



ALDA | ROSE | URBAN VILLAGER

Sewer Capacity Assessment Report

285-335 Pacific Highway, Lake Munmorah

29 July 2022

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1	For Approval	18/5/2022	Planning Proposal
2	For Approval	29/07/2022	Amended calculations to HWC per Council comment

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1 Executive Summary

Barker Ryan Stewart has been engaged by ALDA/Rose/Urban Villager to prepare a Sewer Capacity Assessment Report in accordance with the requirements of Central Coast Council.

As part of a Planning Proposal, it is proposed to rezone land at 285-335 Pacific Highway, Lake Munmorah to facilitate future residential development of the site. Preliminary lot yield for the site is approximately 300 lots.

This report has been prepared to support a Planning Proposal for rezoning of the land. The report assesses the ability of the existing sewerage network to accept the anticipated additional sewer loading from the future residential development and has been prepared in accordance with the requirements of Central Coast Council.

Details of the existing sewerage network were extracted from Council provided Work-As-Constructed drawings and GIS information.

Theoretical wastewater flow rates for existing and developed conditions were estimated using the method detailed in the Sewerage Code of Australia (WSA02) Hunter Water Edition Version 2.

Staging of the development cannot be determined at the Planning Proposal stage. This report has therefore been prepared to assess the ultimate, full development of the site.

A sewer hydraulic capacity assessment of the gravity network was carried out using DRAINS software with consideration of the calculated wastewater flow rates, Council work-as-constructed drawings and Council GIS information.

The hydraulic model results demonstrate that the existing gravity sewerage network between the development site and the receiving SPS has suitable capacity to convey developed condition flows without liquid spilling at the surface.

Accordingly, upgrade or augmentation of Council's existing gravity sewerage network is not considered necessary to accommodate the proposed development.

Capacity of the downstream sewerage network beyond the gravity network assessed in this report has been reviewed in Council's *'Northern Region Water Supply and Sewerage Development Servicing Plan 2019'* (known as the DSP). This report does not identify any potential upgrades to the receiving SPS or SRM.

Further, Council's DSP identifies other development within the catchment that may trigger the need for network upgrades. Potential upgrades will need to be undertaken at the next stage of the design (after Planning Proposal approval) in conjunction with Central Coast Council and with consideration to any other potential development within the catchment.

The concept subdivision layout plan prepared for the Planning Proposal is indicative. Final layout and lot configuration is subject to further development as part of the next stage of the design, after Planning Proposal approval. Any future alterations to the subdivision layout are not expected to significantly alter the proposed sewer loading or outcomes of this report.

A gravity sewerage network will be required to service the proposed development. The network layout will be developed in future stages of the development's design, after approval of the Planning Proposal.

2 Site Details

2.1 Existing Site and Location

The subject land is in Lake Munmorah within the Central Coast Council local government area. The property addresses are 285-305, 315, 325 and 335 Pacific Highway, Lake Munmorah and include the following lots:

- a. Lot 1 DP 626787
- b. Lot 2 DP 626787
- c. Lot 437 DP 755266
- d. Lot 438 DP 755266
- e. Lot 27 DP 755266
- f. Lot 12 DP 771284
- g. Lot 83 DP 650114

The total area of the subject sites is approximately 27.2 ha.

Existing improvements to the sites comprising 285-305 Pacific Highway include a commercial boarding kennel facility, three rural residential dwellings and associated outbuildings as shown in Figure 2.

Existing improvements to the sites comprising 315-335 Pacific Highway include one residential property, two commercial buildings and a BP Service Station. These three sites also include associated outbuildings and car parking.

The site includes a natural ridge that approximately follows the boundary of Lot 1 and Lot 438. This divides the site into an Eastern and Western catchment that discharge to separate branches of the existing sewerage network. The site generally falls from north to south.

A site locality plan and site aerial image are presented in Figure 1 and Figure 2, respectively.

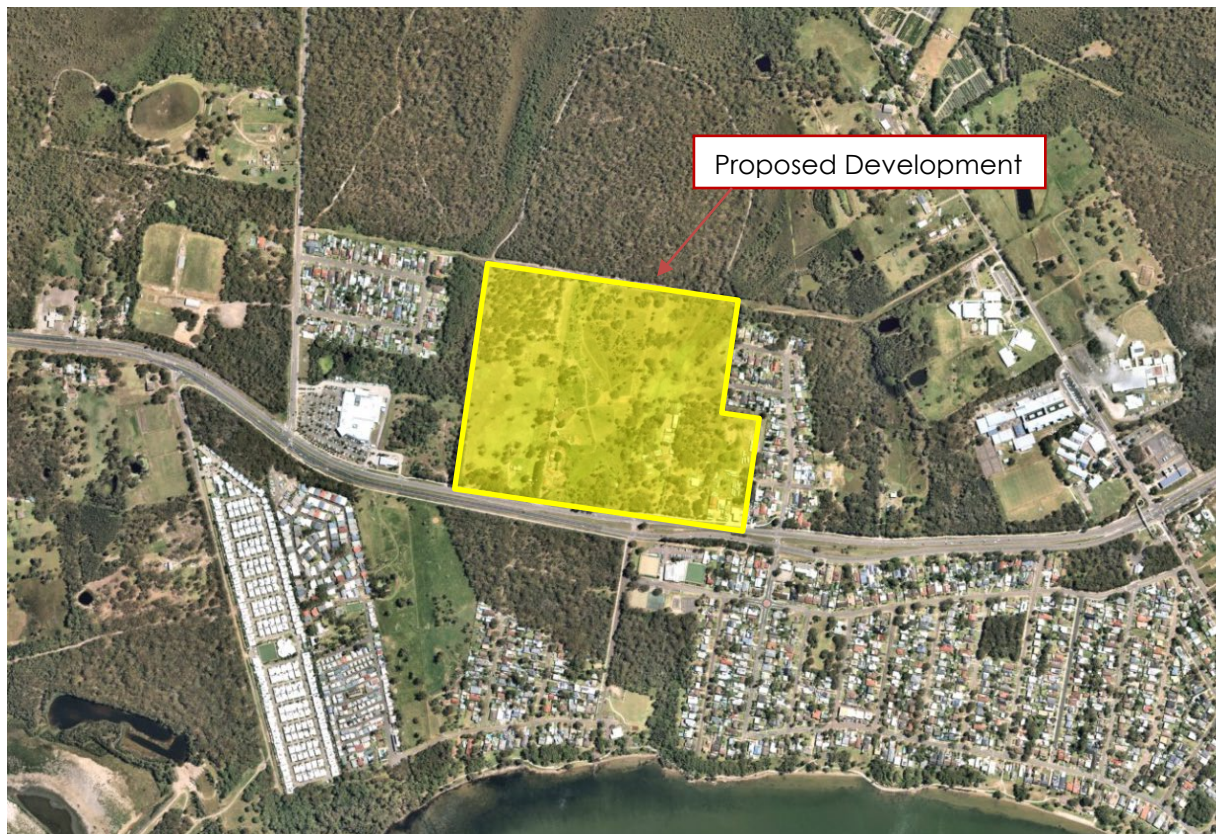


Figure 1 – Locality Plan (via NearMaps)



Figure 2 – Site Aerial Image (via Sixmaps)

2.2 Proposed Development

The planning proposal involves the rezoning of land at 285-335 Pacific Highway, Lake Munmorah to permit a residential development. The proposal is likely to yield in the order of 300 residential lots. Primary vehicular access is proposed from the west and east via existing access points from the Pacific Highway. Potential staging of the development will be considered as part of future design stages (i.e. following Planning Proposal approval).

The site's Concept Master Plan was prepared by Peter Andrews and Associates with consideration to the recommendations of the Biodiversity Certification Assessment report and preliminary stormwater assessment. The Concept Master Plan is presented in Figure 3.

It is noted that the layout is indicative only and has been prepared to demonstrate the feasibility of the Planning Proposal. Final layout and lot configuration and yield is subject to further development as part of the next stage of the design after Planning Proposal approval.



Figure 3 – Concept Site Master Plan

3 Study Requirements

Requirements for the Sewer Capacity Assessment were received from Central Coast Council via email on 1 September 2021 and are presented below:

- a. The developer will be required to provide detail W&S servicing strategy just for the subject application area. The strategy will need to include but not limited to the following:
 - i. The staging of the development
 - ii. Estimated timeframe of each stage
 - iii. Concept design of the subdivision plan
- b. The strategy will identify any sewer system capacity constraint and identify any required upgrades to accommodate the proposed rezoning.
- c. W&S in-house sewer modelling data can be made available to assist the preparation of the strategy upon request from the proponent.

This Report has been prepared to generally address the above requirements noting:

- a. Staging of the development cannot be determined at the Planning Proposal stage. This report has therefore been prepared to assess the ultimate, full development of the site.
- b. Concept design of the subdivision plan is presented in Figure 3. It is noted that the layout is indicative only and has been prepared to demonstrate the feasibility of the Planning Proposal. Final layout and lot configuration and yield is subject to further development as part of the next stage of the design after Planning Proposal approval. Any future alterations to the subdivision layout are not expected to significantly alter the proposed sewer loading or outcomes of this report.

4 Assessment Methodology

The assessment methodology comprised:

1. Evaluation of existing gravity arrangement based on network information supplied in 'GIS' format by Council.

The network information supplied by Council included:

- o Manhole locations for the Lake Munmorah township on MGA (Zone 56) Projection (GDA94), including invert and surface levels.
 - o Gravity sewerage and sewer rising main pipe arrangement including size and materials.
2. Supplementing Council's GIS network with Council provided Work-As-Constructed (WAC) drawings for the gravity sewer networks downstream of the development site.
 3. Calculation of theoretical wastewater loadings within the relevant gravity sewer lines based for 'existing' and 'proposed' conditions.

Loadings were calculated using the Sewerage Code of Australia (WSA02) Hunter Water Edition Version 2. Refer to Appendix B and Appendix C for design flows.

4. Review of the theoretical wastewater loadings with Council supplied pump station data at Lloyd Avenue (SPS MP12).
5. Preparation of a hydraulic model for relevant gravity pipe segments downstream of the development site using DRAINS software package and Council-supplied network data (GIS and WAC).
6. Running the DRAINS network hydraulic model for the gravity network using the theoretical flow estimates. The model was run for 'existing' and 'proposed' wastewater flow rates.
7. Analysis of Model Results
The estimated liquid levels in each manhole were compared for existing and proposed conditions, to evaluate whether the loadings from the proposed development can be accommodated.

5 Network Arrangement and Flows

5.1 Existing Sewerage Network

Council's existing sewerage network is shown on Drawing series CC180099-05 included in Appendix A. This drawing set shows estimated sewer catchments used for the assessment.

The existing sewerage lines relevant to the development site are highlighted and detailed on Drawing series CC180099-05 included in Appendix A.

Figure 4 presents a high-level overview of the existing network as it relates to the development site.

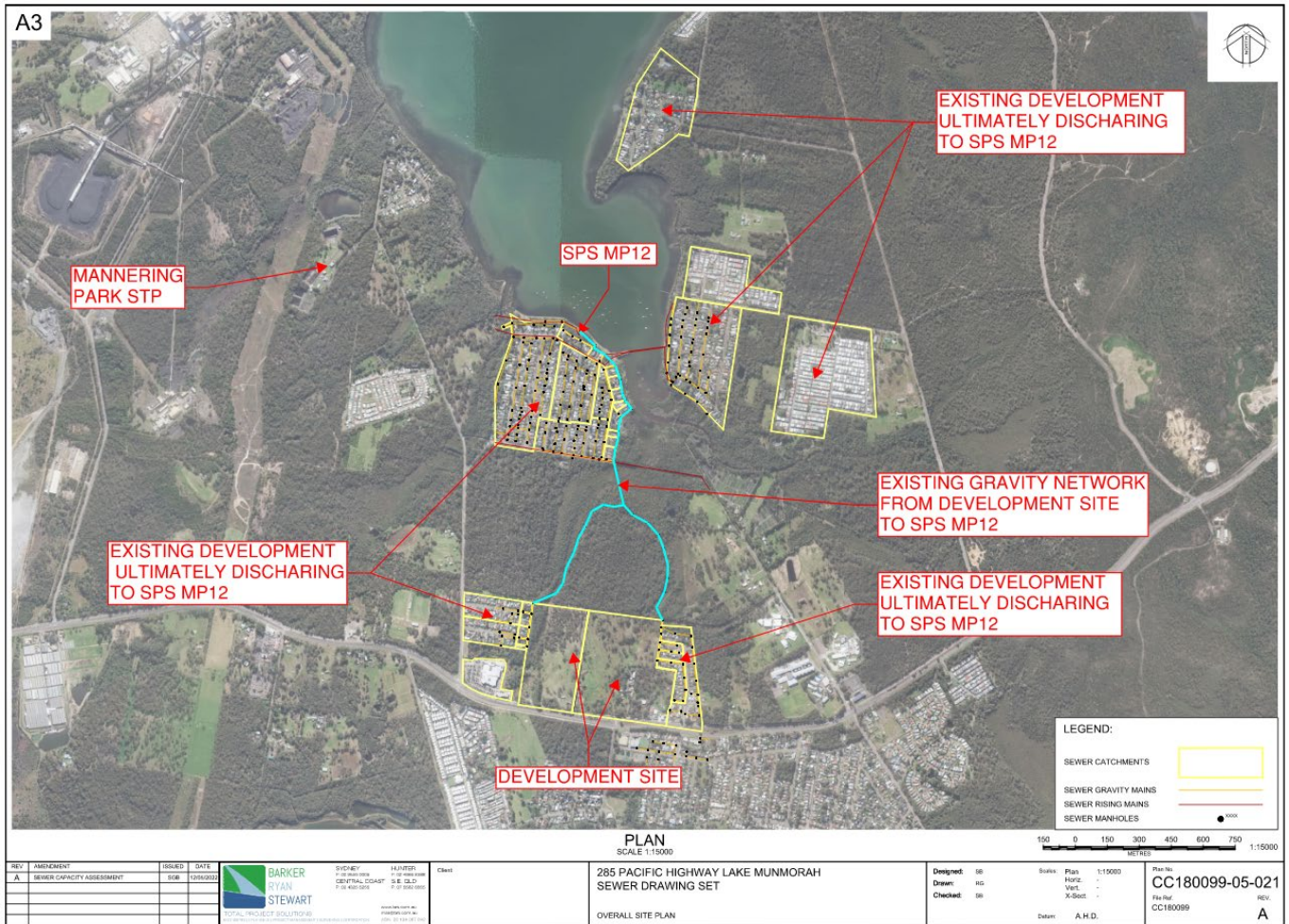


Figure 4 – Existing Sewerage Network

5.2 Theoretical Wastewater Loadings

Theoretical wastewater loading calculations were prepared for the site under existing and developed conditions. Additional calculations were undertaken for the upstream and downstream gravity network as they impact discharge from the development site to the receiving sewerage pump station.

Wastewater loading calculations were undertaken in accordance with the requirements of Sewerage Code of Australia (WSA02) Hunter Water Edition Version 2.

Key assumptions in the upstream loading assessment are presented in Table 4.1.

Table 4.1: Key assumptions and adopted parameter values for theoretical flow calculations

Parameter	Assumption/Value
Wastewater Generation	950 Litres / ET / Day
ET Density (Residential)	1 ET per standard residential dwelling
ET Density (Commercial)	Varies 5ET/ha to 50ET/ha depending on types of development in each location
EP	3.5EP/ET
Groundwater Factor	0.5 (only half pipework assumed above the permanent groundwater level)
Storm Allowance (L/s)	0.058L/s per ET (residential) 0.58L/s per hectare (commercial)
ADWF	0.011L/s per ET

5.2.1 Existing Site Loading

With reference to site survey, the existing site has the following areas and estimated sewer load:

- Commercial boarding kennel facility = 0.5ha x 10ET/ha = 5ET
- 3 rural residential dwellings = 3 lots x 1ET/lot = 3 ET
- 2 commercial buildings = 0.2ha x 2ET/ha = 2 ET
- BP Service Station = 0.3ha x 3ET/ha = 3 ET

The existing site has a total loading of 13 ET.

5.2.2 Developed Site Loading

The proposed residential development would provide 300 residential low density lots

With reference to WSA02 and the above, the potential maximum development loading is:

- 300 Residential lots = 300 lots x 1 ET/lot = 300 ET

It is therefore estimated that the proposed development will increase the load to Council's sewerage network by 287 ET.

The development site is assumed to connect into the following structures:

- SMH BM10, located in the south-west of the site. Assumed loading is 100 lots (100 ET)
- SMH BL11, located in the south-east of the site. Assumed loading is 200 lots (200 ET)

The above lot split is based upon the existing topography. Minor variations to the above split may occur but this is not expected to significantly alter the assessment or recommendations of this report.

5.2.3 Adjoining Network Loading

An assessment of loading from the adjoining sewerage network was undertaken for the existing gravity networks from the development site to SPS MP12 as presented in Figure 4.

Catchment areas for the sewerage network are shown on Drawing series CC180099-05 included in Appendix A.

The adjoining network loading calculations were applied to the existing condition and developed condition assessment.

Based upon the calculations presented in Appendix B, estimated peak flows arriving at SPS MP12 are presented below.

Table 4.2: Estimated peak flow rates arriving at existing SPS MP12

Development Condition	Total Area	Total ET	Design Flow (PWWF)
Existing Condition	128.5 ha	1262 ET	128 L/s
Developed Condition	128.5 ha	1549 EP	154 L/s

5.3 Comparison of Flow Rates (Existing vs Proposed)

The comparison the data in Table 4.2 shows that due to the development:

- The is no change to the total catchment area to SPS MP12.
- There is a net increase of 287 ET.
- There is a net increase of 26 L/s design flow (PWWF).

5.4 SPS MP12 Pump Station Data

As part of an earlier study of the site, SPS MP12 information was provided by Council on 26/2/2019. The provided information included a theoretical PWWF simulation. Email correspondence from Council dated 13/12/2022 confirmed that the previous advice dated 26/2/2019 may still be relied upon.

Figure 5 presents a theoretical PWWF simulation from Council's ICM model that shows discharge flow through the DN300 rising main leading out of SPS MP12.

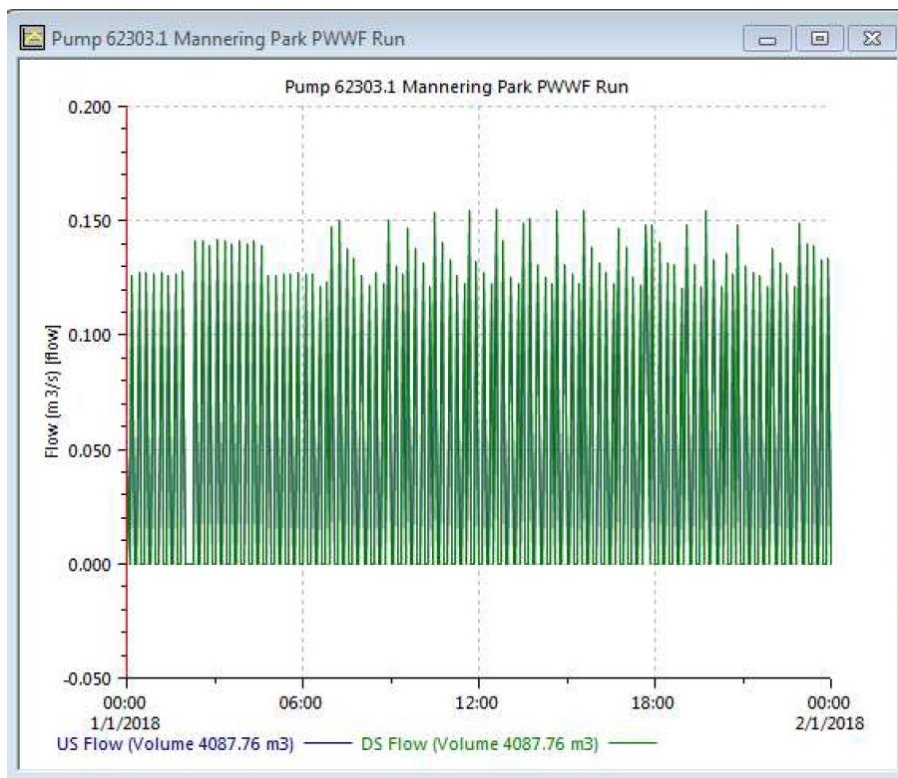


Figure 5 – Council Theoretical PWWF Simulation Showing Flow Rate From SPS MP12

The above figure shows peak flow is approximately 155L/s. This shows a reasonable correlation with the estimated existing condition PWWF of 125L/s as presented in Table 4.2.

5.5 Central Coast Council Developer Servicing Plan 2019

Central Coast Council has prepared a report titled 'Northern Region Water Supply and Sewerage Development Servicing Plan 2019, Version 2.0, October 2019'. This report, known as the DSP, identifies strategic upgrades to the existing sewerage network to cater for planned, future development.

A review of the DSP report was undertaken to identify proposed upgrades to the sewerage network in the vicinity of the development site.

5.5.1 Identified Future Development Areas

Figure 3, Plan 3 and Plan 4 of the DSP show a number of proposed developments in the vicinity of the subject site. A number of the proposed developments, including the subject site, discharge to existing SPS MP12.

5.5.2 Proposed Gravity Sewer Network Upgrades

Figure 3, Plan 3 of the DSP show a number of proposed gravity sewer network upgrades, including a number to service the subject site. Such upgrades include:

- a. Proposed DN150 gravity mains to service the subject site near the eastern and western boundary;
- b. Upgrade the existing DN225 eastern line (Line 4 MP12) to DN300;
- c. Upgrade existing Line 1 MP12 to a DN300 or greater main downstream of our site.

Assessment of the existing gravity sewerage network is presented in Section 6 of this report and shows that the proposed gravity main upgrades identified above are not warranted by the subject site's

development. It is acknowledged that other development within the catchment of SPS MP12 may trigger the need for the identified gravity network upgrades.

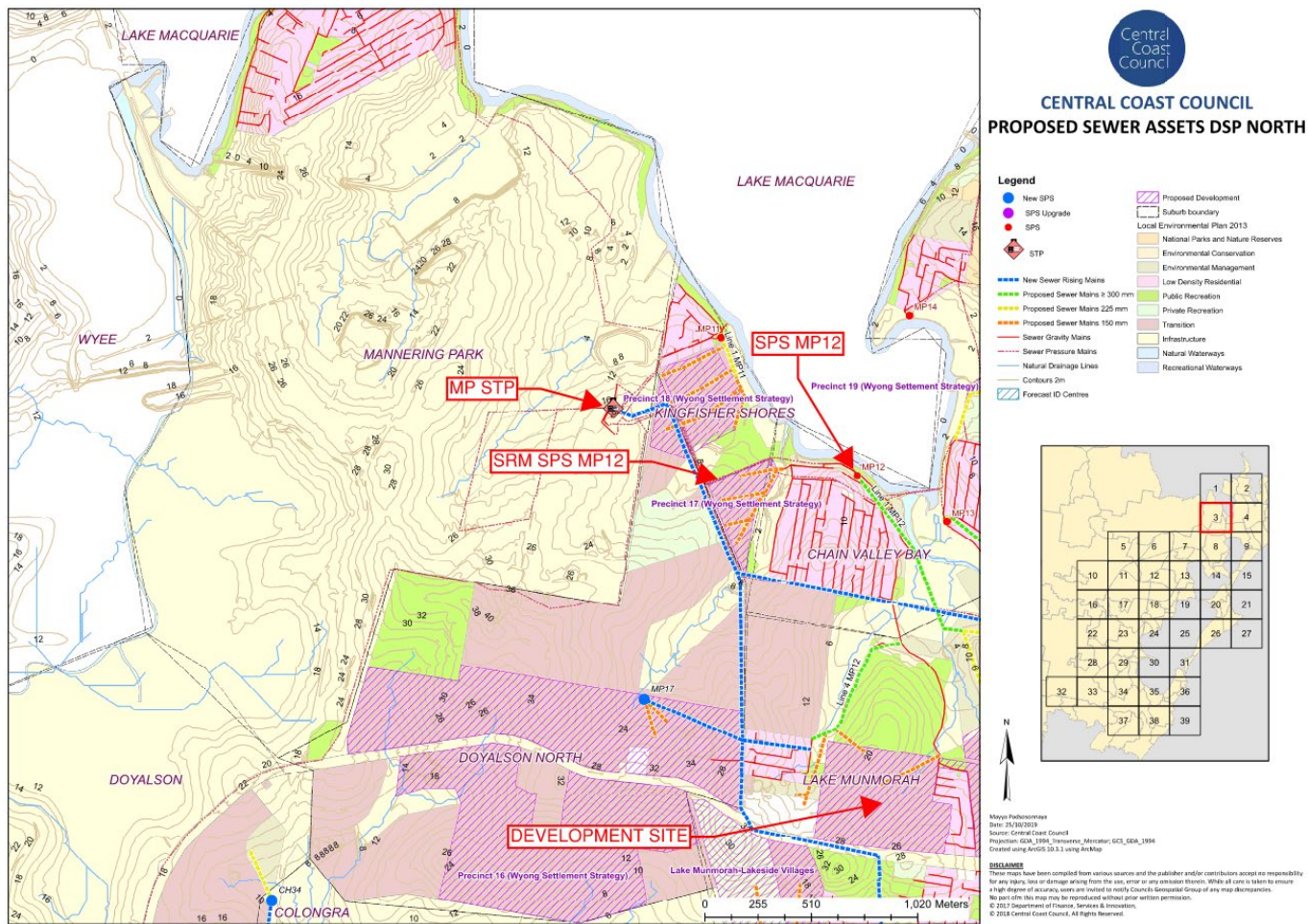


Figure 6 – Proposed Sewer Assets DSP North (Figure 3, Plan 3 from Council DSP)

5.5.3 Proposed SPS and SRM Upgrades

A review of the DSP, Appendix E, Sewerage Capital Works Summary shows:

- Allowance to upgrade Line 1 and Line 4 as described in Section 5.5.2 above;
- No allowance to upgrade the receiving SPS (SPS MP12);
- No allowance to upgrade the SPS SRM (SRM SP12).

On the basis of the above it is considered that the receiving SPS and SRM have been assessed in the DSP as not requiring upgrade.

Further investigations to confirm the suitability of the existing SPS and SRM to accept the proposed sewage loading from the subject site and adjoining development may be required and should be discussed with Council at the next stage of the design.

5.5.4 Proposed STP Upgrades

The Central Coast Council operated Manning Park Sewage Treatment Plan (MP STP) is located off Tall Timbers Drive, approximately 1.2km from SPS MP12.

A review of the DSP, Appendix F, 2014 SKM Sewerage Network Analysis, Table 2, shows that the receiving Mannering Park STP (MP STP) has:

- a. Current capacity of 5,000ET;
- b. Planned Future Capacity of 5,000ET (i.e. no increase from existing);
- c. 2013 loading of 4,745ET with spare capacity of 255ET;
- d. 2031 loading of 5,997ET with capacity deficit of 997ET;
- e. 2043 loading of 7,839ET with capacity deficit of 2,839ET;

A review of the DSP, Appendix E, Sewerage Capital Works Summary shows that no allowance has been made for potential upgrades to the MP STP.

5.6 Further Assessment of Possible Future Upgrades

Further assessment of possible future upgrades will be required at the next stage of the design (after Planning Proposal approval).

Potential upgrades may include:

- a. Gravity main upgrades;
- b. SPS upgrades and associated SRM upgrades;
- c. STP upgrades.

The assessment should be undertaken in conjunction with Central Coast Council and with consideration to expected development timing of other potential development within the catchment.

6 Gravity Network Modelling

6.1 Model Configuration

With consideration to the theoretical wastewater loading calculations undertaken as described in Section 5.2 of this report, hydraulic models were prepared to assess liquid levels within the existing gravity sewerage network between the development site and SPS MP12.

Two hydraulic models were prepared:

- a. Existing condition: To assess the performance of the existing network under existing loads.
- b. Developed condition: To assess the performance of the existing network under proposed loads and identify any areas where network upgrades may be required.

The hydraulic models were prepared in DRAINS software (Version 2021.031). Data entered into the model comprised:

- a. SMH levels based upon Council WAC drawings and supplemented with Council GIS data as required.
- b. Sewer pipe sizes, length and invert levels based upon Council WAC drawings and supplemented with Council GIS data as required.
- c. Existing condition and developed condition flows based upon the calculations discussed in Section 5.2 of this report and presented in Appendix B.

Figure 6 presents a screen capture of the hydraulic model configuration.

With reference to the Figure 7:

- a. SMH structure names are presented in **black**.
- b. Sewer pipe diameters are presented in **magenta**.

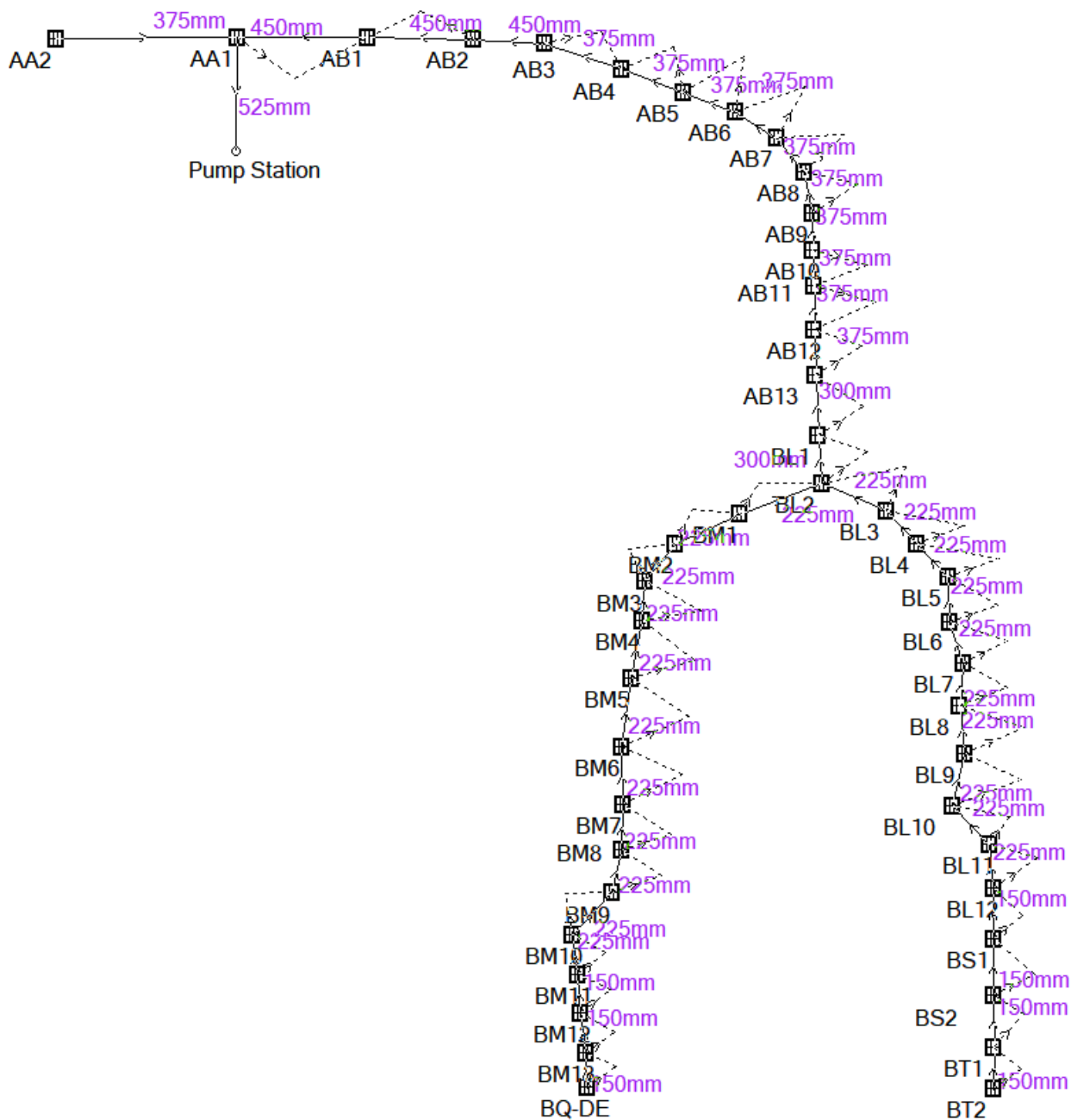


Figure 7 – Hydraulic Model Configuration

6.2 Existing Condition Results

Hydraulic results for the theoretical existing condition PWWF as discussed in Section 5.2 of this report are presented in Figure 8.

With reference to the figure below:

- a. Pipe flows are presented in **blue** in m³/s.
- b. Spill flows (ie those that exceed pipe capacity and reach the surface) are shown in **red** in m³/s.

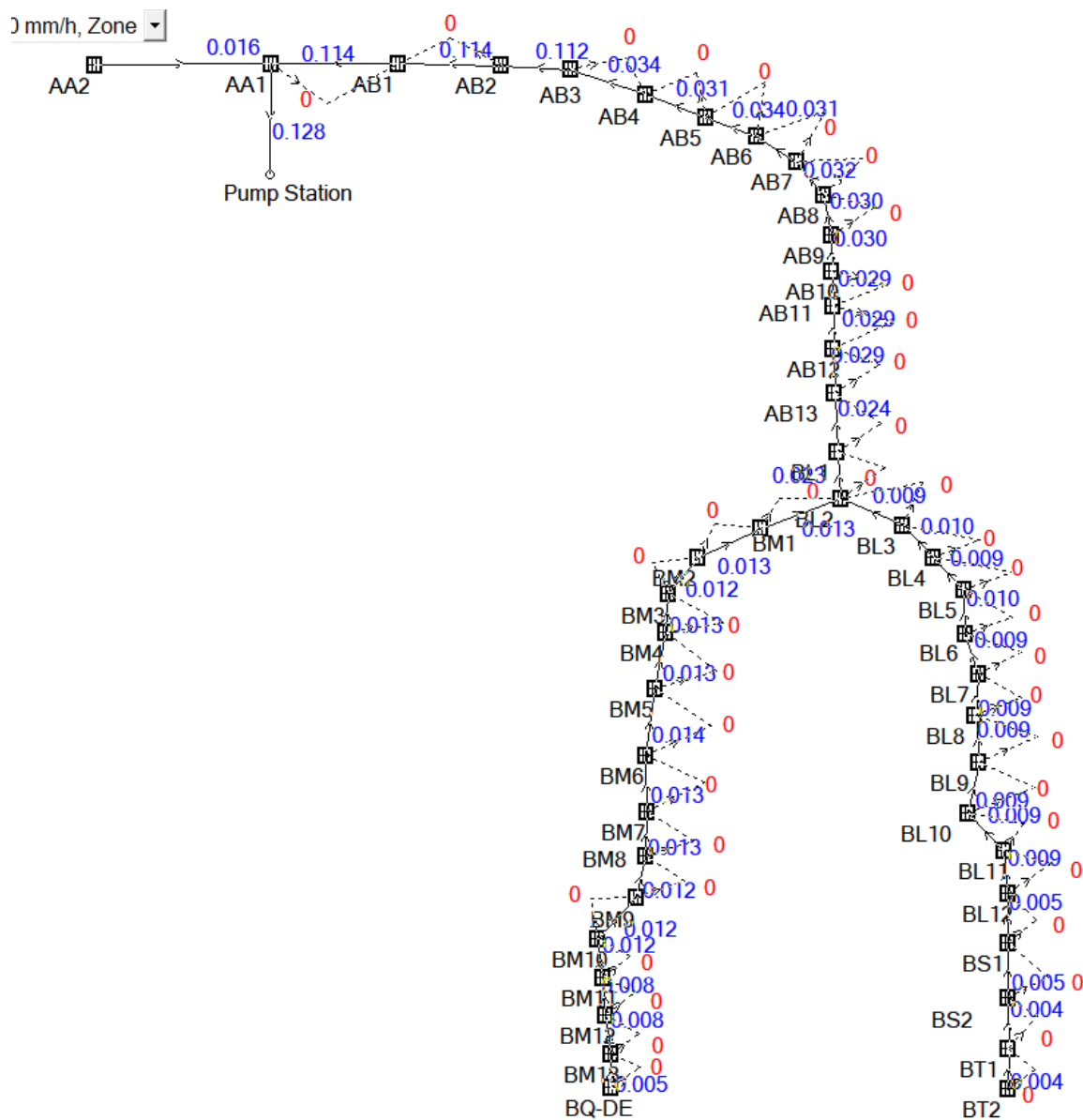


Figure 8 – Results of Hydraulic Model – Existing Condition

6.3 Developed Condition Results

Hydraulic results for the theoretical developed condition PWWF as discussed in Section 5.2 of this report are presented in Figure 9.

With reference to the figure below:

- a. Pipe flows are presented in **blue** in m³/s.
- b. Spill flows (ie those that exceed pipe capacity and reach the surface) are shown in **red** in m³/s.

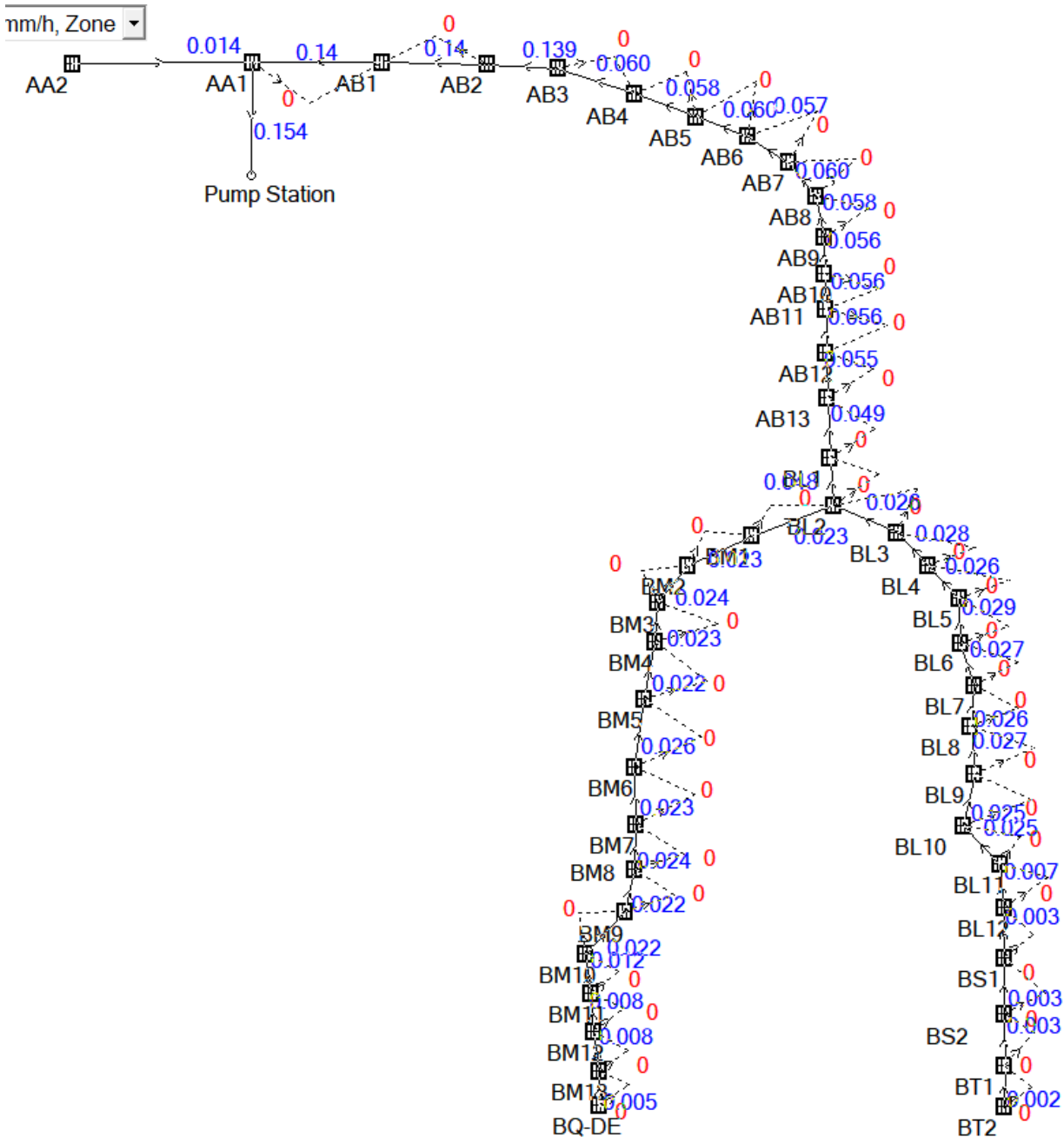


Figure 9 – Results of Hydraulic Model – Proposed Condition

6.4 Discussion of Results

Based on the hydraulic results presented in Section 6.2 and 6.3 above:

- a. The existing gravity network between the development site and SPS MP12 has suitable capacity to convey the theoretical existing condition PWWF of 128L/s without liquid rising to the surface.
- b. The existing gravity network between the development site and SPS MP12 has suitable capacity to convey the theoretical developed condition PWWF of 154L/s without liquid rising to the surface.

The hydraulic analysis has therefore confirmed that the existing gravity network is capable of conveying the calculated developed conditions flows without upgrade or augmentation.

6.4.1 Analysis Notes

It should be noted that the hydraulic analysis is considered conservative. Some key elements leading to the conservative outcomes include:

- a. Peaks from commercial / industrial land uses often do not coincide with peaks from residential land use. Regardless, this assessment has assumed all areas contribute their peak flows at the same time.

7 Conclusion and Recommendations

As part of a Planning Proposal, it is proposed to rezone land at 285-335 Pacific Highway, Lake Munmorah to facilitate future residential development of the site. Preliminary lot yield for the site is approximately 300 lots.

This report assesses the ability of the existing sewerage network to accept the anticipated additional sewer loading from the future residential development and has been prepared in accordance with the requirements of Central Coast Council.

Theoretical wastewater flow rates for existing and developed conditions were estimated using the method detailed in the Sewerage Code of Australia (WSA02) Hunter Water Edition Version 2.

A hydraulic capacity assessment of the gravity sewerage network was carried out using DRAINS software with consideration the calculated wastewater flow rates, Council work-as-constructed drawings and Council GIS information.

Staging of the development cannot be determined at the Planning Proposal stage. This report has therefore been prepared to assess the ultimate, full development of the site.

The hydraulic model results demonstrate that the existing gravity sewerage network between the development site and the receiving SPS has suitable capacity to convey developed condition flows without liquid spilling at the surface.

Accordingly, upgrade or augmentation of Council's existing gravity sewerage network is not considered necessary to accommodate the proposed development.

Capacity of the downstream sewerage network beyond the gravity network assessed in this report has been reviewed in Council's '*Northern Region Water Supply and Sewerage Development Servicing Plan 2019*' (known as the DSP). This report does not identify any potential upgrades to the receiving SPS or SRM. While the report identifies STP capacity deficiencies in the year 2031, upgrades to the STP to increase capacity is not identified in the DSP.

Further, Council's DSP identifies other development within the catchment that may trigger the need for network upgrades. Potential upgrades will need to be undertaken at the next stage of the design (after Planning Proposal approval) in conjunction with Central Coast Council and with consideration to any other potential development within the catchment.

The concept subdivision layout plan prepared for the Planning Proposal is indicative. Final layout and lot configuration is subject to further development as part of the next stage of the design, after Planning Proposal approval. Any future alterations to the subdivision layout are not expected to significantly alter the proposed sewer loading or outcomes of this report.

Appendix A – Sewer Plans and Data



LEGEND:

- SEWER CATCHMENTS
- SEWER GRAVITY MAINS
- SEWER RISING MAINS
- SEWER MANHOLES xxxx



PLAN
SCALE 1:15000

REV	AMENDMENT	ISSUED	DATE
A	SEWER CAPACITY ASSESSMENT	SGB	12/05/2022



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**285 PACIFIC HIGHWAY LAKE MUNMORAH
SEWER DRAWING SET**

OVERALL SITE PLAN

Designed: SB
Drawn: RG
Checked: SB

Scales: Plan 1:15000
Horiz. -
Vert. -
X-Sept. -
Datum: A.H.D.

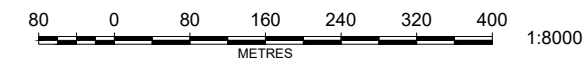
Plan No. **CC180099-05-021**
File Ref. CC180099
REV. **A**



LEGEND:

- SEWER CATCHMENTS
- SEWER GRAVITY MAINS
- SEWER RISING MAINS
- SEWER MANHOLES xxxx

PLAN
SCALE 1:8000



REV	AMENDMENT	ISSUED	DATE
A	SEWER CAPACITY ASSESSMENT	SGB	12/05/2022

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**285 PACIFIC HIGHWAY LAKE MUNMORAH
SEWER DRAWING SET**

SITE PLAN - NORTH

Designed:	SB	Scales:	Plan 1:8000
Drawn:	RG	Horiz.	-
Checked:	SB	Vert.	-
		X-Sect.	-
		Datum:	A.H.D.

Plan No.
CC180099-05-101

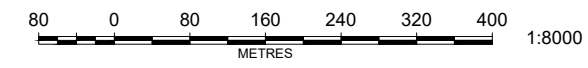
File Ref.
CC180099

REV.
A



LEGEND:

- SEWER CATCHMENTS
- SEWER GRAVITY MAINS
- SEWER RISING MAINS
- SEWER MANHOLES xxxx



PLAN
SCALE 1:8000

REV	AMENDMENT	ISSUED	DATE
A	SEWER CAPACITY ASSESSMENT	SGB	12/05/2022

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TOTAL PROJECT SOLUTIONS
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Client: 285 PACIFIC HIGHWAY LAKE MUNMORAH
SEWER DRAWING SET

SITE PLAN - SOUTH

Designed: SB
Drawn: RG
Checked: SB

Scales: Plan 1:8000
Horiz. -
Vert. -
X-Sect. -

Datum: A.H.D.

Plan No. **CC180099-05-102**
File Ref. CC180099
REV. **A**

Appendix B – Existing Condition Wastewater Loading Calculations

HUNTER WATER METHOD (EXISTING)

MH NUMBER	RESIDENTIAL ET	COMMERCIAL ET	ET	ADWF (L/s)	R TYPE	R	SA	PDWF (L/s)	PWWF (L/s)	CUM. PWWF (L/s)
BT2	19	10	29	0.319	4.0	4.000	2.262	1.276	3.538	3.538
BT1	7		7	0.077	4.0	4.000	0.406	0.308	0.714	4.252
BS2	6		6	0.066	4.0	4.000	0.348	0.264	0.612	4.864
BS1	0		0	0.000	4.0	4.000	0.000	0.000	0.000	4.864
BL12	40		40	0.440	calculate	3.814	2.320	1.678	3.998	8.862
BL10	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL9	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL8	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL7	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL6	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL5	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL4	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL3	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL2	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BL1	0		0	0.000	4.0	4.000	0.000	0.000	0.000	8.862
BQ-DE	1	29	30	0.330	calculate	4.000	3.422	1.320	4.742	13.604
BM13	34		34	0.374	calculate	3.925	1.972	1.468	3.440	17.044
BM12	3		3	0.033	4.0	4.000	0.174	0.132	0.306	17.350
BM11	37		37	0.407	calculate	3.867	2.146	1.574	3.720	21.070
BM10	3		3	0.033	4.0	4.000	0.174	0.132	0.306	21.376
BM9	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM8	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM7	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM6	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM5	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM4	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM3	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM2	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BM1	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
BL1	0		0	0.000	4.0	4.000	0.000	0.000	0.000	21.376
AB13	72		72	0.792	calculate	3.444	4.176	2.728	6.904	28.279
AB12	4		4	0.044	4.0	4.000	0.232	0.176	0.408	28.687
AB11	3		3	0.033	4.0	4.000	0.174	0.132	0.306	28.993
AB10	2		2	0.022	4.0	4.000	0.116	0.088	0.204	29.197
AB9	5		5	0.055	4.0	4.000	0.290	0.220	0.510	29.707
AB8	2		2	0.022	4.0	4.000	0.116	0.088	0.204	29.911
AB7	2		2	0.022	4.0	4.000	0.116	0.088	0.204	30.115
AB6	4		4	0.044	4.0	4.000	0.232	0.176	0.408	30.523
AB5	4		4	0.044	4.0	4.000	0.232	0.176	0.408	30.931
AB4	25		25	0.275	4.0	4.000	1.450	1.100	2.550	33.481
AB3	341	439	780	8.576	calculate	2.376	57.942	20.373	78.315	111.797
AB2	13		13	0.143	4.0	4.000	0.754	0.572	1.326	113.123
AB1			0	0.000	4.0	4.000	0.000	0.000	0.000	113.123
AA1			0	0.000	4.0	4.000	0.000	0.000	0.000	113.123
AA2	154		154	1.694	calculate	3.034	8.932	5.140	14.072	127.195

Appendix C – Proposed Condition Wastewater Loading Calculations

HUNTER WATER METHOD (PROPOSED)

MH NUMBER	RESIDENTIAL ET	COMMERCIAL ET	ET	ADWF (L/s)	R TYPE	R	SA	PDWF (L/s)	PWWF (L/s)	CUM. PWWF (L/s)
BT2	19		19	0.209	4.0	4.000	1.102	0.836	1.938	1.938
BT1	7		7	0.077	4.0	4.000	0.406	0.308	0.714	2.652
BS2	6		6	0.066	4.0	4.000	0.348	0.264	0.612	3.264
BS1	0		0	0.000	4.0	4.000	0.000	0.000	0.000	3.264
BL12	40		40	0.440	calculated	3.814	2.320	1.678	3.998	7.262
BL11	200		200	2.200	calculated	2.910	11.600	6.401	18.001	25.263
BL10	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BL9	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BL8	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BL7	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BL6	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BL5	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BL4	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BL3	0		0	0.000	4.0	4.000	0.000	0.000	0.000	25.263
BQ-DE	1	29	30	0.330	calculated	4.000	3.422	1.320	4.742	30.005
BM13	34		34	0.374	calculated	3.925	1.972	1.468	3.440	33.445
BM12	3		3	0.033	4.0	4.000	0.174	0.132	0.306	33.751
BM11	37		37	0.407	calculated	3.867	2.146	1.574	3.720	37.471
BM10	103		103	1.133	calculated	3.242	5.974	3.673	9.647	47.118
BM9	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM8	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM7	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM6	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM5	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM4	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM3	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM2	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BM1	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BL2	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
BL1	0		0	0.000	4.0	4.000	0.000	0.000	0.000	47.118
AB13	72		72	0.792	calculated	3.444	4.176	2.728	6.904	54.022
AB12	4		4	0.044	4.0	4.000	0.232	0.176	0.408	54.430
AB11	3		3	0.033	4.0	4.000	0.174	0.132	0.306	54.736
AB10	2		2	0.022	4.0	4.000	0.116	0.088	0.204	54.940
AB9	5		5	0.055	4.0	4.000	0.290	0.220	0.510	55.450
AB8	2		2	0.022	4.0	4.000	0.116	0.088	0.204	55.654
AB7	2		2	0.022	4.0	4.000	0.116	0.088	0.204	55.858
AB6	4		4	0.044	4.0	4.000	0.232	0.176	0.408	56.266
AB5	4		4	0.044	4.0	4.000	0.232	0.176	0.408	56.674
AB4	25		25	0.275	4.0	4.000	1.450	1.100	2.550	59.224
AB3	341	439	780	8.576	calculated	2.376	57.942	20.373	78.315	137.539
AB2	13		13	0.143	4.0	4.000	0.754	0.572	1.326	138.865
AB1			0	0.000	4.0	4.000	0.000	0.000	0.000	138.865
AA1			0	0.000	4.0	4.000	0.000	0.000	0.000	138.865
AA2	154		154	1.694	calculated	3.034	8.932	5.140	14.072	152.938