



Mareeba Shire Council Local Government Infrastructure Plan

Mareeba Shire Council

Background Information on Stormwater

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1. Preliminary

This report provides the background information for the Water Supply and Sewerage Networks to support the development of the Mareeba Shire Council Local Government Infrastructure Plan (LGIP).

The report outlines:

1. The definition of trunk infrastructure (Section 2);
2. The service catchments (Section 3);
3. The demand assumptions and conversions (Section 4);
4. Catchment demands (Section 5);
5. The Desired Standards of Service (DSS) (Section 6);
6. Network planning and modelling (Section 7);
7. Network costings and valuation methodology (Section 8);
8. Schedules of work (Section 9); and
9. Source and supporting documents (Section 10).

2. Definition of Trunk Infrastructure

Table 2.1 : Stormwater Network Trunk Infrastructure

Network	System	Items
Stormwater Network	Quantity	<ul style="list-style-type: none"> • Major natural waterways; • Regional overland flow paths/channels (natural and constructed) • Piped drainage (including pipes >450mm diameter, culverts, manholes, inlets and outlets, multi-cell pipes); • Regional detention and retention facilities.
	Quality	<ul style="list-style-type: none"> • Regional wetlands; • Riparian corridors for rivers; • Bank stabilisation, erosion protection and revegetation of rivers.

3. Service Catchments

There are four (4) service catchments for the Stormwater management network:

- Chillagoe;
- Dimbulah;
- Kuranda; and
- Mareeba.

4. Demand Assumptions and Conversions

The following key assumptions underpinning planning for the trunk stormwater network within the PIA localities.

Table 4.1 — Residential Stormwater Drainage Conversion by Locality

Locality	Network Demand
	Stormwater (Imp area / net dev ha)
Chillagoe	50%
Dimbulah	50%
Kuranda	50%
Mareeba	60%

Table 4.2 — Stormwater Drainage Conversion by use (common for all LGIP area Chillagoe, Dimbulah, Kuranda and Mareeba)
MSC Planning Scheme QPP4.0 Table 4.2.11.1.1 and Table 4.2.11.2.1

Land Use	Precinct	Network Demand	Assumed Demand
		Stormwater (Imp area / net dev ha)	Stormwater (Imp area / dev ha)
Low Density Residential	All Sewered Precincts	50%	5,000 m ²
Low Density Residential	All Unsewered Precincts	60%	6,000 m ²
Commercial		90%	9,500 m ²
Office		90%	8,500 m ²
Industry		80%	8,000 m ²
Community		No worsening	No worsening

Based on Mareeba Shire Council Planning Scheme Table 4.2.11.1.1 and Table 4.2.11.2.1 (page 76)

5. Network Demands

The stormwater network demands have been determined to directly align with the planning assumptions developed for the 2016 LGIP.

The methodology for calculating the demands included:

- Identifying all properties within the applicable catchment
- Extracting from the planning assumptions model the assumed development on each lot at 5-year interval starting 2016 as base year and up to 2031.
- Multiplying the assumed development by the appropriate demand generation rates according to the use designated in the planning assumptions model.
- Aggregating the demands by catchment and over time.

It is important to note that the stormwater network demand has been calculated based on the existing or developable land both residential and non-residential sector and assumed net developable land available for each type of development until 2031. It was observed that the residential development is the primary contribution to the stormwater network demand and non-residential development demand was negligible in all catchments except in Mareeba where the non-residential development contribution was approximately 3% of the residential stormwater network demand.

The catchment based summary of stormwater network demand is provided in Table 5.1.

Table 5.1 : Stormwater Network – assumed demand summary

Column 1 Service Catchment	Column 2 Existing and projected stormwater network demand (Impervious Hectare)			
	2016	2021	2026	2031
Chillagoe	6.64	7.18	7.85	8.58
Dimbulah	15.75	14.29	15.63	17.17
Kuranda	55.03	63.77	68.67	73.89
Mareeba	305.82	354.88	382.08	411.12

6. Desired Standards of Service

The desired standard of service (DSS) details the standards that comprise an infrastructure network most suitable for the local context. The desired standard or service is supported by the more detailed network design standards included in planning scheme policies, legislation, statutory guidelines and other relevant controlled documents about design standard identified in Table 6.1 **Error! Reference source not found..**

Table 6.1 : Desired Standard of Service (DSS) for Stormwater Network from MSC Planning Scheme QPP4.0 Table 4.5.

Measure	Planning Criteria (qualitative standards)	Design Criteria (quantitative standards)
Quantity	Collect and convey the design storm event in natural and engineered channels, a piped drainage network and system of overland flow paths to a lawful point of discharge in a safe manner that minimises the inundation of habitable rooms and protects life.	<ul style="list-style-type: none"> ▪ Department of Natural Resources and Water – <i>Queensland Urban Drainage Manual</i> ▪ FNQROC Development Manual, ▪ Australian Rainfall and Runoff – <i>A Guide to Flood Estimation</i>, ▪ Brisbane City Council - <i>Natural Channel Design Guidelines</i>.
Quality	The water quality of urban catchments and waterways are managed to protect and enhance environmental values and pose no health risk to the community, and water quality of urban catchments and waterways consider provision of sufficient space in waterway corridors to accommodate wetlands and stormwater quality improvement devices.	<ul style="list-style-type: none"> ▪ Provide sufficient space in waterway corridors to accommodate wetlands and stormwater quality improvement devices. ▪ Design cross road structures to provide the appropriate level of flood immunity. ▪ Queensland Water Quality Guidelines 2006 – Environmental Protection Agency ▪ Queensland Waterway Guideline ▪ National Water Quality Guidelines – National Water Quality Management Strategy ▪ Fisheries Act 1994 and Fisheries Regulation 2008. ▪ Fish Habitat Guideline FHG 003 – Fisheries Guidelines for Fish Habitat Buffer Zones
Environmental Impacts	Adopt water sensitive urban design practices and on site water quality management to achieve EPA water quality objectives	<ul style="list-style-type: none"> ▪ Environmental Protection Agency requirements (section 42 Environmental Protection (Water) Policy 1997) ▪ Fisheries Act 1994. ▪ Queensland Waterway Guideline ▪ Employ water sensitive urban design criteria to maximise on-site quantity and quality treatment and limit discharges off site. ▪ Employ (NO net-worsening) criteria on all new development or redevelopment site.
Infrastructure Design / Planning Standards	Design of the stormwater network will comply with established codes and standards	<ul style="list-style-type: none"> ▪ FNQROC Development Design Standards - <i>Design Guidelines set out in Sections D4 and D5 of FNQROC Development Manual</i>. ▪ Department of Natural Resources and Water - <i>Queensland Urban Drainage Manual</i>. ▪ Australian Rainfall and Runoff – <i>A Guide to Flood Estimation</i>, and ▪ Brisbane City Council - <i>Natural Channel Design Guidelines</i> requirements.

7. Network Planning and Modelling

Mareeba Shire Council does not currently have any long term planning or modelling for the stormwater networks.

Council will consider developing a stormwater management plan within the 5-10 year horizon developed as part of the current revision of the LGIP

8. Network Costings and Valuation Methodology

The establishment cost for the stormwater drainage network is calculated using a variety of methods.

8.1 Future Trunk Infrastructure

Future capital projects are estimated using past capital project actual construction costs, quoted prices and unit rates where applicable. Estimates are created in the broader context of Council's capital works program framework and project periodization tool (PPT). It is recognized projects are inherently uncertain and that for the purposes of capital works project planning, that there will be incomplete or sometimes unavailable project scope information on which to base the project estimates. Estimate reliability will progressively improve throughout the project life cycle as a result of systematic review and associated approval processes. The sow model has escalated the establishment costs to the base year of 2016.

It is acknowledged that some projects contain an element of asset renewal. This has been considered at the project level and a portion of the total cost allocated to renewal, and consequently removed from the total value of the trunk works detailed in the Schedule of Works tables.

9. Schedules of Work

Table 9.1 : Stormwater Network Schedule of Works

Map Ref	Trunk infrastructure	Estimated timing	Establishment cost
SW-01	Vaughan Street, Mareeba. Drainage Improvement.	2027	\$220,000.00
SW-04	Atherton Street, Mareeba. Drainage Improvement.	2025	\$500,000.00
SW-05	Tower Street, Chillagoe. Drainage improvement.	2028	\$250,000.00
SW-06	Tilse St, Mareeba	2028	\$700,000
SW-07	Ray Rd, Mareeba	2026	\$1,500,000
SW-08	CBD drainage, Mareeba	2025	\$2,500,000
SW-09	Hoolahan Dr (Emerald End Rd), Mareeba	2023	\$250,000
SW-10	Amaroo drainage, Mareeba	2020	\$600,000
SW-11	Sunset Park Drainage, Mareeba	2022	\$250,000
SW-12	Mareeba Industrial Precinct drainage, Mareeba	2028	\$600,000
SW-13	Ceola Estate drainage, Mareeba	2024	\$600,000
SW-14	Mclver Rd, Mareeba	2026	\$500,000
SW-15	Marinelli drainage, Mareeba	2028	\$500,000
SW-16	Costin St (Basalt Gully) culvert	2028	\$400,000
SW-17	Reynolds St (Basalt Gully) culvert	2028	\$400,000
SW-18	Rankin St (Basalt Gully) culvert	2028	\$400,000
SW-19	Keeble St (Basalt Gully) culvert	2028	\$400,000
SW-20	Blacks Road drainage, Mareeba	2026	\$500,000
		TOTAL	\$11,070,000

10. Source and Supporting Documents

Mareeba Shire Council Local Government Infrastructure Plan – Background Information on Population Assessment, February 2018.

Mareeba Shire Council Planning Scheme, July 2016.

Tablelands Regional Council, *Mareeba Shire Planning Scheme Priority Infrastructure Plan Assumptions and Priority Infrastructure Area*, 2011.

Appendix A. Network Maps

Appendix B. Demand Generation Rate Confirmation