eliminating risk to Council and SW.

In addition to the above, SW advised in comments dated 09 October 2024, that until the proponents can demonstrate rezoning controls that would eliminate risk to SW and Council, SW cannot endorse the Planning Proposal without detailed options assessment being completed.

SW has also stated:

– “Accelerated developments, delivering interim infrastructure not aligned with SW ultimate servicing are fully developer funded. Whilst this may be reviewed and implemented via a Commercial Agreement, the standard position is the former.”

1.2 Purpose of this report

The purpose of this report is to present potential water and wastewater servicing options for the proposed development of Springfield Rd North to facilitate the negotiations between the developer and SW for progressing the rezoning Planning Proposal with Camden Council.

1.3 Scope and limitations

This report: has been prepared by GHD for Springfield Rd Pty Ltd and may only be used and relied on by Springfield Rd Pty Ltd for the purpose agreed between GHD and Springfield Rd Pty Ltd as set out in section1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Springfield Rd Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.3 and 1.4 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.4 Assumptions

The information in this report is based on the following.

Information supplied by:

– Colliers (on behalf of Springfield Rd Pty Ltd):
  - Presentation to SW dated 27 February 2023
  - Water and Sewer Options Report - Catherine Field Planning Proposal, Charlesworth Close, Springfield Road, Camden Valley Way and Catherine Field Road (Colliers / Craig & Rhodes, June 2023)
  - IOP / Decentralised cost estimation (via email dated 26 March 2024)
– Sydney Water – refer to references contained in the following:
  - Water Basis of Planning for Catherine Fields rezoning areas (proposed Springfield Rd North, and Catherine Park North Developments) Memo (GHD, dated 03 July 2024).
  - Wastewater Basis of Planning for Catherine Fields rezoning areas (proposed Springfield Rd North, and Catherine Park North Developments) Memo (GHD, dated 06 June 2024).

2. Springfield Rd North rezoning area

Rezoning is being sought for Springfield Rd North, land owned by Springfield Rd Pty Ltd:

- Proposed to be a low-density residential development.
- Rezoned area of approximately 104 hectares proposed to ultimately comprise of 2,080 lots.
- Springfield Rd Pty Ltd owns approximately 13 hectares of the land, to comprise of around 400 lots by Year 2029.
- Interim servicing may be required for drinking water and wastewater servicing of 400 lots.
- Located in the following current SW drinking water and wastewater areas:
  - Drinking water - water supply zone (WSZ) and network:
    - Leppington Elevated WSZ.
    - Refer to Figure 4 for current system arrangement and location of the proposed development relative to Leppington Elevated and the surrounding water supply zones which include Leppington, Oran Park, Narellan South, and Currans Hill.

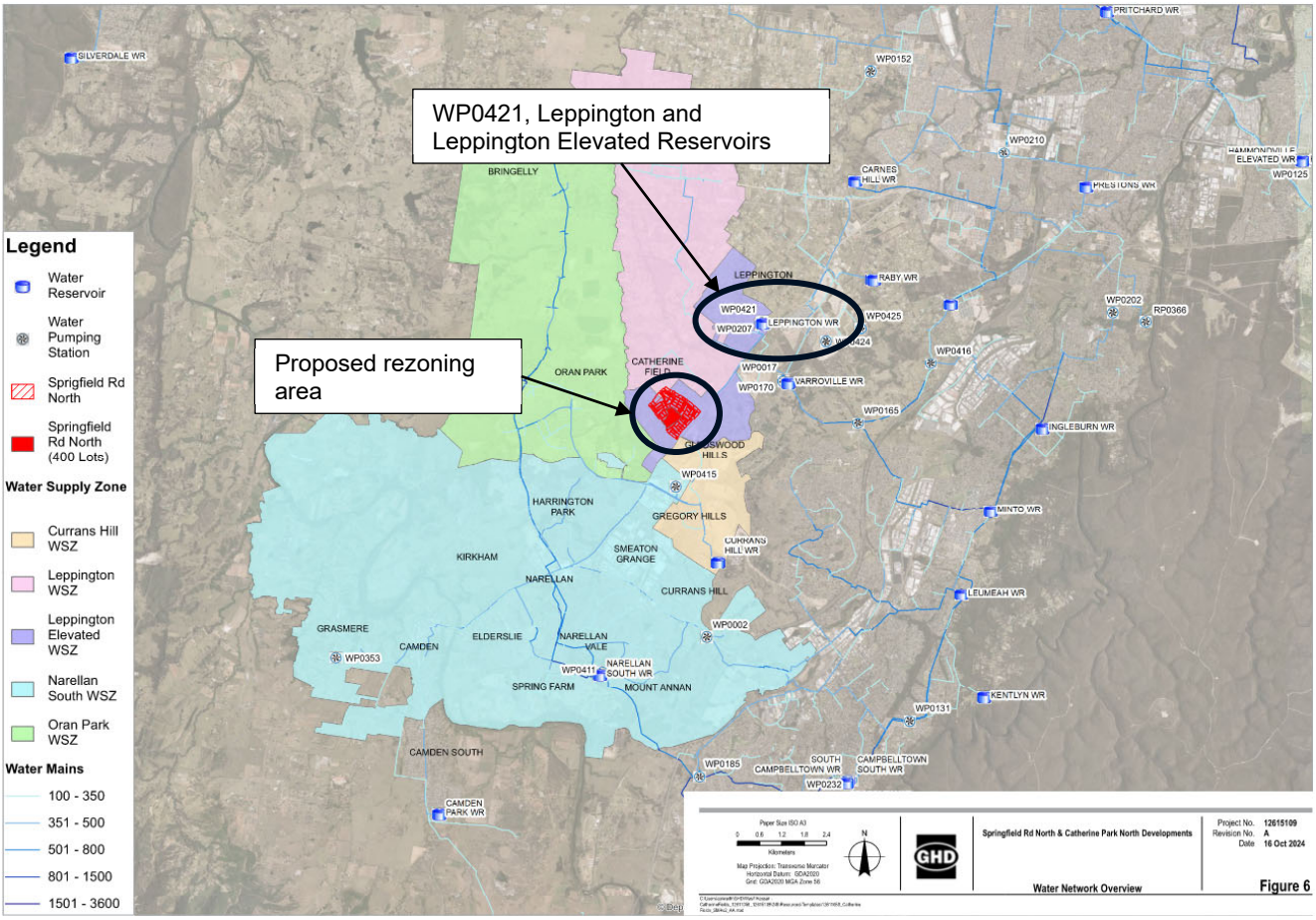

Figure 4 Overview of drinking water system and location of proposed Springfield Rd North rezoning area

- Wastewater catchment and network:
  - West Camden catchment.
  - If connected to current system the proposed development wastewater would be transferred via temporary package pump station and rising main, then drain by gravity to SP1156, then to West Camden WRRP - it is noted that SW currently does not support connection to the current network.
  - Refer to Figure 5 for current system arrangement and location of the proposed rezoning area relative to the West Camden wastewater system.

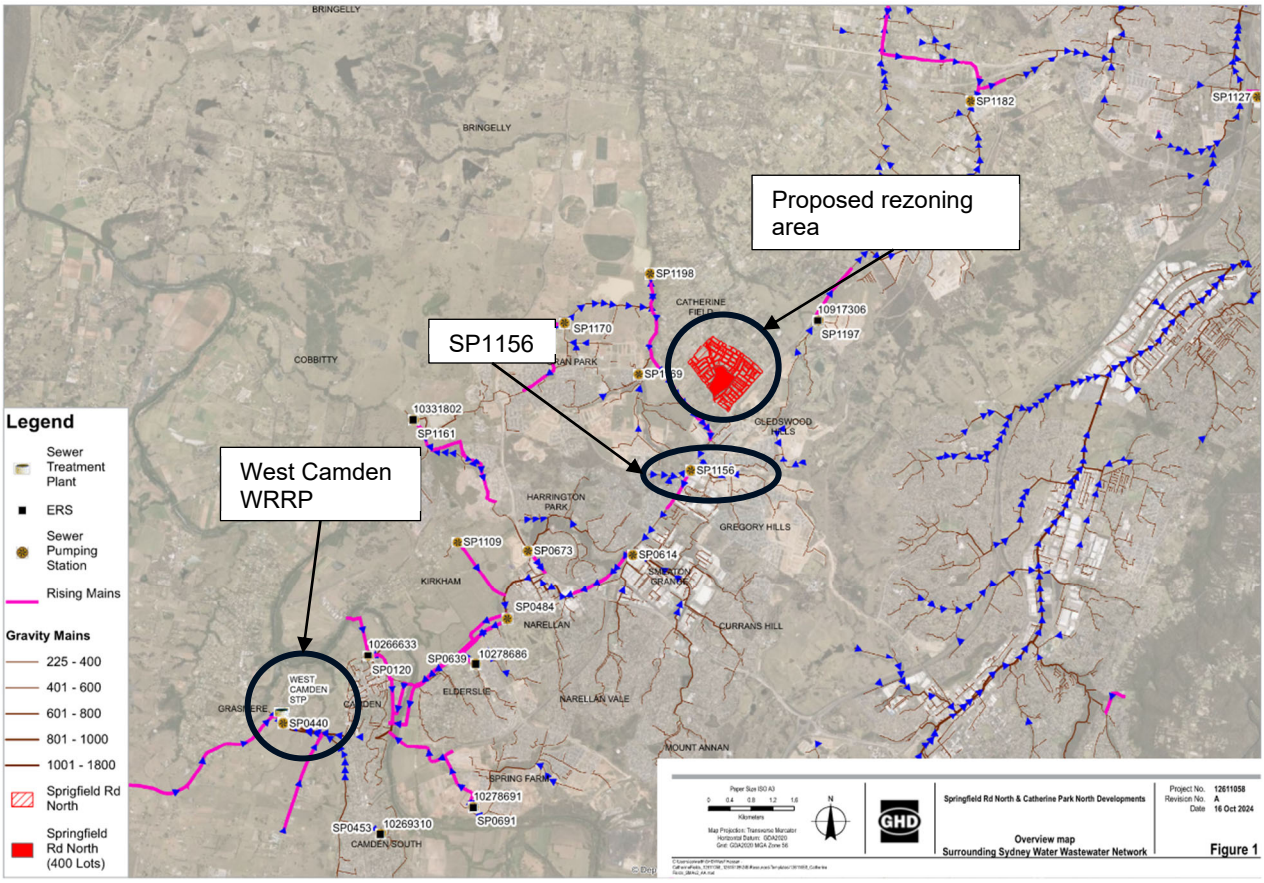

Figure 5 *West Camden wastewater system and location of proposed Springfield Rd North rezoning area*

2.1 Water demand

The staging, occupancy rate and drinking water demand are shown in Table 1. For further details refer to Appendix A (Water Basis of Planning, GHD September 2024).

Table 1 *Springfield Rd North Development staging and drinking water demands*

Stage	No. lots	Section 73 issued by SW	Population[2]	ADD[3] (kL/day)	MDD[4] (kL/day)
1	200	06/2027	600	108.0	194.4
2	200	06/2028	600	108.0	194.4
Total	**400**	-	**1,200**	**216.0**	**388.8**

2.2 Wastewater loading

The staging, equivalent persons (EP) and wastewater loading of the development are shown in Table 2. For further details refer to Appendix B (Wastewater Basis of Planning, GHD October 2024).

[2] Occupancy rate of 3.0 per lot (low density residential) - SW email dated 27th June 2024
[3]ADD of 180 L/person/day - SW email dated 30th April 2024
[4]Factor of 1.8 for MDD - SW email dated 30th April 2024

Table 2 Springfield Rd North Development staging and wastewater loading

Stage	No. lots	Section 73 issued by SW	Equivalent Persons (EP)[5]	Loading (kL/day)[6]	Cumulative loading (kL/day)
1	200	03/2027	700	115.50	115.50
2	200	03/2028	700	115.50	231.00
Total	**400**	**-**	**1,400**	**231.00**	**-**

[5] Occupancy rate of 3.5 (EP) per unit (WSA Code-02 2014)
[6] Loading rate of 150 L/day/EP, and 10% baseflow (Sydney Water Network Planning Guideline 2021)

3. Sydney Water current and future drinking water servicing

3.1 Current water servicing

Under the current system arrangement, the proposed rezoning areas are located within the Leppington Elevated WSZ which is serviced via the elevated reservoir WS0344. WS0344 is filled via WSP0421 which feeds off the Leppington WSZ. Both WSZs are part of the larger Macarthur water delivery system.

SW have advised of the following system constraints:

– Hydraulic modelling has identified significant capacity issues to service growth in the related WSZs of Campbelltown South, Minto, Varroville, Raby, and Leppington WSZs. The capacity issues include pressure, water storage as well as limits to the transfer rate of mains between Narellan South/Campbelltown South WSZs to the Minto WSZ[7].
    - Capacity issues also exist in Curran's Hill and Oran Park WSZ.
– Macarthur Water Filtration Plant (WFP) is at capacity and there are existing reliability issues.

Due to the constraints listed above, the servicing strategy currently being implemented is:

– Rezone parts of the network. Adjacent WSZs are to maintain operating licence. Rezoning completed by early 2025.
– Creation of a new Oran Park WSZ to be serviced by the new Oran Park Reservoirs.
    - The north section of Narellan South WSZ will be rezoned into the Oran Park WSZ
    - The west section of the Leppington WSZ will be rezoned into the Oran Park WSZ
– The Austral precinct part of Raby WSZ to be rezoned to Cecil Park WSZ
– South-western section of the Raby WSZ will be rezoned into the Leppington Elevated WSZ.

3.2 Future system servicing strategy

SW have advised an extensive program of works will be undertaken for the northern end of the Macarthur System under the Greater Macarthur program of works (GMAC), with the intent of this work to relieve the capacity issues outlined in section 3.1. This program of works by SW is expected to be completed around Year 2031.

3.2.1 Servicing strategy timing

Refer to Table 3 for summary of staging of SW's servicing strategy in relation to the planned servicing requirements of the proposed development, and Figure 6 for SW servicing strategy in relation to the proposed development.

Table 3 Sydney Waters' indicative current and future strategy description

Staging Year	SW's planned works
End of Year 2024 to Early 2025	Creation of Oran Park WSZ and reservoirs. Rezoning of Narellan South, Leppington, Leppington Elevated, Raby and Cecil Park WSZs.
End of Year 2031	Extensive program of works (under GMAC) to the upstream networks of the Macarthur water distribution system.
2031 onwards	Upgrades to the Macarthur WFP to increase capacity and improve reliability.

[7] Minto WSZ feeds Leppington and Leppington Elevated WSZ.

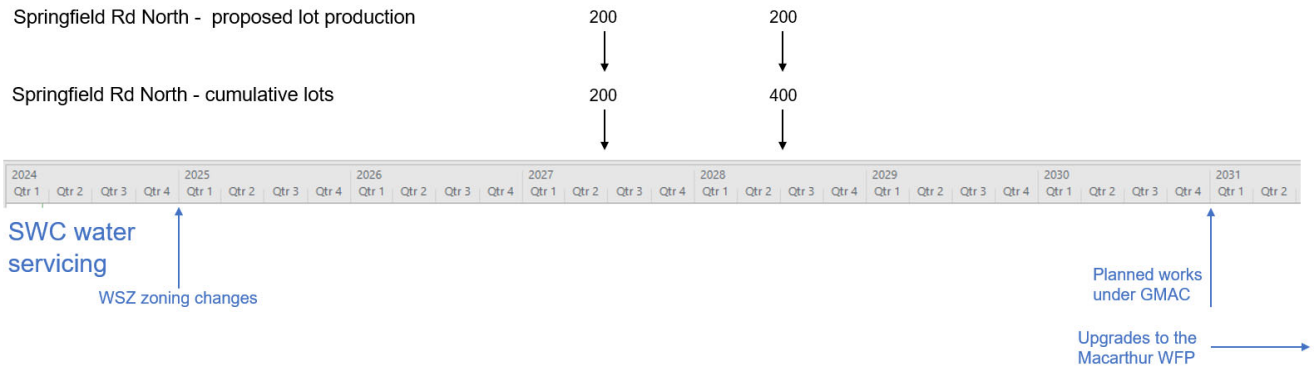

Figure 6 ***Sydney Waters' indicative current and future strategy timeline***

4. Sydney Water current and future wastewater servicing

4.1 Current wastewater servicing

Under the current system arrangement, the proposed rezoning area is located within the West Camden wastewater collection system, draining to West Camden WRRP.

SW have advised of the following constraints of the system:

- West Camden WRRP has no capacity for biological treatment, average dry weather flow (ADWF) and peak wet weather flow (PWWF).
- Augmentations are required within the West Camden wastewater network to meet environment protection licence (EPL) conditions.
  - A license condition of the EPL is a target number of wet weather overflows which SW cannot exceed in a 10-year period.
- The flow rate for SP1198 is throttled to 155 L/s due to capacity issues in the downstream gravity carrier located in Camden Valley Way.
- There are also capacity limitations in SP1156 and the downstream wastewater network.

Based on advice from SW, and the West Camden Water Recycling Plant Upgrade information sheet (see Appendix C), the servicing strategy currently being implemented is:

- West Camden WRRP upgrade to service growth in the catchment as well as maintain compliance with the EPL into the future:
  - Delivery by end of 2025.
  - Double the treatment plant's capacity and ensure sufficient capacity to service 176,000 people by 2046.
  - In the short term cater for temporary flows from South West Growth Area until Upper South Creek (USC) Advanced Water Recycling Centre (AWRC) is operational.
  - SW is implementing new membrane bio-reactor technology at the treatment plant which will allow for treated water to be released through environmental flows. This treated water can be used for recreational purposes and local agricultural businesses.
- Upgrade of SP1156 (network south of proposed developments) and the delivery of SP1209 (north of the developments). Both pump stations deliver flows to West Camden WRRP following its upgrade.
  - Temporary SP1209 is scheduled for delivery at the end of Year 2025.
  - The upgrade of SP1156 is to service the land located within the Lowes Creek catchment, prior to the transfer to USC AWRC being commissioned. However, SW have advised that this upgrade is not able to service the proposed developments.
- Assessment and optioneering for the West Camden wastewater network is being undertaken by SW, in order to meet EPL requirements.

4.2 Future system servicing strategy

Under the future system arrangement (approximately Year 2031), the development will form part of the Lowes Creek wastewater collection system, transferring via the Rileys Creek carrier and SP1244 for treatment at the new USC AWRC.

SW advised the future servicing strategy is as follows:

- The USC AWRC will be operational in Year 2026, and the USC catchment flows will be progressively directed to it.
- Flows from the Lowes Creek catchment will begin to be re-directed to the USC AWRC in Year 2028/29.

- SP1198 catchment (also known as the Lowes Creek catchment) will be diverted to the USC AWRC when the new SP1244 and associated infrastructure linking SP1244 to the AWRC is commissioned (scheduled for 2028/29).

– The Catherine Fields precinct will be transferred via future gravity carriers and pumping stations to the USC AWRC (see Figure 7).
  - The Springfield Rd North development will flow northeast, with the trunk infrastructure scheduled to be operational 2030/31.

– SP1209 will be replaced with SP1244 in Year 2028/29 ("Lowes Creek Catchment Permanent Servicing Assessment").

4.2.1 Servicing strategy timing

Refer to Table 4 and Figure 7 for summary of staging of SW's servicing strategy in relation to the planned servicing requirements[8] of the proposed development (refer to section 2.1 for lot staging), and Figure 8 for SW infrastructure servicing strategy in relation to the proposed development.

Table 4 Sydney Water's indicative current and future strategy description

Staging Year	SW's planned works[9]
End of Year 2025 / start of Year 2026	USC AWRF operational, and West Camden WRRF upgrade complete. Upgrade of SP1156, and construction of new temporary SP1209 to deliver flows to West Camden WRRF.
Middle of Year 2028	SW shall deliver gravity trunk mains from SP1198 to SP1209/SP1244.
Start of Year 2029	Permanent SP1244 operational.
≈ 2030/31	Deepfield Rd and Rileys Creek Rd carriers and new SPS to SP1244 constructed.

[8] Lot timing adopted as issue of Section 73 Certificate by SW.
[9] SW have advised timing subject to funding approval and delivery alignment with SW's delivery partner schedules.

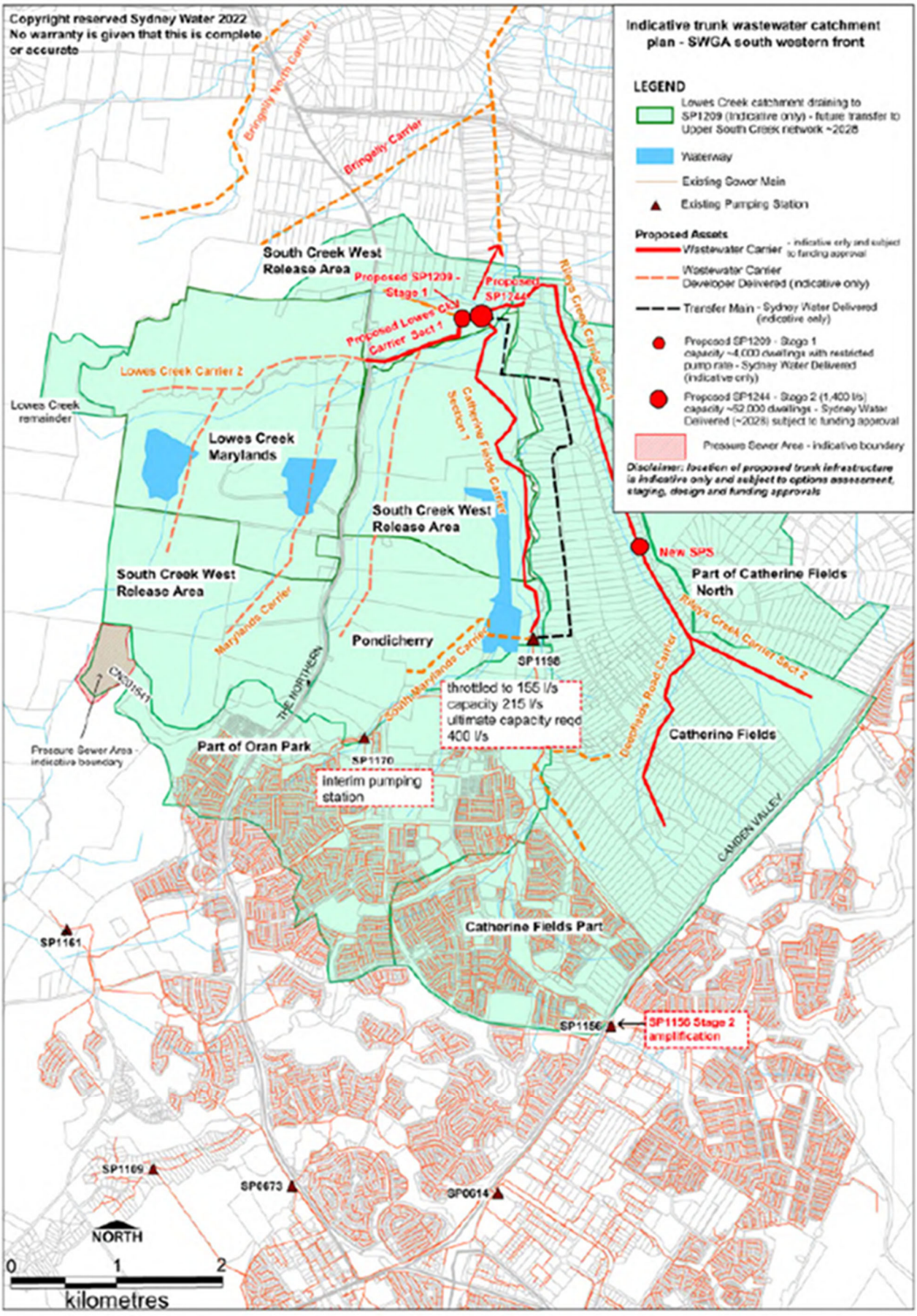

Figure 7 *Sydney Water wastewater servicing strategy*

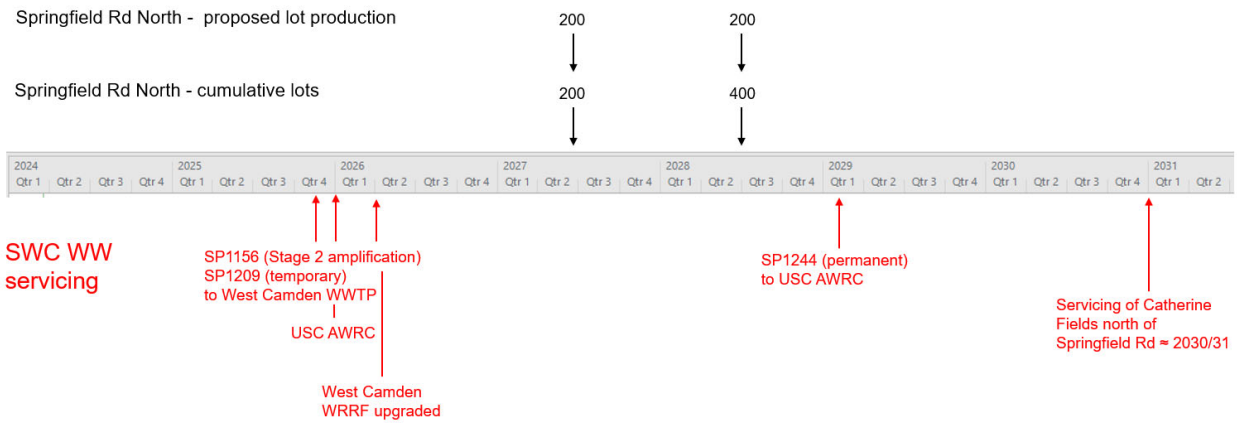

Figure 8 ***Sydney Water's indicative current and future strategy timeline***

5. Summary of population, growth timing and projected water demand and wastewater loading

5.1 Drinking water assessment

5.1.1 Current population and demand

Table 5 Total current demands by WSZ

WSZ	Total No. Job	ADD 2023 (ML/d)	MDD 2023 (ML/d)
Oran Park	2,800	0.28	0.50
Narellan South	29,513	2.95	5.31
Leppington	3,043	0.30	0.55
Currans Hill	1,807	0.18	0.33
Leppington Elevated	494	0.05	0.09
Total	**37,657**	**3.77**	**6.78**

5.1.2 Growth forecast

Residential growth projections are based on Sydney Water's Urban Growth Intelligence (UGI) and the Department of Planning Infrastructure and Environment's (DPIE's) Housing Supply Forecast Model (HSFM). A summary of the cumulative population and job numbers for infill and greenfield growth per WSZ is summarised in Table 6 and Table 7, and presented spatially in Figure 9 and Figure 10.

These tables formed the basis of the demand projections which can be used to update hydraulic models for future demand scenarios. The adopted occupancy ratios have been taken from the UGI data set which varies from 1.3 to 3.1 population/dwelling for low density residential and varies from 1.3 to 2.6 population/dwelling for high density residential.

Table 6 Population summary for infill per WSZ

Infill Water Supply Zone	Type	2028	2031
Oran Park	Residential (LD)	0	0
	Residential (HD)	0	0
	Non-Residential (Job No.)	0	0
Narellan South	Residential (LD)	2,043	3,137
	Residential (HD)	91	143
	Non-Residential (Job No.)	1,262	1,606
Currans Hill	Residential (LD)	56	56
	Residential (HD)	0	0
	Non-Residential (Job No.)	17	22
Leppington	Residential (LD)	0	0
	Residential (HD)	0	0
	Non-Residential (Job No.)	0	0

Leppington Elevated	Residential (LD)	0	0
	Residential (HD)	0	0
	Non-Residential (Job No.)	0	0
Total	**Residential (LD)**	**2,099**	**3,193**
	Residential (HD)	**91**	**143**
	Non-Residential (Job No.)	**1,279**	**1,628**

Table 7 Population summary for greenfield per WSZ

Greenfield Water Supply Zone	Type	2028	2031
Oran Park	Residential (LD)	13,372	30,829
	Residential (HD)	1,332	4,334
	Non-Residential (Job No.)	1,365	3,312
Narellan South	Residential (LD)	4,764	5,317
	Residential (HD)	3,019	3,992
	Non-Residential (Job No.)	2,273	3,316
Currans Hill	Residential (LD)	1,416	1,434
	Residential (HD)	19	54
	Non-Residential (Job No.)	519	519
Leppington	Residential (LD)	352	2,201
	Residential (HD)	0	519
	Non-Residential (Job No.)	94	798
Leppington Elevated	Residential (LD)	2,948	7,358
	Residential (HD)	971	2,333
	Non-Residential (Job No.)	79	278
Total	**Residential (LD)**	**22,852**	**47,139**
	Residential (HD)	**5,341**	**11,232**
	Non-Residential (Job No.)	**4,330**	**8,223**

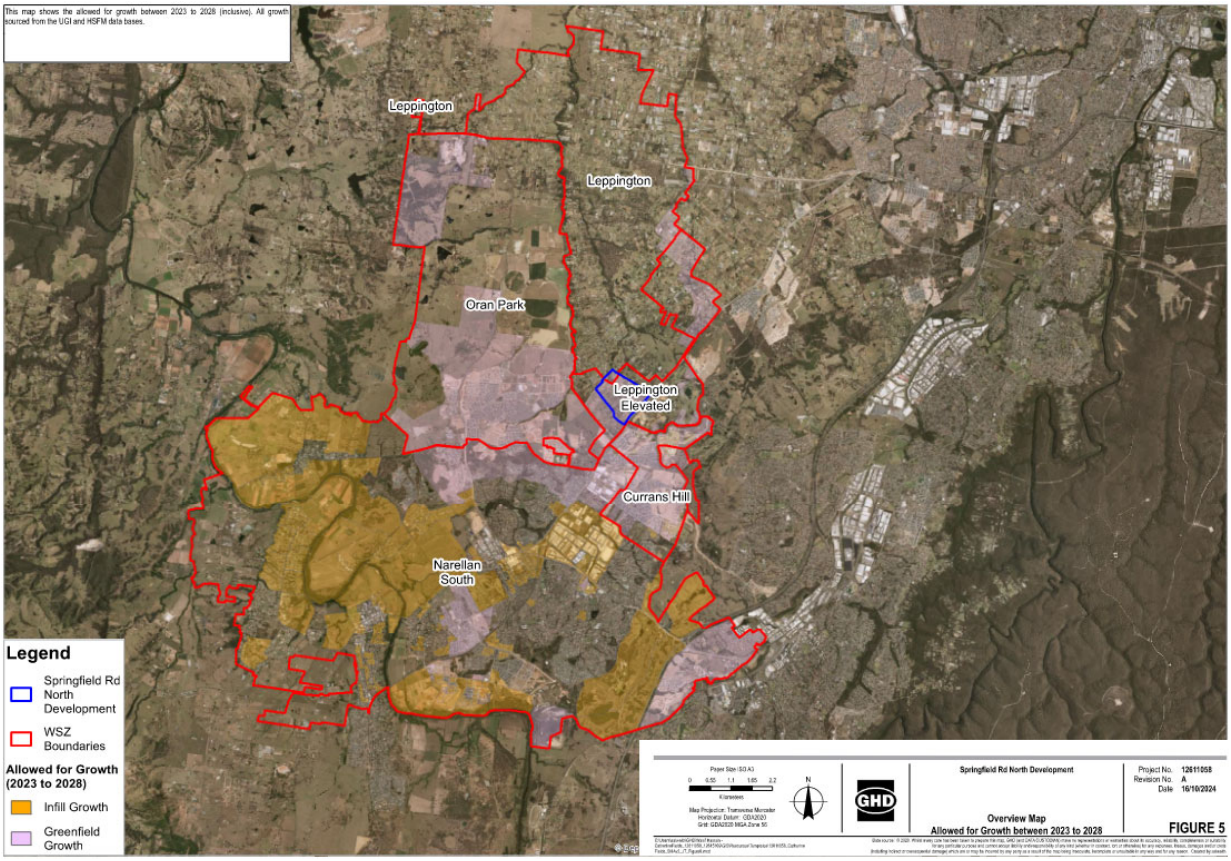

Figure 9 Growth between 2023 and 2028

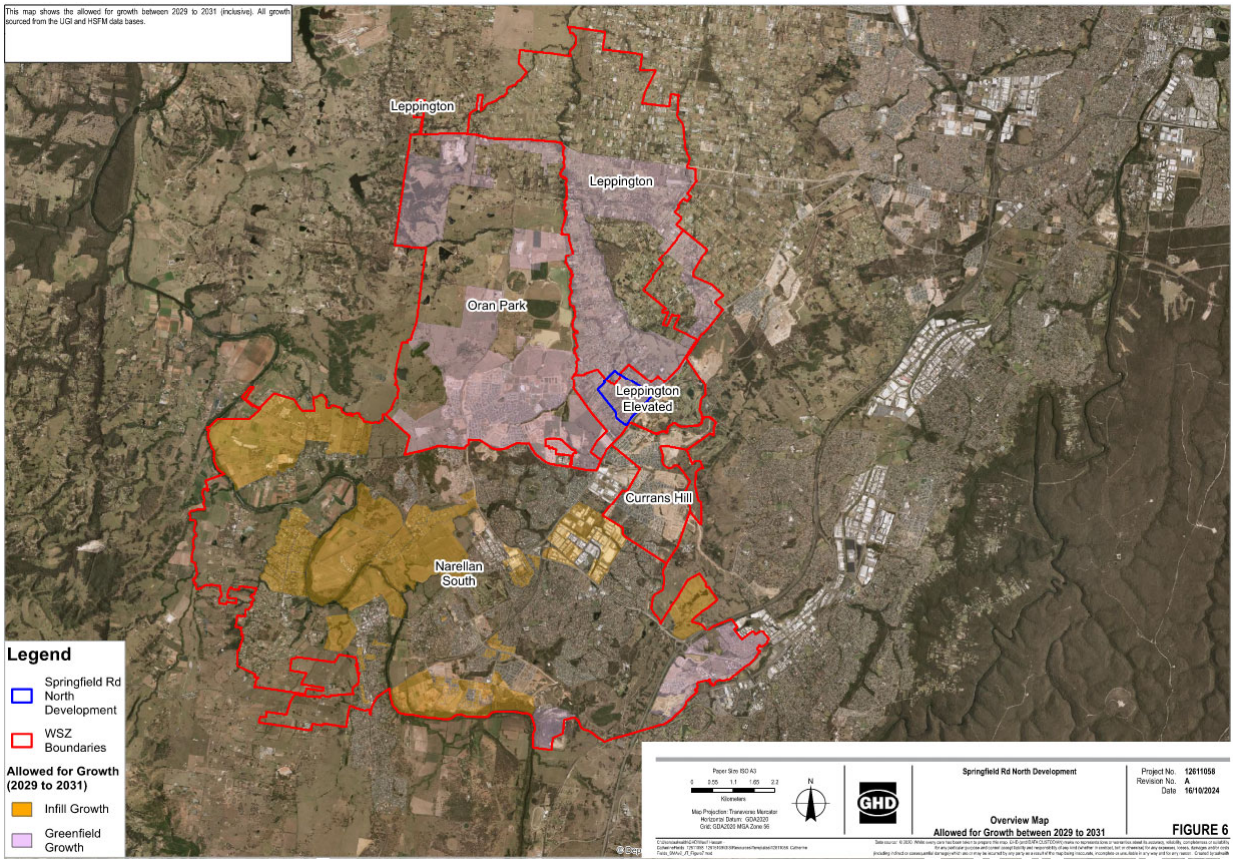

Figure 10 Growth between 2029 and 2031

5.1.3 Growth in Leppington Elevated WSZ

On review of the UGI and the HSFM data sets, it was found that a number of greenfield sites have been allocated in the Leppington Elevated Zone and includes the majority of the proposed Springfield Rd North Development site, see Figure 11. Greenfield sites including the proposed Springfield Rd North Development site are included in the UGI and the HSFM data. SW have advised that the growth data was used in GMAC project to identify the network infrastructure upgrades required to service the growth by 2031.

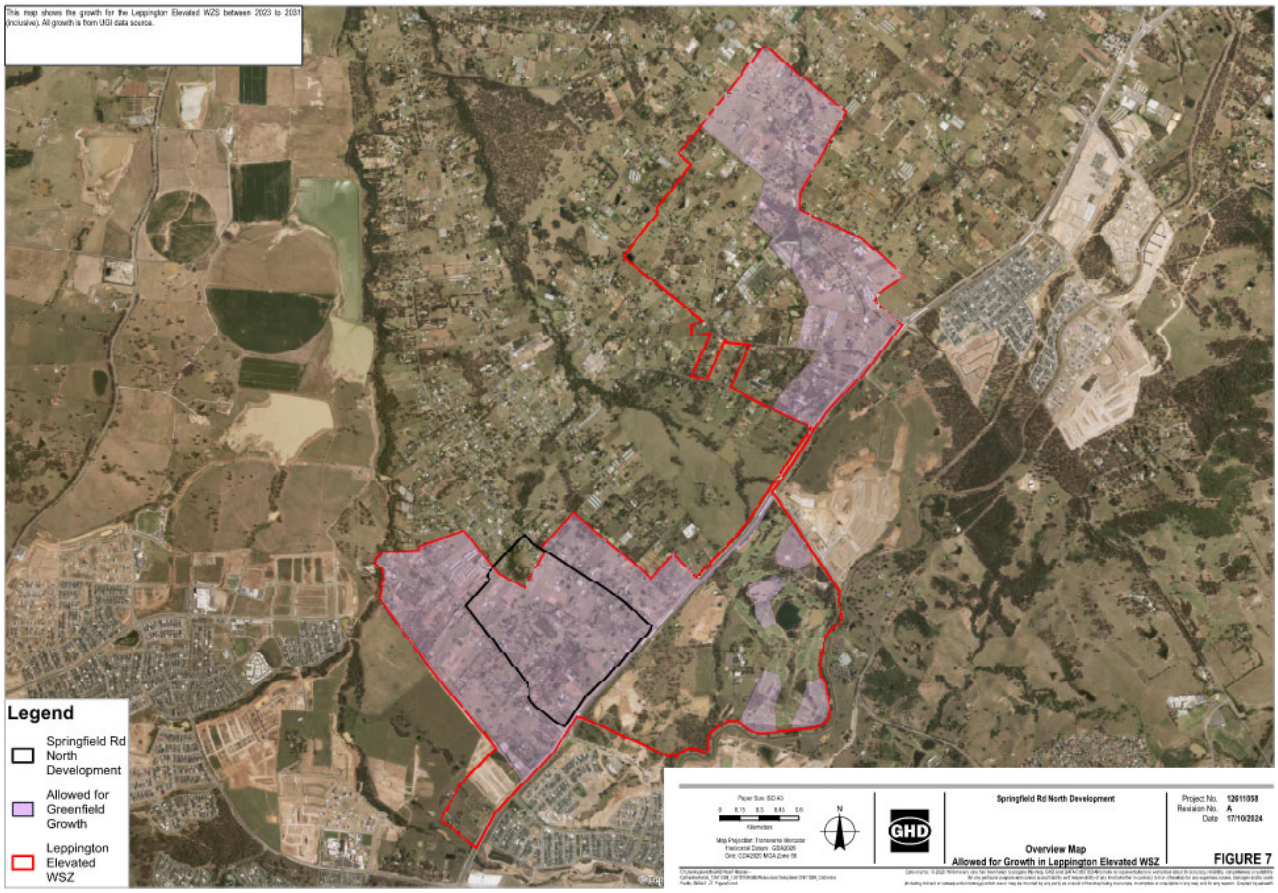

Figure 11 Growth in Leppington Elevated WSZ

The allowed for growth (in Figure 11), that is within the Springfield Road North Development area, is further detailed in Table 8 below.

Table 8 SW planned growth for GMAC assessment within Springfield Road North development area

Year	Number of Additional Dwelling Per Year	Total Accumulated Population	Total Accumulated MDD (ML/day)
2023	-	-	-
2024	-	-	-
2025	-	-	-
2026	-	-	-
2027	-	-	-
2028	184	553	0.18
2029	184	1,106	0.36
2030	184	1,659	0.54
2031	184	2,212	0.72
Total	**736**	2,212	0.72

5.1.4 Demand Projections

This section summarises the drinking water demand forecast for the study area based on SW growth forecasts.

Refer to Table 9 for a summary of the total ADD and MDD per demand category, for infill and greenfield.

Table 9 ADD and MDD per WSZ (including developments)

Water Supply Zone	Type	ADD in (ML/d)			MDD in (ML/d)		
		2023	2028	2031	2023	2028	2031
Oran Park	Residential (LD)	4.33	6.74	9.88	7.80	12.13	17.79
	Residential (HD)	0.13	0.37	0.91	0.24	0.67	1.64
	Non-Residential	0.28	0.42	0.61	0.50	0.64	1.10
	Sub-Total	**4.74**	**7.52**	**11.40**	**8.54**	**13.44**	**20.53**
Narellan South	Residential (LD)	13.17	14.40	14.69	23.71	25.92	26.45
	Residential (HD)	0.31	0.87	1.05	0.56	1.57	1.90
	Non-Residential	2.95	3.30	3.44	5.31	5.66	6.20
	Sub-Total	**16.43**	**18.57**	**19.19**	**29.58**	**33.15**	**34.54**
Currans Hill	Residential (LD)	2.81	3.07	3.08	5.05	5.53	5.53
	Residential (HD)	0.11	0.11	0.12	0.20	0.21	0.22
	Non-Residential	0.18	0.23	0.23	0.33	0.38	0.43
	Sub-Total	**3.10**	**3.42**	**3.43**	**5.58**	**6.12**	**6.18**
Leppington	Residential (LD)	0.61	0.67	1.01	1.10	1.21	1.81
	Residential (HD)	0.02	0.02	0.11	0.04	0.04	0.21
	Non-Residential	0.30	0.31	0.38	0.55	0.56	0.69
	Sub-Total	**0.93**	**1.00**	**1.50**	**1.69**	**1.81**	**2.71**
Leppington Elevated	Residential (LD)	0.40	0.93	1.72	0.72	1.68	3.10
	Residential (HD)	0.01	0.18	0.43	0.01	0.32	0.77
	Non-Residential	0.05	0.06	0.08	0.09	0.10	0.14
	Sub-Total	**0.46**	**1.17**	**2.23**	**0.82**	**2.10**	**4.01**
Catherine Park North and Springfield Rd North developments	Residential (LD)	-	0.32	0.76	-	0.58	1.36
	Residential (HD)	-	-	-	-	-	-
	Non-Residential	-	-	-	-	-	-
	Sub-Total	**-**	**0.32**	**0.76**	**-**	**0.58**	**1.36**
Totals	**Total Residential (LD)**	**21.32**	**26.19**	**31.26**	**38.38**	**47.14**	**56.28**
	Total Residential (HD)	**0.58**	**1.56**	**2.63**	**1.05**	**2.81**	**4.74**
	Total Non-Residential	**3.76**	**4.32**	**4.75**	**6.78**	**7.34**	**8.55**
	Grand Total	**25.66**	**32.01**	**38.51**	**46.21**	**57.20**	**69.34**

SW advised the proposed growth has been included for the options assessment in the GMAC study and trunk network upgrades are planned to be delivered by 2031. SW also advised that there is no capacity for the proposed development to connect to the existing SW network before 2031 without additional modelling to confirm staging and timing of when deficiencies may first become evident. Further modelling of the staging around the 2-3 years of timing when this development is requesting servicing is required to confirm the nature and extent of system upgrades if these are necessary prior to 2031.

5.2 Wastewater assessment

5.2.1 Current population and loading

Table 10 reports the population from Year 2023 to Year 2031. In general:

– The residential population increases from 111,660 (Year 2023) to 143,654 (Year 2031) people. This is an increase in total population by about 29% by Year 2031.
– The number of jobs increases from Year 2023 to Year 2031, from 62,066 to 64,485 jobs. This is an increase in total jobs by about 4% by Year 2031.

Table 10 Total residential population and number of jobs from Year 2023 to Year 2031 for the wastewater catchment

Pump station catchment	Year 2023	Year 2026	Year 2028	Year 2031
Residential population (EP)	111,660	123,895	131,799	143,654
Number of Jobs[10]	62,066	62,829	63,491	64,485

Table 11 reports the estimated wastewater flows due to residential and non-residential growth. These figures are based on a loading rate of 150 L/EP/day. In the West Camden wastewater catchment, in general:

– There is an increase in total flows from 18,844 kL/day (Year 2023) to 23,724 kL/day (Year 2031).
– In 5 years, this is an increase in total flow of approximately 3,880 kL/day, or equivocally 25% increase in total Year 2023 total flows.

Table 11 Flows for the catchment within the wastewater model (WC04) boundary

Flows	Year 2023	Year 2026	Year 2028	Year 2031
Residential Flows (kL/day)	16,749	18,584	19,770	21,548
Non-residential Flows (kL/day)[11]	2,095	2,120	2,357	2,176
Total Flows (kL/day)	**18,844**	**20,705**	**22,127**	**23,724**

Figure 12 shows the West Camden catchment and growth areas to the north-west (shown in pink).

[10] The number of jobs has been calculated based on estimated sewer discharge (kL/day) for the following dry weather flow types, “CommInd” and “Other Sewered”. We have excluded all “Residential” estimated sewer discharge from the calculation, as it is double counting population loading. All of the reported sewer discharge (kL/day) form part of the “SWC_Future_Population” table, and the calculation of job number is based on, the job conversion rate of 1 job = 0.225 EP, and 150 L/EP/day rate.
[11] Non-residential flows include commercial, industrial and other flows. This figure does not include baseflow. Baseflow is about 583 kL/day according to SW WC04 Model.

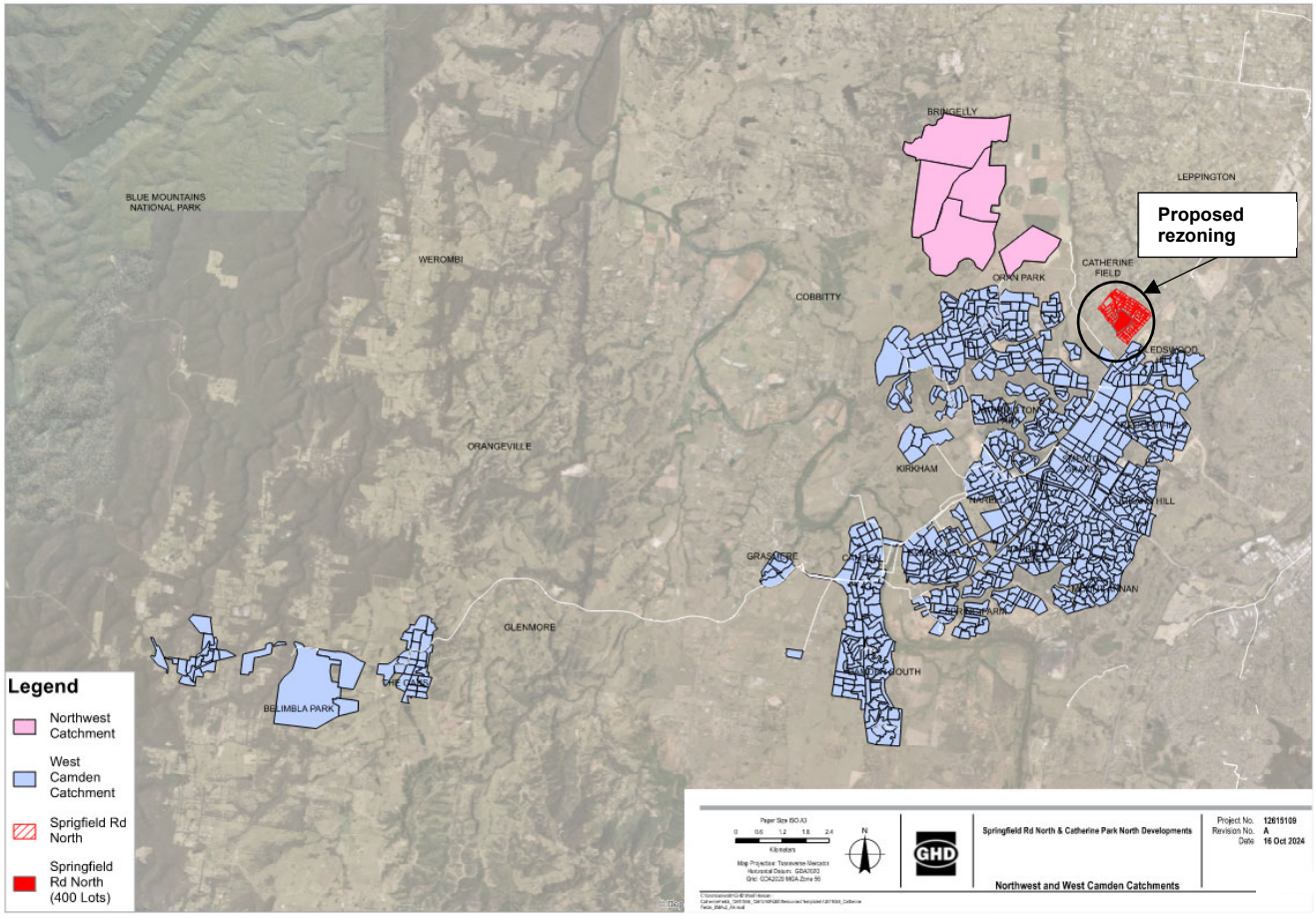

Figure 12 Wastewater catchments

5.2.2 West Camden WRRP capacity

The SW “West Camden Water Recycling Plant Upgrade” brochure reports the upgraded West Camden capacity as 176,000 EP. SW growth data and hydraulic models were checked. The population table “SWC_Future_Population” (dated 26 February 2024) and SW hydraulic model (run code “WC04”) was checked. No additional model update was undertaken by GHD. Table 12 summaries the finding of the analysis.

Table 12 SWC_Future_Population table check

	Year 2023	Year 2026	Year 2028	Year 2031
Residential population (EP)	111,660	123,895	131,799	143,654
Number of Jobs	62,066	62,829	63,491	64,485
Job Number (converted to EP)	13,965	14,136	14,285	14,509
Total West Camden Catchment EP	**125,625**	**138,032**	**146,084**	**158,163**

5.2.2.1 Hydraulic Model Check for Run Code “WC04”

SW previously modelled run code “WC04”. The model reports a population of 139,821 EP in Year 2028/31. The total flow reported by the model is 24,626 kL/day, this equates to an EP of approximately 164,167 EP total in Year 2028/31. Figure 13 shows the sub catchment editor summary extracted from the model.

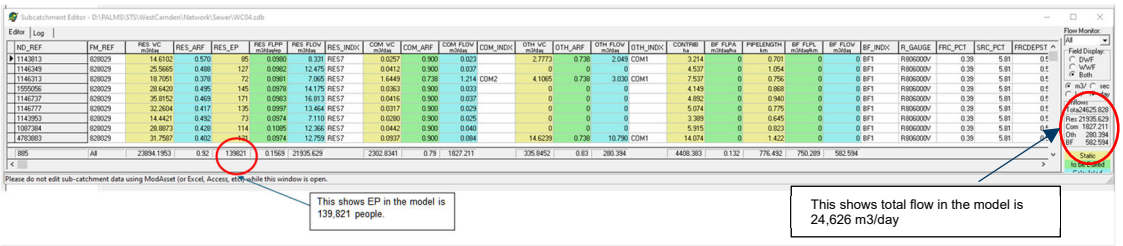

Figure 13: WC04 subcatchment editor reported flows

SW advised in email dated 31 July 2024 that the West Camden inflow data (flow monitoring) indicates that current inflow is equivalent to 164,000 EP rather than that of around 138,000, and with planned growth to 2028 the load would be 186,000 EP, thereby exceeding the plant capacity. During the clarification meeting of 02 September 2024 SW undertook to request a recheck of the flow meter at the plant to confirm flow rates.

Further to the submission of the Assessment Report (Rev 0) dated 16 September 2024, Sydney Water advised in comments dated 09 October 2024, that “With careful review of flow monitor data, West Camden WRRF team has estimated that 23.1 MLD is a most realistic flow to be adopted for planning. This flow is equivalent to 154,000 EP.”

SW advised that 154,000 EP is the total existing EP (residential and job) loading to the West Camden WRRF. With the growth estimate from 2024 to 2028 being 21,700 EP, loading to the West Camden WRRF by 2028 equates to about 176,000.

5.2.3 Growth in West Camden

Figure 14 presents infill growth sites in yellow and greenfield sites in green based on SW growth data. The majority of the growth in the West Camden catchment appears to be allocated as infill. If this infill growth projection does not eventuate then it may be possible for SW to reallocate this proposed type of growth to the development for the short period of 1 - 2 years until the long term servicing strategy is implemented.

The viability of this will be subject to hydraulic network modelling to determine the extent of network augmentation/s that may be required.

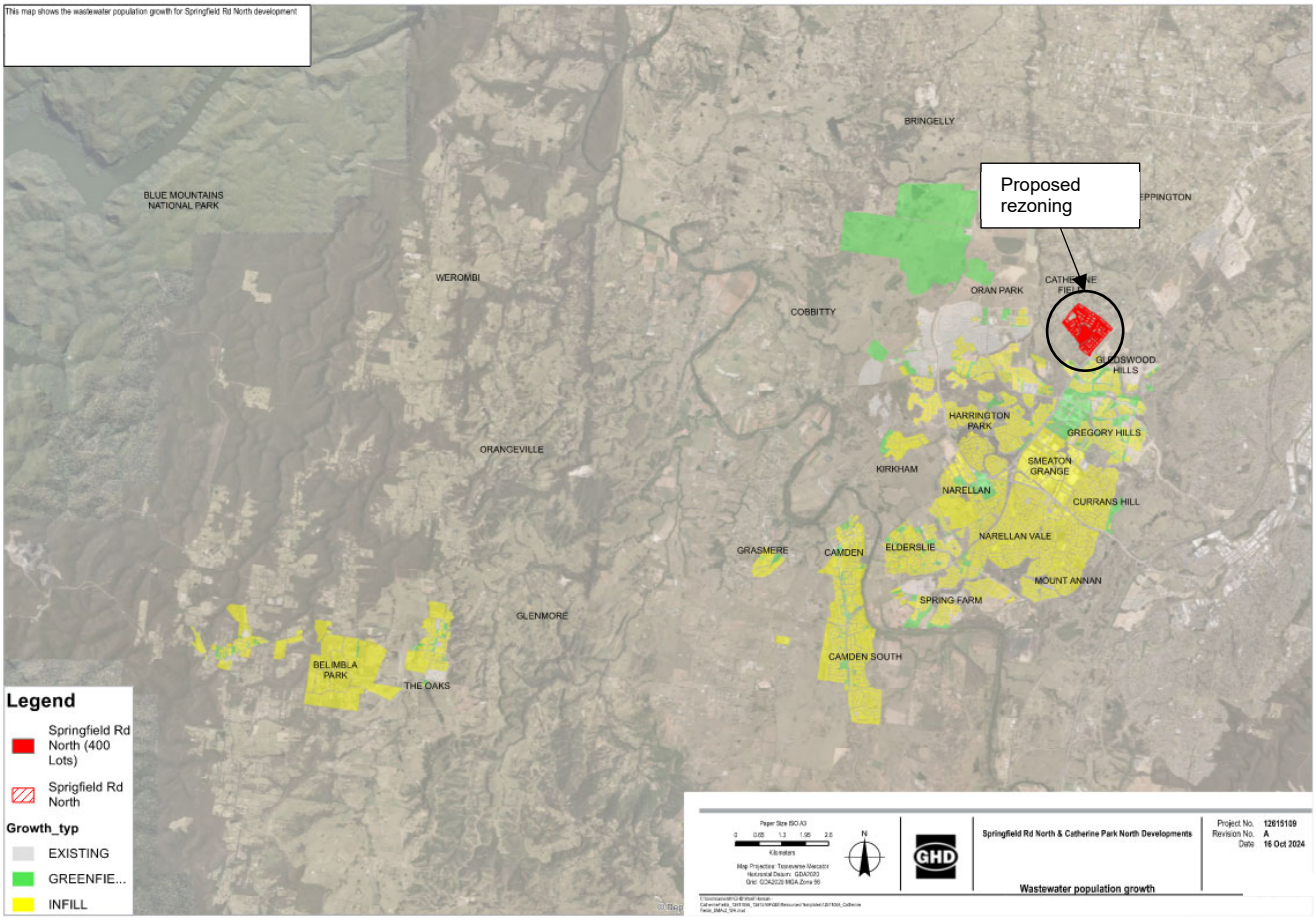

Figure 14 ***Population growth type by suburb***

6. Drinking water servicing options

6.1 Long term

As detailed in section 3.2, SW is planning to undertake an extensive program of works for the northern end of the Macarthur System under the GMAC program of works, with the intent of this work to relieve the existing capacity issues in the WSZs supplying the proposed development area.

In the long term it is expected that the Springfield Rd North will be connected to the SW drinking water network and supplied from the Leppington EI WSZ.

6.2 Interim

There are several interim servicing options being considered in consultation with SW for servicing of the initial 400 residential lots, as detailed in the following sections.

6.2.1 Connect to existing SW network

If permitted, the proposed development would connect to the existing DN150[12] located along Springfield Road which is within the Leppington EI WSZ.

SW advised proposed growth for the Catherine Fields precinct has been included for the options assessment in the GMAC study and trunk network upgrades are planned to be delivered by 2031. SW also advised that there is no capacity for the proposed development to connect to the existing SW network before 2031 without additional modelling to confirm staging and timing of when deficiencies may first become evident.

Further hydraulic modelling of the staging around the 2-3 years of timing when this development is requesting servicing is required to confirm the nature and extent of system upgrades if these are necessary prior to 2031.

6.2.2 Temporary connection to another WSZ

SW have advised that connection to the Oran Park WSZ may be possible to supply the development. It appears a 219 mm water pipe right is located approximately 1,000 m (via Springfield Rd and Luke's Ln) from the proposed development (refer to Figure 15).

Other connections that could be considered would be to the Currans Hill WSZ and/or Narellan South WSZ. The connection to the Currans Hill WSZ would require an extension of the DN250 watermain along the 'Hermitage Way' to the intersection of Springfield Road (approximately 290 m). While the connection to the Narellan South WSZ would require the extension of the DN200 watermain from Catherine Park Drive to the intersection of Springfield Road (approximately 620 m).

If the option of connecting to the existing SW network (section 6.2.1) is not feasible these options could be investigated further, including any hydraulic modelling required by SW to determine system capacity and the extent of network augmentation/s that may be required.

[12] Possible upsizing to DN200 of the Springfield Road main may be required to service the lot.

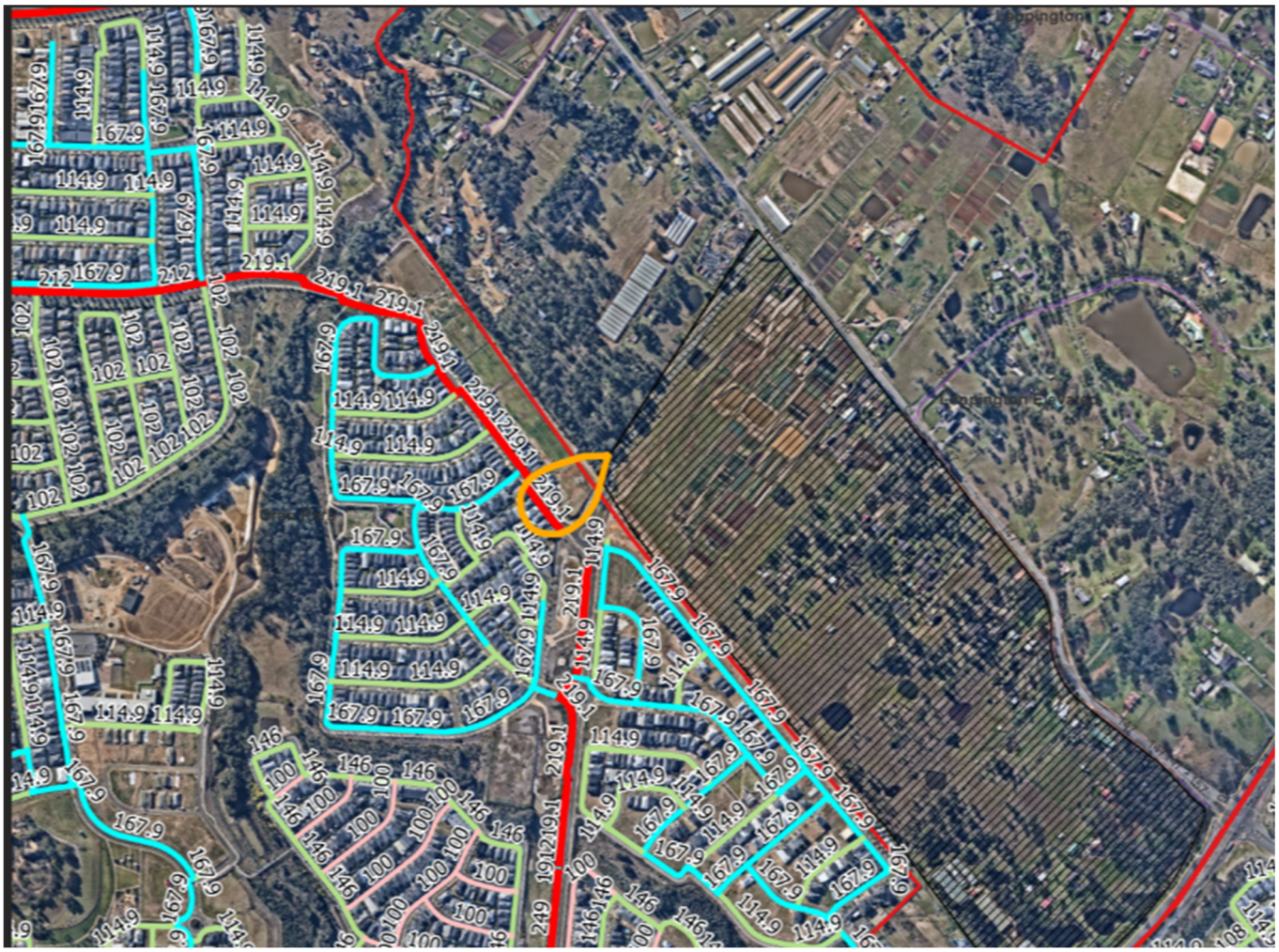

Figure 15 Potential connection point to Oran Park Water Supply Zone

6.2.3 Temporary reservoir to allow off-peak filling

This would entail connecting the existing SW water network (via the DN150 Springfield Road mains) and filling the temporary reservoir off-peak.

SW advised that a temporary reservoir may be a viable option and the developer has indicated that they would fund the construction, operation and maintenance of the tank. However SW have confirmed in comments dated 9 October 2024 that although SW can offer water quality testing at cost, SW will not operate or maintain the tank and the tank would be required to be managed by the developer until the final servicing strategy for the area is in place.

The developer has advised that they do not consider ownership, operation and maintenance of a temporary tank feasible as they are not a drinking water service provider.

This is currently not considered a viable option, and would only be investigated further (including through hydraulic modelling) if the interim options discussed in sections 6.2.1 and 6.2.2 are determined not to be feasible.

7. Wastewater Servicing Options

As detailed in section 4.2, SW is planning to undertake a program of works for wastewater servicing of the area. Under the future system arrangement the development will form part of the Lowes Creek wastewater collection system, transferring for treatment at the new USC AWRC. It is understood that the USC AWRC is scheduled to be operational in 2026.

7.1 Long term

The Springfield Rd North development will flow northeast via the new Rileys Creek Rd carrier and new SPS to SP1244, and USC AWRC. The trunk infrastructure is scheduled to be operational:

– Permanent SP1244 early in Year 2029
– Rileys Creek Rd carriers and new SPS to SP1244 ≈ 2030/31.

The developer has indicated they are willing to work with SW to bring forward the delivery date of the Rileys Creek Carrier from the Springfield Rd North development site to SP1244 from around 2030/31 to the end of 2028 to coincide with the delivery date of SP1244. This would be the subject of separate discussions between the developer and SW. The principles of accelerating development works shall be as per Sydney Waters 'Growth Servicing Plan' and 'Precinct Acceleration Protocol Funding Guidelines for Application of Commercial Principles'.

7.2 Interim

There are several interim servicing options being considered in consultation with SW for servicing of the proposed development, as detailed in the following sections.

7.2.1 Connect to existing SW network

If permitted to connect, the proposed development (up to 400 lots) would connect to a carrier discharging to SP1156 via a developer delivered temporary package pump station and rising main of approximately 670 metres, ultimately flowing to West Camden WRRP. A temporary pumping station and rising main discharging to West Camden WRRP is also possible. This would require Sydney Water to advise of the WWTP capacity to confirm this is possible.

The viability of this will be subject to hydraulic network modelling to determine the extent of network augmentation/s that may be required.

7.2.2 Monitor infill growth

SW could monitor infill growth and if it is established that the growth is not occurring as predicted then consideration could be given to reallocating available capacity for the short period needed (the development only requires 231 kL/day for 1 – 2 years), with:

– Other parts of the West Camden catchment progressively being transferred to the USC AWRC once SP1244 is operational in early 2029; and/or
– Delivery date bought forward of the Rileys Creek Carrier from the Springfield Rd North development site to SP1244 from around 2030/31 to the end of 2028.

The viability of this will be subject to hydraulic network modelling to determine the extent of network augmentation/s that may be required.

7.2.3 Interim Operation Protocol (IOP) – tankering

This option would require transport of the wastewater produced by the development by a registered vehicle tanker to a treatment facility with appropriate retrieval infrastructure and capacity, in accordance with Sydney Waters IOP guidelines and policies. For the purposes of this initial assessment, this is assumed to be the Glenfield WRP some 18 km away.

This option is subject to an accepted IOP Report and confirmation that the discharge facility being able to accept the proposed discharges.

Based on the Section 73 Certificate Request being made in early 2027, wastewater services being required progressively from early 2028, and the cost estimates undertaken by Colliers / Craig & Rhodes (Water and Sewer Options Report, 2023), the costs associated with tankering until mid-2031 for 200 lots are estimated to be in the order of $6.2M. See Appendix D for cost estimates.

The actual number of lots which may be serviced by IOP will be subject to negotiations between the developer and SW, and acceptance of the IOP Report.

The developer has indicated that this is not a preferred option for the following reasons:

– Costs associated with this option are high;
– It is unlikely to cater for the interim servicing of more than 200 lots; and
– The potential risk that tankering would be required for longer if SW infrastructure is not operational, at a cost of around $0.5M/month.

7.2.4 Temporary connection to another catchment

This option would involve connection via a developer delivered temporary pump station and rising main to the nearby Glenfield / Malabar catchment 2.5 – 3km away.

Further work would be required to confirm if there is treatment capacity available at the Glenfield WRP, a suitable connection point, and hydraulic network modelling to determine extent of network augmentation/s that may be required.

It is expected that this would not be a feasible option for the developer as an interim solution due to complexity and cost associated with it, and potentially only being required for 1 – 2 years.

7.2.5 On-site treatment and disposal

This option was considered at a high level in the Water and Sewer Options Report (Colliers / Craig & Rhodes, June 2023). Costs and irrigation area was based on the following:

– Treatment via MBR plant utilising spray irrigation for disposal
  - Cost of $10,000 / lot for treatment, and required area of 0.03 – 0.035 ha/lot for disposal.

This would likely service the proposed development until the SW long-term strategy is operational, as follows:

– Up to 400 lots from Springfield Rd North development for up to 3.5 years (2028 -mid-2031);

Based on the above, the costs and irrigation area required are estimated to be:

– Around $4M for treatment
– Disposal area of 12 ha for 400 lots in the proposal development area.

Currently the Springfield Rd North developer has control over 13 ha of land, of which the whole area is proposed for the development of housing.

Colliers have also advised that surrounding landowners are fragmented and would be unlikely to be receptive to involvement in a treated sewerage service scheme.

8. Recommendations

A review has been completed for future and interim water and wastewater servicing for the proposed Springfield Rd North development. Based on the available information, GHD has identified the following:

8.1 Drinking water:

In the future the Springfield Rd North development will connect to the SW network and be supplied from the Leppington Elevated WSZ. It is understood that the trunk infrastructure and upgrades identified as part of the GMAC program of works are scheduled for progressive delivery from current date to around Year 2031.

There are several interim servicing options being considered in consultation with SW for servicing of the proposed development, including:

– Connection to the existing network:
  - SW have confirmed that GMAC has identified that the network requires upgrading by around 2031. To ensure levels of service are not impacted between 2026 and 2031 additional assessment is required to identify which assets are required to service the Catherine Fields area to ensure acceptable levels of service are sustained.
  - Additional assessment may be required to assess the impact of the planned growth in the Springfield Rd North development between 2026 – 2031 to confirm if the SW network can supply this proposed development. If the Springfield Rd North proposed development requires this additional assessment prior to SW undertaking the assessment, it is recommended that Springfield Rd Pty Ltd and SW agree on scope, timing and next steps.
  - W advised in comments dated 09 October 2024, that until the proponents can demonstrate rezoning controls that would eliminate risk to SW and Council, SW cannot endorse the Planning Proposal without the detailed options assessment being completed.
  - SW could consider this assessment and additional negotiations with Springfield Rd Pty Ltd as a criteria for support for an amended Planning Proposal response to Camden Council, with the detailed options assessment being progressed in parallel with the rezoning process and/or when the SW NOR is issued.
– Temporary connection to another WSZ:
  - Connections to the Oran Park WSZ, Narellan South WSZ and/or Curran Hill WSZ may be possible to supply the development. If connection to the existing network deemed not feasible these options could be investigated further, including any hydraulic modelling to determine system capacity if required by SW.
  - SW advised in comments dated 09 October 2024, that until the proponents can demonstrate rezoning controls that would eliminate risk to SW and Council, SW cannot endorse the Planning Proposal without the detailed options assessment being completed.
  - SW could consider this assessment and additional negotiations with Springfield Rd Pty Ltd as a criteria for support for an amended Planning Proposal response to Camden Council, with the detailed options assessment being progressed in parallel with the rezoning process and/or when the SW NOR is issued.

8.2 Wastewater:

In the future the Springfield Rd North development will flow to the north east via Rileys Creek Carrier and new SPS and SP1244 to the USC AWRC for treatment. It is understood that trunk infrastructure for this long-term servicing strategy is scheduled to be operational early in Year 2029 (SP1244) and 2030/31 for the Rileys Creek carrier and new SPS.

The developer has indicated they are willing to work with SW to bring forward the delivery date of the Rileys Creek Carrier from the Springfield Rd North development site to SP1244 from around 2030/31 to the end of 2028 to coincide with the delivery date of SP1244. This would be the subject of separate discussions between the

developer and SW. The principles of accelerating development works shall be as per Sydney Waters 'Growth Servicing Plan' and 'Precinct Acceleration Protocol Funding Guidelines for Application of Commercial Principles'.

There are several interim servicing options being considered in consultation with SW for servicing of the proposed development, including:

– Connect to existing SW network
  - If permitted to connect, the proposed development (up to 400 lots) would connect to a carrier discharging to SP1156 via a developer delivered temporary pumping station and rising main of approximately 670 m, ultimately flowing to West Camden WRRP. This would require Sydney Water to advise of the WWTP capacity to confirm this is possible.
  - It is understood that the upgraded capacity of the West Camden WRRP will be 176,000 EP (scheduled to be operational in 2025). Based upon GHD's assessment of information from SW models and demand estimated the current connected population is around 138,000 EP.
  - SW provided updated advice in comments dated 09 October 2024, that with careful review of flow monitor data, West Camden WRRF team has estimated that 154,000 EP is the most realistic current flow to be adopted for planning.
    – As there is still a discrepancy between the monitored flow to the West Camden WRRP and the demand assessment presented in the BoP, it is recommended that further investigations be undertaken by SW to understand the reason for the discrepancy.
  - Subject to resolving the anomaly noted above, further assessment may be required to confirm options to service the Springfield Rd North development.
  - SW advised in comments dated 09 October 2024, that until the proponents can demonstrate rezoning controls that would eliminate risk to SW and Council, SW cannot endorse the Planning Proposal without the detailed options assessment being completed.
  - SW could consider this assessment and additional negotiations with Springfield Rd Pty Ltd as a criteria for support for an amended Planning Proposal response to Camden Council, with the detailed options assessment being progressed in parallel with the rezoning process and/or when the SW NOR is issued.
– Monitor infill growth
  - SW could monitor infill growth for the West Camden WRRP catchment and if it is established that the growth is not occurring as predicted then consideration could be given to reallocating available capacity to service the Springfield Rd North development for 1 – 2 years.
  - SW advised in comments dated 09 October 2024, that until the proponents can demonstrate rezoning controls that would eliminate risk to SW and Council, SW cannot endorse the Planning Proposal without the detailed options assessment being completed.
  - SW could consider this assessment and additional negotiations with Springfield Rd Pty Ltd as a criteria for support for an amended Planning Proposal response to Camden Council, with the detailed options assessment being progressed in parallel with the rezoning process and/or when the SW NOR is issued.

8.3 Summary

SW could consider this Assessment Report, and additional negotiations as needed by SW with Springfield Rd Pty Ltd, as a criteria for support for an amended Planning Proposal response to Camden Council, with the detailed options assessment being progressed in parallel with the rezoning process and/or when the SW NOR is issued.

The above is subject to the SW requirement that the proponents demonstrate rezoning controls that would eliminate risk to SW and Council, prior to SW endorsing the Planning Proposal without the detailed options assessment being completed.

Appendices

Appendix A

Water Basis of Planning for Catherine Fields rezoning areas

Appendix B

Wastewater Basis of Planning for Catherine Fields rezoning areas

Appendix C

West Camden Water Recycling Plant Upgrade

Appendix D

IOP cost estimates

ghd.com

→ The Power of Commitment