Water Services Development Plan

Chapter 5

Description of Existing Water Services Infrastructure

of

City of Cape Town

Status: Comprehensive WSDP

www.capetown.gov.za/water/wsdp

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List of Abbreviations

AADD	Annual Average daily demand
AFU	Automatic Flushing Urinal
CCT	City of Cape Town
CFA	Cape Flats Aquifer
CMA	Cape Metropolitan Area
CMC	Cape Metropolitan Council
DM	Demand Management
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
GLS	Geustyn Loubser Streicher Inc
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IMEP	Integrated Metropolitan Environmental Policy
IWRP	Integrated Water Resource Planning
MCDA	Multi-Criteria Decision Analysis
MNF	Minimum Night Flow
MLC	Metropolitan Local Council
PNE	Protected Natural Environment
PDG	Palmer Development Group
UAW	Unaccounted For Water
URV	Unit Reference Value
WC	Water Conservation
VIP	Ventilated Improved Pit Latrine
WDM	Water Demand Management
WSDP	Water Services Development Plan
WTW	Water Treatment Works
WWTW	Wastewater Treatment Works

Chapter 5

Description of Existing Water Services Infrastructure

5 Description of Existing Water Services Infrastructure

Issues:
- Updating of infrastructure database required;
- Limited information on internal wastewater systems;
- Asset Management Program (Inadequacy of current preventative maintenance/pipe replacement programs, including the rehabilitation of pitch fibre sewers.)

A summary of the existing water supply and wastewater infrastructure as well as the estimated replacement cost is provided in Table 5.1 (excl. consumer connections). For a full inventory of the main infrastructure refer to the infrastructure database **GO TO**. A detailed description of the bulk system and internal systems is not pertinent to the identification of issues and performance indicators and is therefore not described in detail. For further information refer to the various Master Plans and the studies on the bulk systems:
Bulk Water: "Computer Analysis and Master Plan for Bulk Water Supply System"
Bulk Wastewater: "Strategic Evaluation of Bulk Wastewater" (contact the former CMC Administration .)

Figure 5.1 and Figure 5.2 shows the main components of existing bulk water and bulk wastewater infrastructure in the City of Cape Town (CCT). The implementation of an Infrastructure Management Query Station (IMQS) is currently under consideration and will provide a basis for viewing details on the infrastructure as well as graphs and reports available from the master plans and related studies.

5.1 General Description of Existing Water Supply Infrastructure

The water supply infrastructure can be categorised into two groups, i.e. internal distribution systems, as previously administered by the former Metropolitan Local Councils, and bulk system as previously administrated by the Cape Metropolitan Council. The bulk water supply system is generally in good order with sufficient capacity to meet the required demand. Water gravitates from the majority of the dams, located mainly outside of the Cape Metropolitan area, via a number of large diameter pipelines to the water treatment works and bulk storage reservoirs from where water is distributed directly, but also via internal service reservoirs to consumers via bulk connections. A number of pumping stations are also required to boost supply in the higher lying areas.

For a more detailed description of the bulk water supply infrastructure refer to a document entitled "Bulk Water Supply Infrastructure" GO TO.

5.2 General Description of Existing Wastewater Infrastructure

The wastewater system, similar to the water system, consists of a bulk system and an internal system. Tygerberg Hill forms the watershed with wastewater draining towards the wastewater works many of which are located next to the coast. The drainage areas and the location of pumping stations and wastewater works are indicated on Figure 5.2. The Strategic Bulk Wastewater Study completed in June 1999, assessed performance of existing wastewater equipment, processes and management systems and identified where improvements are necessary for more effective performance. For a more detailed description of the bulk wastewater infrastructure refer to a document entitled "Bulk Wastewater Infrastructure" GO TO.

5.3 Asset Management

One of the important issues identified, as part of the WSDP is the lack of proper asset management programs, which could inevitably lead to the deterioration of infrastructure and service provision. It is therefore important that each department should draft an Asset Management Program and Plan. The overall condition of the water distribution pipe network has not yet been quantified on a Metro basis. This quantification is considered to be a task of immediate urgency. In some former MLC areas, conditions of networks are known and these records need to be amalgamated in order to focus expenditure. Some networks are showing signs of weakness that require addressing. Condition records of other networks are non-existent. It is proposed that meticulous records of burst mains, on a Metro basis, be introduced and maintained. Burst main incidents are proposed to be reported under the following topics:

- Street address of burst locality including locality sketch
- Pipe details (size, type, lining, sheathing etc.)
- Ground conditions
- Details of fracture

5.4 Stormwater Ingress into Sewers

Stormwater ingress into sewers is a major problem facing Water Services in the CCT. It reduces the conveyance capacity of sewer pipelines, as well as the capacity of the wastewater works to handle sewage flows. A distinction needs to be made between the following two types of stormwater ingress, namely:

- Stormwater Infiltration: This happens through cracks in the existing sewer pipes and require sealing or replacement. (The opposite to infiltration, namely exfiltration leads to pollution)
- Stormwater Influx: This is the illegal connection of stormwater pipes to the sewer systems. The solution to this problem is frequent inspections.

It is the intention of the CCT to initiate a study to determine the extent of the problem.

Table 5.1 Summary of Infrastructure Inventory and Estimated Replacement Cost at September 2001

Infrastructure	Internal Systems			Bulk Systems*			Total		
	No	Quantity	Replacement Value Rxmil	No	Quantity	Replacement Value Rxmil	No	Quantity	Replacement Value Rxmil
Water Supply Infrastructure									
Water Treatment (Ml/d)				13	1672	697	13	1672	697
Reservoirs (Ml)	109	984	372	22	2555	515	131	3539	887
Pump Stations (kW)	349	unknown	90	18	10940	144	367	unknown	234
Pipe Length (km)		8429	1998		629	3461		9058	5459
Major Storage Dams (mil m^3)				5	780	unknown	5	780	unknown
Sub Total			2461			4119			7277
Waste Water Infrastructure									
Water Care Works (Ml/d)				20	620	620	20	620	620
Pump Stations (kW)	293	190	293	27	unknown	243	320	190	536
Pipe Length (km)		8429	1998		120	500		8549	2498
Sub Total			2291			1363			3655
Total									10932

* previously administered by the CMC

Figure 5.1 Main Components of Existing Water Distribution System

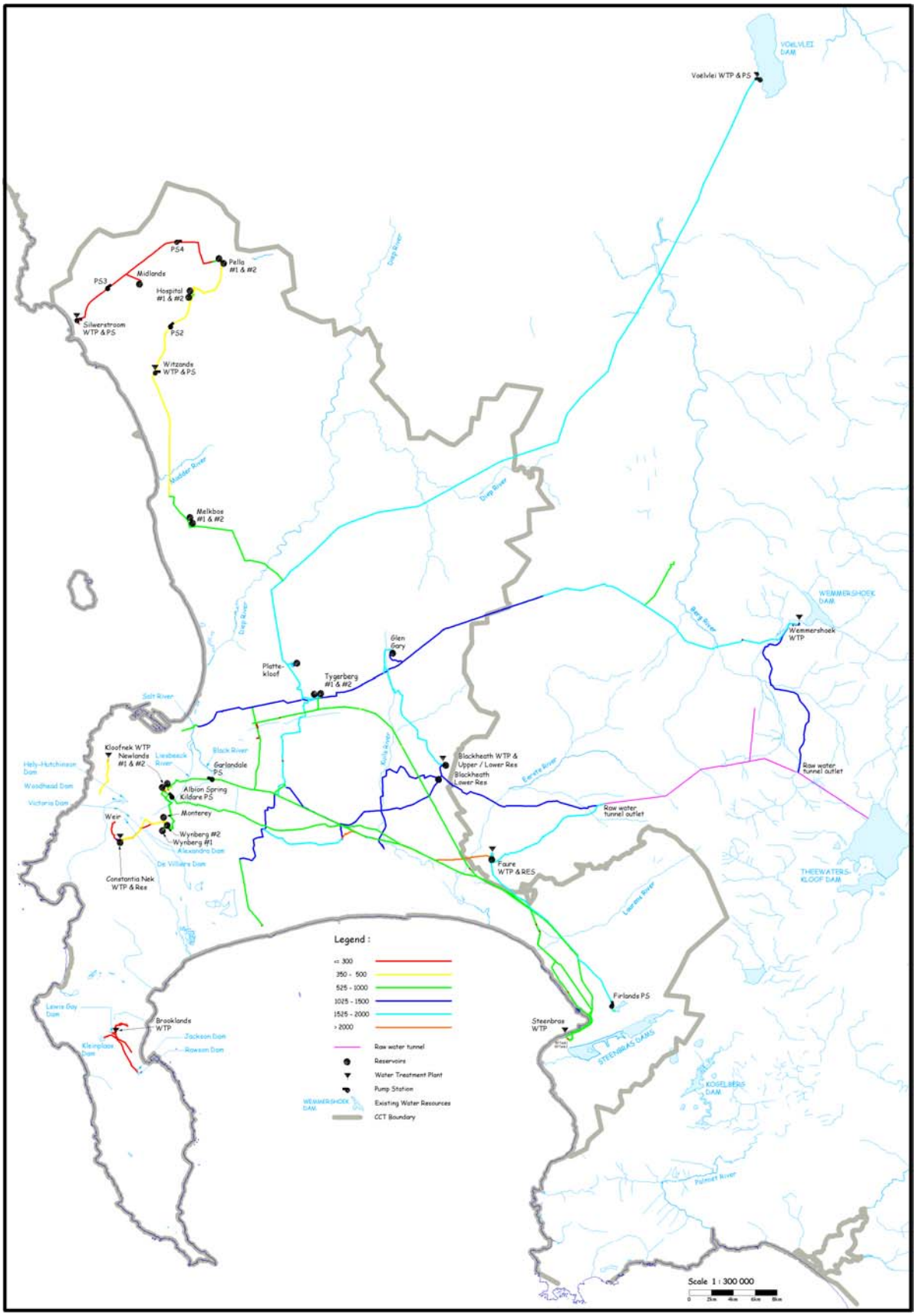

Figure 5.2 Wastewater Drainage Areas and Location of Treatment Works and Main Pumping Stations