

**Background information for  
Stormwater Network for the  
Sunshine Coast Council  
Local Government Infrastructure Plan**

08 March 2022

## 1.0 Preliminary

This report provides the background information for the Stormwater Network, to support the development of the Sunshine Coast Council Local Government Infrastructure Plan (LGIP).

The report outlines:

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

## 2.0 Service Catchments

### 2.1 Stormwater Quality Network

Planning for the Sunshine Coast Council Stormwater Quality Network has been based on one service catchment for the region. The one service catchment philosophy has been derived from the assumption that while developers provide treatment for their respective developments, the resident and tourist population associated with growth will move around the region visiting other services, tourist attractions and amenity areas placing additional external demand throughout the region. To determine and locate appropriate treatment methods across the one service catchment, 58 treatment catchments were used in the modelling process.

Figure 1 below indicates the extent of the service catchment for the region and identifies the 58 treatment catchments used to determine treatment methods and locations.



**Figure 1: Stormwater Quality Network Service Catchment and Treatment Catchments**

### 2.2 Stormwater Capacity Network

There is currently only one service catchment within the region which satisfies the definition outlined in Section 5.0 Definition of Trunk Infrastructure.

### 3.0 Demand Assumptions and Conversions

A demand base year of 2011 was used for the planning of the stormwater network. This year was consistent with the population data used for council's 2014 Planning Scheme and these figures were summed to provide a regional total. These figures were extrapolated to a demand year of 2031 for the network's planning horizon and aligns with the ABS Census years.

Table 1 below shows the demand increases assumed for the stormwater network's one service catchment between 2011 and 2031.

**Table 1: Existing and Projected Demand for the Stormwater Network**

Service Catchment	Existing and Projected Demand				
	2011 (Base Year)	2016	2021	2026	2031 (Planning Horizon)
Regional Population (people)	254,713	298,233	335,580	374,439	412,849
Total Demand (impervious ha)	9,265	9,520	9,738	9,966	10,191

The following assumptions were made to establish a framework:

- The Total Demand for each of the 58 treatment catchments was determined by applying a fraction impervious to the land uses within each catchment;
- That the regional growth impacts on impervious areas (to be serviced by trunk infrastructure) can only influence the increase in the current impervious area by a maximum of 10%;
- That increased usage of commercial, community parks (open space/amenity) and industrial land uses would place the greatest pressure on receiving waters and as such represented the areas with the greatest demand for treatment. Areas for tourism were also considered. These four factors were used to prioritise and rank the 58 catchments according to their need for treatment;
- There is a shortfall in the current network infrastructure to manage demand, and this shortfall will be addressed over time; and
- The construction of infrastructure to meet the increase in demand progresses over time and usually lags the development (demand).

The base year for the costing of the network is June 2015.

## 4.0 Desired Standards of Service

The Desired Standards of Service (DSS) for the Stormwater Network is provided in **Table 2**. These standards have been derived from Council's Planning Scheme, in particular Planning Scheme Code 9.4.6: Stormwater Management and Planning Scheme Policy SC6.14: Planning Scheme Policy for Development Works.

**Table 2: Desired Standard of Service for the Stormwater Network (Quality and Capacity)**

Desirable Performance Outcomes		Desirable Design Criteria	
PO1	<b>Frequent (low) flow management, waterway stability and sediment transport</b> Protection of waterway stability and ecological low flows through implementation of appropriate discharge regimes.	DC1	Stormwater discharges are managed to achieve the waterway stability objective and the frequent (low) flow management objective consistent with the intent of the Planning Scheme Policy for development works.
PO2	<b>Protection of environmental values</b> Protection or enhancement of the environmental values and water quality objectives <sup>1</sup> of receiving waters or buffer areas.	DC2	As a minimum requirement, treatment measures contribute to achieving the stormwater pollutant load reduction objectives specified in the Planning Scheme Policy for development works.
PO3	<b>Integration</b> Well integrated into the natural and built environment.	DC3	Trunk Stormwater infrastructure must be delivered on land owned or managed by Council, preferably on land that has an existing drainage purpose. In addition the location of infrastructure must be consistent with the intent of the planning scheme policy for development works.
PO4	<b>Natural processes and materials</b> Treatment measures utilise natural processes and materials wherever practicable.	DC4	Treatment measures are designed to be consistent with the intent of the Planning scheme policy for development works.
PO5	<b>Health, safety and aesthetic hazards</b> Stormwater infrastructure is designed to eliminate or minimise health, safety and aesthetic hazards.	DC5	Risks associated with insect breeding, odour and public safety are minimised by designing treatment systems consistent with the intent of the Planning Scheme Policy for development
PO6	<b>Non-Worsening</b> Stormwater infrastructure must meet design standards <sup>2</sup> and must not worsen the characteristics of flooding or problem drainage and must discharge to a legal point of	DC6	Stormwater drainage must be designing in accordance with the Planning Scheme Policy for development works
PO7	<b>Maintenance costs</b> Treatment measures are designed to minimise maintenance, renewal and adaptation costs and the requirement for specialised equipment or maintenance techniques.	DC7	Design achieves acceptable maintenance, renewal and adaptation costs for the project life <sup>3</sup> consistent with the intent of the Planning Scheme Policy for development works.

<sup>1</sup> Water quality objectives are prescribed in Schedule 1 of the Environmental Protection (Water) Policy 2009.

<sup>2</sup> Design Standards for (urban) stormwater drainage infrastructure are prescribed in the Queensland Urban Drainage Manual (2013)

<sup>3</sup> Project life is a minimum of 50 years, unless the asset is proposed to be decommissioned in a shorter period.

## 5.0 Definition of Trunk Infrastructure

The definition of trunk infrastructure for the stormwater network is outlined in **Table 3** below.

**Table 3: Stormwater Network Trunk Infrastructure (Quality and Capacity)**

Stormwater Network	Definition	Example	Exclusions
Quality	Council nominated infrastructure that will provide improvements to the overall water quality objectives, assessed at a regional level.	Infrastructure may include wetlands, stormwater quality treatment devices, waterway and riparian zone bank stabilisation and protection.	Typically, stormwater quality treatment responsibilities conditioned on development do not replace trunk works.
Capacity	Infrastructure servicing infill development identified in a Master Drainage Study (or plan) for council delivery and endorsed by Council at the recommendation of the stormwater network LGIP planner.	Infrastructure may include pipes, channels, detention basins (and other forms of flood storage)	Stormwater Capacity infrastructure responsibilities conditioned on development do not replace trunk works

## 6.0 Network Planning and Modelling

### 6.1 Stormwater Quality Network

The planning of the Stormwater Quality Network has been undertaken using a fit-for-purpose spreadsheet model, developed by a Civil Engineer with RPEQ accreditation.

The premise behind the model is that the need for future treatment in a catchment equates to the treatment demand (based on the landuse/impervious area) less the existing treatment already provided. The demand varies over the planning horizon in line with growth.

The model considers a range of treatment methods which have a treatable impervious area applied to them. This determines the quantity of treatment methods for each treatment catchment. A range of quality treatment methods are considered and include physical (such as GPTs), biophysical (such as bioretention and wetlands) and riparian rehabilitation (such as bank stabilisation works).

### 6.2 Stormwater Capacity Network

Council commissioned SMEC to undertake planning for the Stormwater Capacity Network through the preparation of a *Master Drainage Study and Master Drainage Plans*. These studies consider the infrastructure required to mitigate the impacts of growth on the stormwater network associated with infill development. Network capacity planning was undertaken to address capacity issues and ensure a holistic and equitable approach could be implemented within the catchment.

The stormwater capacity network and future works were determined applying standard industry practices for hydrologic and hydraulic analysis in TUFLOW.

The Master Drainage Study and Master Drainage Plan documents identify future infrastructure beyond the planning horizon of 2031 planning horizon of this Local Government Infrastructure Plan. The number of stormwater projects included within the Local Government Infrastructure Plan has been limited for affordability reasons. As such these documents identify infrastructure required to manage the impacts of infill development beyond the planning horizon of the Local Government Infrastructure Plan.

The stormwater network planning of the Local Government Infrastructure Plan does not provide for trunk infrastructure associated with greenfield development. The network planning assumes that greenfield development is responsible for the delivery of all trunk stormwater infrastructure required to establish a connection to the stormwater network without impact or nuisance (non-worsening). This includes no impact or nuisance to the stormwater network where capacity may be diminished to the detriment of the existing community.

## 7.0 Network Costings and Valuation Methodology

### 7.1 Existing Network Costings

#### 7.1.1 Stormwater Quality

The replacement costs of the existing constructed stormwater quality trunk network were determined by identifying assets which meet the definition of trunk infrastructure in council's asset register and GIS system and then applying appropriate unit rates sourced from Cardno (2015) and Water by Design (2014).

#### 7.1.2 Stormwater Capacity

There are no previous Master Drainage Studies (or plans) completed and constructed by Council to meet the definition in **Table 3: Stormwater Network Trunk Infrastructure (Quality and Capacity)** for Stormwater Capacity. Therefore, there is no existing network to cost for stormwater capacity in the LGIP.

### 7.2 Future Network Costings

This report is an interim update. Future costs included actual costs of infrastructure delivered between 2016 and 2021.

#### 7.2.1 Stormwater Quality

The establishment costs of future infrastructure have been developed using the unit rates described in Section 7.1 Existing Network Costings and utilising factors to account for:

- Construction costs associated with a brownfield environment; and
- Additional base costs which occur in the first two years of the three-year delivery cycle.

The network model is also used to inform Council's Capital Works Program and includes allowances for planning and design costs. To avoid duplication of these costs, the factor (1.2) applied in the Sunshine Coast Council Schedule of Works Model has been removed from the costings listed in **Error! Reference source not found. of Section 8.0 Schedules of Work.**

Additional costs to account for cyclic network planning and annual field monitoring have also been included. These costs have been included to ensure network planning is at its most current, reflecting the latest on-the-ground opportunities and treatment best practice. The annual field monitoring costs give council the opportunity to identify any performance issues within the network which may be remedied through future network planning.

#### 7.2.2 Stormwater Capacity

Concept cost estimates for future infrastructure have been developed through the provision of Master Drainage Studies and Master Drainage Plans by various reputable consulting firms. These documents are listed in **Section 9.0 Source and Supporting Documents**. Cost estimates were based on pricing estimates at the time of the study and are outlined in **Error! Reference source not found. of Section 8.0 Schedules of Work.**



## 8.0 Schedules of Work

The schedule of works for the Stormwater Network is provided in **Error! Reference source not found.** below.

Works beyond the planning horizon of 2031 to Ultimate) have been included to demonstrate the works required to meet Sunshine Coast Council's DSS outlined in **Table 2: Desired Standard of Service for the Stormwater Network (Quality and Capacity).**

**Table 4: Stormwater Network Schedule of Works**

Map Tile	Map ref	Trunk infrastructure	Estimated timing	Establishment cost
SQN33	SWC16_001	Toral Drive MDS Stage 1	2016-2021	\$700,374
SQN33	SWC16_002	Toral Drive MDS Stage 2A	2016-2021	\$447,678
SQN33	SWC16_003	Toral Drive MDS Stage 2B	2016-2021	\$418,766
SQN33	SWC16_004	Toral Drive MDS Stage 2C	2016-2021	\$186,311
SQN33	SWC16_005	Toral Drive MDS Stage 3,7	2016-2021	\$751,994
SQN33	SWC16_006	Toral Drive MDS Stage 4	2021-2026	\$448,402
SQN33	SWC16_007	Toral Drive MDS Stage 5	2021-2026	\$627,603
SQN33	SWC16_008	Toral Drive MDS Stage 6	2021-2026	\$612,730
SQN45	SWQ15_005	Caloundra (Arthur Street), LGIP GPT	2016-2021	\$377,488
SQN11	SWQ15_006	Russell St LGIP Wetland	2016-2021	\$557,310
SQN49	SWQ15_007	Coochin Ck, LGIP Stormwater, (Caralan Way Wetland)	2016-2021	\$106,764
SQN45	SWQ15_023	Moffat Beach (Grigor Street), LGIP Stormwater (Stage 1)	2016-2021	\$173,873
SQN45	SWQ15_042	Duckholes Creek LGIP Sediment Basin\Wetland	2016-2021	\$663,311
SQN45	SWQ15_050	Caloundra (Otranto St) GPT, LGIP Stormwater (formerly Tooway Ck)	2016-2021	\$173,873
SQN20 /22	SWQ15_053	Fishermans Rd Industrial Precinct LGIP GPT + Wetland	2021-2026	\$435,433
SQN16	SWQ15_054	Montville, Russell Family Park Carpark Sediment Runoff LGIP (Bitumise or Swale)	2016-2021	\$106,764
SQN35	SWQ15_057	LaBalsa Park LGIP Carpark Biopods	2016-2021	\$145,581
SQN32	SWQ15_058	Mountain Ck (Tilapia Court) LGIP Wetland and Riparian	2016-2021	\$730,954
SQN22	SWQ15_059	Maroochydore (Forth Avenue) LGIP GPT	2016-2021	\$469,763
SQN22	SWQ15_060	Maroochydore (Cornmeal Pde), LGIP GPT	2016-2021	\$469,763
SQN22	SWC17_004	School Rd Maroochydore MDS, Strat2, Stage4a	2016-2021	\$100,282
SQN22	SWC17_007	School Rd Maroochydore MDS, Strat2, Stage7	2016-2021	\$135,654
SQN34	SWC19_002	Alexandra Headland MDS Strat 2 Stage 2a	2016-2021	\$1,654,838
SQN18	SWQ15_062	Petrie Ck Catchment, Riparian LGIP	2016-2021	\$160,146
SQN18	SWQ15_066	Robertson Drive Park Bioretention	2016-2021	\$261,098
SQN45	SWQ15_086	Coondibah Creek Riparian Works	2021-2026	\$392,026
SQN19	SWQ16_017	Lower Maroochy River Catchment, LGIP GPT	2031-2036	\$194,091
SQN21	SWQ16_018	Lower Maroochy River Catchment, LGIP GPT	2026-2031	\$565,248
SQN20	SWQ16_019	Lower Maroochy River Catchment, LGIP Riparian	2026-2031	\$638,458

Map Tile	Map ref	Trunk infrastructure	Estimated timing	Establishment cost
SQN21	SWQ16_020	Lower Maroochy River Catchment, LGIP GPT	2026-2031	\$565,248
SQN19	SWQ16_021	Lower Maroochy River Catchment, LGIP GPT	2026-2031	\$565,248
SQN11	SWQ16_023	Lower Maroochy River Catchment, LGIP GPT	2026-2031	\$565,248
SQN20	SWQ16_025	Lower Maroochy River Catchment, LGIP Riparian	2031-2036	\$404,356
SQN34	SWQ16_027	Alexandra Healand (Mari Street) LGIP Stormwater	2031-2036	\$3,192,288
SQN46	SWQ16_029	Golden Beach - Passive irrigation	2016-2021	\$306,743
SQN45	SWQ16_030	Kings Beach and Amphitheatre Precinct, LGIP bioretention	2021-2026	\$1,240,892
SQN22	SWQ16_032	Cornmeal Creek Corridor LGIP Riparian	2021-2026	\$570,169
SQN22	SWC17_001	School Rd Maroochydore MDS, Strat2, Stage1	2021-2026	\$1,482,033
SQN34	SWC19_001	Alexandra Headland MDS Strat 2 Stage 1	2021-2026	\$6,393,719
SQN45	SWC19_015	Caloundra MDS Strat 2 Stage 3	2021-2026	\$5,472,209
SQN22	SWC19_029	Maroochydore MDP Stage 1	2021-2026	\$3,703,892
SQN45	SWC19_052	Kings Beach and Shelly Beach MDP Strat 2 Stage 1	2021-2026	\$6,182,206
SQN49	SWC21-002	Beerwah Master Drainage Plan Stage 2	2021-2026	\$1,191,238
SQN35	SWQ16_078	Mooloolah River Estuary LGIP GPT	2021-2026	\$913,752
SQN35	SWQ16_079	Technology Drive Passive Irrigation	2021-2026	\$189,925
SQN18	SWQ16_085	Burnside Park Passive Irrigation	2021-2026	\$195,905
WOR	SWQ15_051	Regional Trunk Stormwater Outfall Monitoring	2016-2021	\$1,827,407
SQN21	SWQ16_038	Marcoola (Airport Drive) LGIP GPT	2031-2036	\$421,382
SQN22	SWQ16_039	Maroochydore LGIP GPT	2021-2026	\$1,040,967
SQN19	SWQ16_040	Petrie Ck Catchment, Riparian LGIP	2021-2026	\$1,115,314
SQN18	SWQ16_041	Petrie Ck Catchment, Riparian LGIP	2021-2026	\$611,855
SQN18	SWQ16_042	Petrie Ck Catchment, Riparian LGIP	2026-2031	\$638,458
SQN18	SWQ16_046	Petrie Ck Catchment, LGIP GPT	2026-2031	\$565,248
SQN18	SWQ16_047	Petrie Ck Catchment, LGIP GPT	2026-2031	\$565,248
SQN19	SWQ16_049	Petrie Ck Catchment, LGIP GPT	2026-2031	\$565,248
SQN18	SWQ16_050	Petrie Ck Catchment, LGIP GPT	2026-2031	\$565,248
SQN22	SWQ16_051	Friendship Park Bioretention	2026-2031	\$308,588
SQN22	SWQ16_052	Cornmeal Catchment LGIP GPT	2026-2031	\$749,124
SQN22	SWQ16_054	Cornmeal Catchment LGIP GPT	2026-2031	\$749,124
SQN32	SWQ16_057	Cornmeal Catchment LGIP GPT	2031-2036	\$749,124
SQN45	SWQ16_059	Andrea Ahearn Park/Cooroora St LGIP Veg Infiltration Trench	2021-2026	\$1,064,628
SQN45	SWQ16_061	Mooloolah Coastal Creeks LGIP Sediment Basin	2026-2031	\$749,124
SQN40	SWQ16_064	Lower Mooloolah River LGIP Riparian	2031-2036	\$638,458
SQN44	SWQ16_065	Sunjewel Blvd Playground (Snowdrop Avenue) LGIP Wetland	2016-2021	\$686,342
SQN32	SWQ16_066	Wilgan Place Bushland Reserve Riparian Works	2021-2026	\$203,952
SQN32	SWQ16_067	Wilgan Place Bushland Reserve Sedimentation Basin	2021-2026	\$248,005
SQN28	SWQ16_068	Kolora Park Sediment Basin	2021-2026	\$713,401

Map Tile	Map ref	Trunk infrastructure	Estimated timing	Establishment cost
SQN32	SWQ16_070	Cornmeal Creek LGIP GPT	2031-2036	\$749,124
SQN46	SWQ16_071	Lamerough Creek LGIP GPT	2031-2036	\$561,843
SQN19	SWQ16_072	Lower Maroochy River Estuary LGIP GPT	2031-2036	\$421,382
SQN35	SWQ16_075	Technology Drive Linear Park LGIP GPT	2021-2026	\$420,548
SQN35	SWQ16_076	St Vincents Court Park LGIP Vegetated Infiltration	2026-2031	\$766,149
SQN35	SWQ16_077	Melody Court Park LGIP GPT	2021-2026	\$420,548
SQN18	SWQ16_084	Petrie Creek LGIP GPT	2031-2036	\$561,842
SQN44	SWQ16_088	Meridan Fields Sportsground WSUD	2016-2021	\$2,859,758
SQN45	SWQ16_089	Clarke Place Park LGIP GPT	2021-2026	\$420,548
SQN18	SWQ16_091	Petrie Creek LGIP GPT	2026-2031	\$565,248
SQN18	SWQ16_092	Kings Place Park LGIP Bioretention	2016-2021	\$276,443
SQN18	SWQ16_093	Siverwood Drive Park LGIP Bioretention	2026-2031	\$358,866
SQN19	SWQ16_094	June Blanck Park LGIP Bioretention	2016-2021	\$422,292
SQN18	SWQ16_095	Moss Day Park LGIP Veg Channel/Riparian	2021-2026	\$129,116
SQN18	SWQ16_096	Glenbrook Downs Park LGIP Veg Channel	2026-2031	\$935,581
SQN32	SWQ16_097	Sheen Court Park LGIP Swale/Natural Channel	2021-2026	\$305,673
SQN32	SWQ16_098	Forestwood Drive Park LGIP Bioretention	2026-2031	\$583,923
SQN22	SWQ16_099	McArthur Park LGIP Bioretention	2026-2031	\$1,995,180
SQN32	SWQ16_100	Lakeshore Avenue Park LGIP Wetlands	2021-2026	\$983,302
SQN22	SWQ16_101	Kuluin Neighbourhood Park LGIP Riparian	2026-2031	\$662,932
SQN11	SWQ16_102	Cordellia St park LGIP Bioretention	2016-2021	\$410,851
SQN32	SWQ16_103	Lineman Ave LGIP Biorention	2026-2031	\$707,411
SQN22	SWQ16_104	Cumberland Way LGIP Riparian	2021-2026	\$130,529
SQN11	SWC19_037	Coolum Beach MDP Strat 2 Stage 1	2026-2031	\$7,733,518
SQN22	SWC21-032	Maroochydore West Master Drainage Plan Stage 6	2026-2031	\$2,111,602
SQN45	SWC21-042	Kawana Master Drainage Plan Stage 1	2026-2031	\$9,871,761
<b>TOTAL</b>				<b>\$95,983,862</b>

## 9.0 Source and Supporting Documents

Cardno, (2015), *Roads and Stormwater Infrastructure Unit Rates*

Cardno, (2019), *Cotton Tree to Picnic Point Master Drainage Plan*

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