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Background information for

Stormwater Drainage Network for the

Western Downs Regional Council

Local Government Infrastructure Plan

21 April 2016

Version 2



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1.0 Preliminary

This report provides the background information for the Stormwater Drainage Network, to support the development of the Western Downs Regional Council (WDRC) 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

The trunk Stormwater Drainage Network in WDRC is divided into a number of catchments, focussed primarily on the area within the PIA. The catchments are shown on the maps identified in Table 2.1.

Table 2.1 — Stormwater drainage catchments

Catchment Name	Map Reference
Wandoan	LGIP-D-01
Miles	LGIP-D-02
Chinchilla	LGIP-D-03
Jandowae	LGIP-D-04
Tara	LGIP-D-05
Dalby	LGIP-D-06

3.0 Demand assumptions and conversions

The demand assumptions for each catchment are outlined in Table 2.2. Council refers to Queensland Urban Drainage Manual for conversions of developable area to impervious area. These conversions are shown in Table 2.3.



Table 2.2 — Stormwater drainage demand

Service catchment	Stormwater drainage demand (impervious hectares)			
	2016	2021	2026	Ultimate 2031
Chinchilla	194.38	208.57	222.77	237.24
Dalby	375.08	402.47	429.87	457.78
Miles	77.11	82.74	88.38	94.11
Wondoan	46.42	49.82	53.21	56.66
Tara	28.47	30.55	32.63	34.75
Jandowae	42.96	46.09	49.23	52.43

Table 2.3 — Stormwater drainage conversions

Planning scheme zone	QUDM conversion developable hectare to impervious hectare
Community Facilities Zone	0.9
District Centre Zone	0.9
Local Centre Zone	0.9
Low Density Residential Zone	0.575
Low Impact Industry Zone	0.9
Major Centre Zone	0.9
Medium Density Residential Zone	0.8
Medium Impact Industry Zone	0.9
Recreation and Open Space Zone	0
Rural Residential Zone	0.15

The establishment and replacement costs of the networks have been based on 2014 valuation rates and escalated to 2016 (refer Section 7.0).

4.0 Desired standards of service

The Desired Standard of Service for the Stormwater drainage network is provided in Table 4.1.

Table 4.1 — Stormwater drainage network desired standards of service

Measure	Planning criteria (qualitative standards)	Design criteria (quantitative standards)
Quantity	Collect and convey stormwater 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"> Queensland Urban Drainage Manual—NRM Local government standards in planning scheme and planning scheme policies
Quality	The water quality of urban catchments and waterways is managed to protect and enhance environmental values and pose no health risk to the community.	<ul style="list-style-type: none"> Local water quality guidelines prepared in accordance with the National Water Quality Management Strategy Queensland Water Quality Guidelines 2009— Environmental Protection Agency (EPA) (where local guidelines do not exist) National Water Quality Guidelines— National Water Quality Management Strategy (where local or regional guidelines do not exist)
Environmental impacts	Adopt water-sensitive urban design principles and on-site water quality management to achieve EPA water quality objectives.	<ul style="list-style-type: none"> Section 21 Environmental Protection [Water] Policy 2009 Queensland Urban Stormwater Quality Planning Guidelines 2010 Local Government standards in planning scheme and planning scheme policies
Infrastructure design/planning standards	Design of the stormwater network will comply with established codes and standards.	<ul style="list-style-type: none"> Queensland Urban Drainage Manual—NRM Local government standards in planning scheme and planning scheme policies Natural Channel Design Guidelines

5.0 Definition of trunk infrastructure

The definition of Trunk Infrastructure for the Stormwater drainage network is provided in Table 5.1.

Table 5.1 — Stormwater Drainage Network Trunk Infrastructure

Network	System	Items
Stormwater Management	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.

6.0 Network planning and modelling

The planning for the stormwater drainage network has been compiled through a number of methods. These tasks have included a variety of fit for purpose methodologies as appropriate for the catchment needs and the detailed analysis available. A summary of the planning and future works identification methodology for each catchment is provided in Table 6.1.

Table 6.1 — Stormwater Drainage Network Planning Methodology

Catchment Name	Planning and Future Works Identification
Wandoan	The future works required to service the Wandoan stormwater drainage network was determined in a detailed hydraulic analysis undertaken by Brandon & Associate Consulting Engineers in 2004. The report entitled “Wandoan Stormwater Drainage Concept Master Plan Report” details the methodology and recommended future works.
Miles	The future works required to service the Miles stormwater drainage network was determined in a hydraulic analysis undertaken by Western Downs Regional Council’s Design Office in 2015. The study relied on the Western Downs Flood Study (Water Technology, 2014) for key inputs.
Chinchilla	The future works required to service the Chinchilla stormwater drainage network was determined in a hydraulic analysis undertaken by Western Downs Regional Council’s Design Office in 2015. The study relied on the Western Downs Flood Study (Water Technology, 2014) for key inputs. The outcomes are documented in the Chinchilla Master Stormwater Concept Plan.
Jandowae	No future works have been identified for Jandowae.
Tara	No future works have been identified for Tara.
Dalby	The future works required to service the Dalby stormwater drainage network was determined in an hydraulic analysis undertaken by Western Downs Regional Council’s Design Office in 2015. The outcomes are documented in the Dalby Master Stormwater Concept Plan.



7.0 Network costings and valuation methodology

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

7.1 Existing Trunk Infrastructure

The replacement cost of the existing constructed trunk infrastructure has been determined by identifying those assets in the register that meet the definition of trunk for the stormwater network and retrieving the assigned replacement values in the asset register, specifically the fields named “CVR_At_Cost_Value” or “total replacement value”.

The values in the asset register were initially established as a result of the report “Valuation of Western Downs Infrastructure Assets Roads Bridges Aerodromes and Storm water Revaluation of Non-Current Assets in Accordance with Australian Accounting Standards” (APV, 2012) and have been escalated to June 2014 asset valuation figures (refer *Infrastructure Services Audit Committee Report 2014 Asset Management Annual Review* (WDRC, June 2014)). The SOW model has escalated the replacement costs to the base year of 2016.

7.2 Future Trunk Infrastructure

The establishment cost of future infrastructure has generally been based on cost estimates developed by the Civil Design Coordinator. The estimates have been developed using rates as developed for the existing trunk infrastructure (Refer to Section 7.1), adjusted to allow for local conditions and delivery methods, where appropriate. On-costs have been included in the cost estimates based on Council’s anticipated costs for these services, on average a rate of 10% has been applied. Contingency has been included based on the project delivery horizon. The following rates have been applied:

- Delivery in 0 – 5 years: 7.5%
- Delivery in 5 – 10 years: 15%
- Delivery in 10 – 20 years: 20%
- Delivery in 20+ years: 25%

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.



8.0 Schedules of work

The schedule of works for the Stormwater drainage network is provided in Table 8.1 and shown in the maps listed in section 2:

The establishment costs have been escalated to 2016 based on the methodology in the Schedule of Works model.

Table 8.1 — Stormwater drainage network schedule of works

Column 1 Map reference	Column 2 Trunk infrastructure	Column 3 Estimated timing	Column 4 Establishment cost
D0002	Gaske Ln Drainage Projects - Stage 1 & 2 - Chinchilla	2016	\$ 2,418,750.00
D0052	Northern Trunk Drain - Chinchilla	2018	\$ 3,762,500.00
D0053	Malduf Street Drainage - Chinchilla	2021	\$ 6,450,000.00
D0031/0055	Reid-Hypatia Street Drainage - Chinchilla	2016	\$ 7,310,000.00
D0072	Price Street Drainage - Chinchilla	2020	\$ 7,326,852.78
D0007	Foster Street Drainage - Chinchilla	2017	\$ 913,750.00
D0035/D0037	Pilkington Street Drainage - Chinchilla	2017	\$ 1,881,250.00
D0073	Windmill Street Drainage - Chinchilla	2020	\$ 2,696,100.00
D0074	East Street Drainage - Wandoan	2020	\$ 1,568,059.50
D0075	Royd St Drainage - Wandoan	2020	\$ 1,720,731.00
D0076	North St Drainage - Wandoan	2018	\$ 161,250.00
D0065	Hamlyn St Drainage - Wandoan	2021	\$ 389,491.85
D0066	Zupp Rd Drainage - Wandoan	2017	\$ 249,905.25
D0067	Future Channel 1 - Acacia Dr to Dawson Street - Miles	2019	\$ 266,232.35
D0068	Future Channel 2 - Condamine Street to Colamba Street - Miles	2023	\$ 291,883.80
D0069	Gaske Ln Drainage Projects - Stage 1 & 2 - Chinchilla	2025	\$ 204,928.85
D0070	Northern Trunk Drain - Chinchilla	2025	\$ 992,087.04
D0071	Malduf Street Drainage - Chinchilla	2019	\$ 273,177.93
TOTAL			\$38,876,950.34

9.0 Source and supporting documents

A list of supporting information is provided in Table 9.1.

Table 9.1—Reference Documents

Document name	Document author	Version
Valuation of Western Downs Infrastructure Assets Roads Bridges Aerodromes and Storm water Revaluation of Non-Current Assets in Accordance with Australian Accounting Standards	APV Valuers and Asset Management	30 June 2012
Infrastructure Services Audit Committee Report 2014 Asset Management Annual Review	WDRC	June 2014
Wandoan Stormwater Drainage Concept Master Plan Report	Brandon & Associates Consulting Engineers	March 2004
Western Downs Flood Study (Various catchments) http://www.wdrc.qld.gov.au/2014-flood-study-reports	Water Technology	2014
Chinchilla Master Stormwater	WDRC	June 2015
Dalby Master Stormwater	WDRC	June 2015

