

Local Government Infrastructure Plan

**Sewerage Network Extrinsic Material Report
11/03/2024 – Rev 3**

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1.0 Background

Redland City Council has prepared a Local Government Infrastructure Plan (LGIP) in accordance with the *Planning Act 2016* (PA) and associated rules. The LGIP identifies the type, scale, location and timing of development within the local government area for a ten (10) year period from 2021 to 2031. It also identifies trunk infrastructure to service that growth at the desired standard of service.

The following trunk infrastructure networks are included within the LGIP:

- (a) Water supply network
- (b) Sewerage network**
- (c) Transport network
- (d) Stormwater quantity network
- (e) Public Parks and land for community facilities network.

The Redland City Council LGIP is Part 4 and Schedule 3 of the Redland City Plan 2018.

1.1 Purpose of report

This extrinsic material report has been prepared to assist in the interpretation of the Redland City Council LGIP. The report summarises the inputs and methodology used to prepare the **sewerage network** component of the LGIP and references all background studies and reports relevant to its preparation.

2.0 Planning assumptions

2.1 Development projections

Projections of dwellings and non-residential gross floor area (GFA) provide a basis for the planning of sewerage network infrastructure within each service (planning) catchment.

Development projections for the Redland City Council local government area were prepared in January 2022 and are documented in the report titled Development Projections Modelling Prepared for Redland City Council (PIE Solutions, January 2022).

2.2 Demand assumptions

Prior to undertaking network planning, projections of dwellings and non-residential gross floor area (GFA) were converted into units of demand. Demand in the sewerage network is expressed in equivalent persons (EP) which represents an average daily wastewater load (litres per day).

It is a requirement of the LGIP template that the demand generated by each land-use area is reported for each trunk infrastructure network. These area based demands for the sewerage network have been prepared by applying the industry standard demand rates to the planned density for each land-use area stated in Table 1.

Table 1: Demand generation rates used to convert development projections into sewerage demand (EP)

Column 1 Area classification	Column 2 LGIP development types	Column 3 Sewerage network planned demand generation rate (EP / net dev ha)
Residential development		
Character residential zone	Detached dwelling	45.0
Emerging community zone	Detached dwelling, Attached dwelling	51.0
Low density residential zone	Detached dwelling	45.0
Precinct LDR1 Large lot residential	Detached dwelling	15.0
Precinct LDR2 Park residential	Detached dwelling	5.0
Precinct LDR3 Point Lookout residential	Detached dwelling	45.0
Precinct LDR4 Kinross Road	Detached dwelling	18.8
Low-medium density residential zone	Detached dwelling, Attached dwelling	51.0
Precinct LMDR1 SE Thornlands	Detached dwelling, Attached dwelling	51.0
Precinct LMDR2 Kinross Road	Detached dwelling, Attached dwelling	51.0
Medium density residential zone	Attached dwelling	74.8
Precinct MDR1 Park living, Capalaba	Attached dwelling	136.0
Precinct MDR2 Mount Cotton Road, Capalaba	Attached dwelling	102.0
Precinct MDR3 Shore Street East, Cleveland	Attached dwelling	136.0
Precinct MDR4 Cleveland	Attached dwelling	102.0
Precinct MDR5 Esplanade, Redland Bay	Attached dwelling	102.0
Precinct MDR6 SE Thornlands	Attached dwelling	74.8
Precinct MDR7 Erapah Creek, SE Thornlands	Attached dwelling	74.8
Precinct MDR8 Kinross and Boundary Roads	Attached dwelling	74.8
Precinct MDR9 Kinross Road	Attached dwelling	74.8
Tourist accommodation zone	Attached dwelling	74.8
Non-residential and mixed development		

Column 1 Area classification	Column 2 LGIP development types	Column 3 Sewerage network planned demand generation rate (EP / net dev ha)
Local centre zone	Commercial, Retail, Attached dwelling	62.0
District centre zone	Commercial, Retail, Attached dwelling	92.8
Major centre zone (Victoria Point)	Commercial, Retail	142.5
Mixed use zone	Retail	80.0
Principal centre zone (Cleveland)	Commercial, Retail, Attached dwelling	196.2
Principal centre zone (Capalaba)	Commercial, Retail, Attached dwelling	240.2
Specialised centre zone (Redland Hospital)	Commercial, Retail, Community purpose (Hospital)	269.7
Low impact industry zone	Retail, Industrial (low impact)	22.5
Medium impact industry zone	Retail, Industrial (medium impact)	28.6
Waterfront and marine industry zone	Retail, Industrial	23.1
Precinct CF1 cemeteries and crematoria	Community purpose	6.0
Precinct CF2 community facilities	Community purpose	27.0
Precinct CF3 educational establishments	Community purpose (secondary school/college/primary school)	94.0
Precinct CF4 emergency services	Community purpose	23.0
Precinct CF5 places of worship	Community purpose	27.0
Precinct CF6 infrastructure	(no density outcome nominated)	-
Precinct CF7 future transport/green space/trail corridors	(no density outcome nominated)	-
Precinct CF8 Commonwealth facilities	Community purpose	11.0
Precinct CF9 passenger ferry terminals	Community purpose	11.0

A summary of total demand for each sewerage service catchment is provided in Table 2.

Table 2: Existing and projected demand (EP) for each sewerage service catchment

Column 1 Service catchment	Column 2 Existing and projected demand (EP)			
	2021 (base date)	2026	2031	Ultimate Development
Inside PIA	176,200	184,026	192,476	236,585
Outside PIA	6,782	8,486	11,598	27,058

3.0 Desired standards of service

Planning of the sewerage network required the Desired Standards of Service (DSS) to be applied to the forecast demand (EP) in each service catchment. The desired standards of service for the sewerage network are:

- a) provide a reliable network that collects, stores, treats and releases sewage from premises;
- b) design the sewerage network in accordance with:
 - i. the South East Queensland Water Supply and Sewerage Design and Construction Code 2013;
 - ii. the key standards stated in Table 3 —Key standards for the sewerage network.

Table 3: Key standards for the sewerage network

Column 1 Description of standard	Column 2 Standard
Average dry weather flow (ADWF)	210L/EP/day
Peak dry weather flow (PDWF)	$C2 \times \text{ADWF}$ where $C2 = 4.7 \times (\text{EP})^{-0.105}$
Peak wet weather flow (PWWF) for RIGS	5 x ADWF
Minimum velocity	0.75m/s
Maximum velocity	3m/s
Preferred velocity	1.0-1.5m/s

4.0 Sewerage network planning

The types of infrastructure listed in Table 4 may be considered to be trunk sewerage infrastructure for the purpose of LGIP planning.

Table 4: Trunk sewerage infrastructure types

Trunk sewerage infrastructure types
Trunk infrastructure for the sewerage network includes land and work for the following items: (a) rising mains not associated with private sewerage pump stations and water treatment plants; (b) reuse transport mains; and (c) gravity sewers on the mainland which service a minimum 800 ET; and (d) gravity sewers on the mainland which provide a connecting function between an upstream trunk maintenance structure and downstream trunk maintenance structure; and (e) gravity sewers on North Stradbroke Island which service a minimum 400 ET; and (f) gravity sewers on North Stradbroke Island which provide a connecting function between an upstream trunk maintenance structure and downstream trunk maintenance structure; and (g) pump stations (excluding private pump stations), manholes and fittings associated with a trunk gravity sewer; and (h) odour and corrosion control systems; and (i) monitoring systems associated with a trunk item; and (j) sewerage treatment plants, storage facilities, release systems and associated monitoring systems.

Planning for the sewerage network includes land acquisition where this is an integral part of a project. Planning undertaken for the area to be serviced with a sewerage network is documented in the Redland City Council Sewer Network Master Plan prepared by Redland Water and dated December 2022.

5.0 Infrastructure costs

The PA defines establishment cost of trunk infrastructure to be-

- (a) *For existing infrastructure –*
 - i. *The current replacement cost of the infrastructure as reflected in the relevant local government asset register; and*
 - ii. *The current value of the land acquired for the infrastructure*
- (b) *For future infrastructure – all the costs of land acquisition, financing, and design and construction, for the infrastructure*

The establishment cost of trunk sewerage infrastructure has been calculated as follows.

5.1 Cost of land

The establishment cost of existing land used for trunk sewerage infrastructure was obtained from Redland City Council's asset register.

Where land is required for future trunk sewerage infrastructure, the establishment cost is derived from an assessment provided by Redland City Council's Property Services Team.

5.2 Cost of works

The establishment cost of existing trunk sewerage infrastructure (works) was obtained from Redland City Council's asset register.

The establishment cost of future trunk sewerage infrastructure (works) was calculated using unit rates used by Redland City Council, for asset valuation purposes. The report, Valuation of Water and Wastewater Assets (Cardno, May 2022) includes a base cost and then additional adjustment factors depending on estimates of local site conditions.

5.3 On-cost allowance

On-costs represent the owner's project costs and may include master planning, survey, geotechnical investigations, design, project management, contract administration and environmental investigations. An on-cost allowance of:

- 20% has been applied to future projects within the sewerage network that are identified as Infrastructure provider (Council) delivered in the schedule of works model. This is consistent with the on-cost (overheads) allowance stated in the Redland City Council Sewer Network Master Plan prepared by Redland Water and dated December 2022.
- 11% has been applied to future projects within the sewerage network that are identified as Developer delivered in the schedule of works models. This is consistent with the maximum construction on costs stated in the Redland City Council Adopted Infrastructure Charges Resolution (No. 3.2) 2023.

No on-cost allowance was applied to land costs within the sewerage network.

5.4 Contingency allowance

A contingency allowance is included in the establishment cost of future trunk infrastructure to deal with known risks. A contingency allowance of:

- 15% has been applied to future projects within the sewerage network that are to be delivered within 1-5 years.
- 25% has been applied to future projects within the sewerage network that are to be delivered within 6-10 years.

No contingency allowance was applied to land costs within the sewerage network.

6.0 Sewerage network schedule of works

Table 5 provides a list of trunk infrastructure planned for the sewerage network and included in the LGIP.

Table 5: Future trunk sewerage infrastructure included in the LGIP

Column 1 Map reference	Column 2 Trunk infrastructure	Column 3 Estimated timing	Column 4 Establishment cost ¹
FGM_CLEV_05	378m of DN225 Sewer Gravity Main located along Middle Street, Cleveland	2026	\$354,417
FGM_CLEV_03	438m of DN225 Gravity Main located along Shore St East, Cleveland	2026	\$376,437
FGM_CLEV_08	284m of DN450 Gravity Main located along Waterloo St, Cleveland	2031	\$381,841
FGM_VP_01	278m of DN215 Gravity Main located between Church Street and Pelican Street, Victoria Point	2026	\$231,987
FGM_THO_02	710m of DN525 Gravity Main between Ivy Street and Henry Street, Thorneside	2024	\$1,069,472
AUG_Pump_004	Pump station upgrade for SPS004 to increase pump capacity	2031	\$1,397,704
AUG_Pump_004	528m of DN200 Rising Main located between Shore Street West and Ross Creek, Cleveland	2031	\$488,042
AUG_Pump_002	Pump station upgrade for SPS002 to increase pump capacity	2031	\$1,605,172
AUG_Pump_002	340m of DN150 Rising Main located along Middle Street, Cleveland	2031	\$274,790
AUG_Pump_090	Pump station upgrade for SPS 090 to increase pump capacity	2026	\$872,565
AUG_Pump_090	800m of DN150 Rising Main located along Banana Street and Peel Street, Weinam Creek	2026	\$591,798
AUG_Pump_095	Pump station upgrade for SPS 095 to increase pump capacity	2026	\$378,979
AUG_Pump_095	261m of DN100 Rising Main located between Anita Stret and Pinelands Circuit, Redland Bay	2026	\$166,357
AUG_PS023_LL	Pump station upgrade for SPS 023 to increase pump capacity	2024	\$378,979
AUG_Pump_012	Pump station upgrade for SPS 012 to increase pump capacity	2024	\$641,397
AUG_Pump_100	Pump station upgrade for SPS 100 to increase pump capacity	2024	\$1,285,888
AUG_Pump_147	Pump station upgrade for SPS 147 to increase pump capacity	2024	\$1,476,758
AUG_Pump_061	Pump station upgrade for SPS 061 to increase pump capacity	2024	\$2,009,001
AUG_Pump_138	Pump station upgrade for SPS138 to increase pump capacity	2024	\$378,979
AUG_Pump_152	Pump station upgrade for SPS 152 to increase pump capacity	2024	\$378,979
AUG_Pump_154	Pump station upgrade for SPS154 to increase pump capacity	2024	\$2,809,575
AUG_Pump_054	Pump station upgrade for SPS054 to increase pump capacity	2031	\$948,440

¹ The establishment cost is expressed in cost terms as at the base date (June 2021)

Column 1 Map reference	Column 2 Trunk infrastructure	Column 3 Estimated timing	Column 4 Establishment cost ¹
AUG_Pump_069	Additional pump capacity for increase in connected lots.	2026	\$68,096
AUG_Pump_071	Additional pump capacity for increase in connected lots and to align with new rising main.	2026	\$5,965,251
AUG_Pump_070	Additional pump capacity for increase in connected lots.	2026	\$68,096
AUG_Pump_072	Additional pump capacity for increase in connected lots.	2026	\$68,096
S1	Construction of pump station to service growth in the SWVP catchment.	2024	\$636,191
S2	Construction of internal rising main to service growth in SWVP catchment. Approximately 412m of DN 125.	2024	\$176,370
S6	Construction of external rising main to service growth in SWVP catchment. Approximately 279m of DN 125.	2024	\$296,049
S5	Decommission Sewage Pump Station 118	2024	\$44,263
S8	940m of DN300 and DN 375 Gravity Main between Carnoustie Ct to Sewage Pump Station 118 to Sant Andrews Ct	2024	\$3,672,486
S9	1100m of DN225 Gravity Main between Double Jump Rd and Prescoter Dr	2024 - 2025	\$1,942,325
S10	Construction of external rising main to service growth in SWVP catchment. Approximately 550m of DN 125.	2024	\$201,566
Cleveland WWTP upgrade - 001	Upgrade of treatment capacity to service growth and maintain compliance outcomes.	2028	\$4,473,870
Thorneside WWTP upgrade - 001	Upgrade of treatment capacity to service growth and maintain compliance outcomes.	2025 - 2027	\$117,339,130
Victoria Point WWTP upgrade - 001	Upgrade of treatment capacity to service growth and maintain compliance outcomes.	2024 - 2026	\$89,030,241
Cleveland catchment transfers - 001	Construction of transfer pumps, pipes and effluent main to service growth and maintain compliance outcomes.	2024 - 2026	\$60,817,780
Capalaba catchment transfer -001	Construction of transfer pumps, pipes and effluent main to service growth and maintain compliance outcomes.	2027 - 2028	\$90,626,368
Victoria Point WWTP release upgrade - 001	Upgrade of treatment capacity to service growth and maintain compliance outcomes.	2024 - 2027	\$18,134,684
TOTAL			\$412,058,417

