

Integrated Water Resource Planning

With the realisation that water demand management was becoming increasingly important in order to ensure future sustainability and affordability, the City decided to adopt an integrated approach to water demand management and water augmentation. Towards the end of 1999, the City carried out an 'Integrated Water Resource Planning' (IWRP) study and 'Bulk Water Supply' study.

The aim of the studies was to investigate at prefeasibility level, various water demand management initiatives along with various water supply augmentation schemes.

The results indicated that a significant saving in water demand could be achieved through the implementation of certain water demand management initiatives. In comparison to the water supply options, certain water demand management initiatives would have a significantly lower implementation cost, could be implemented in a shorter time frame and were generally more environmentally and socially acceptable.

The IWRP study also recommended that the Voëlvlei Augmentation Scheme be the next scheme to be implemented after the Berg Water Project (BWP). In parallel to this it was recommended that a further feasibility study be carried out on the Table Mountain Group (TMG) Aquifer.

Water Demand Management

The IWRP study informed the Water Demand Management (WDM) policy and the WDM implementation strategy of the City of Cape Town, which was officially approved in September and October 2001 respectively.

The WDM policy is based on three broad principles, namely that water is a strategic, precious and scarce resource; that the wastage of water shall not be tolerated; and that all consumptive water use shall be measured and accounted for. The principle of measurement is critical to ensure that water is managed effectively as a strategic, precious and scarce resource. Long-term objectives set out in the policy include equity; sustainability; affordability; promotion and, where appropriate, legislate the optimal use of water; maximise the use of alternative sources; minimise the loss of water; and ensure wise use of water by the municipality. The WDM strategy has as its main objective a target to reduce the demand for water by 20% from the projected 'do nothing' scenario by the year 2010.



The Berg Water Project (previously Skuifraam Dam)

The Berg Water Project (BWP) has since 1995 undergone numerous studies by the Department of Water Affairs and Forestry (DWAF), including a feasibility study and an Environmental Impact Assessment. In May 1999, the national Department of Environmental Affairs and Tourism granted authorisation for the construction of the project in terms of the Environmental Conservation Act.

In April 2002 national Cabinet approved the implementation of the Berg Water Project and the Minister of DWAF issued a directive to the Trans-

Caledon Tunnel Authority (TCTA) to implement and fund the project. The project will be funded by water sales to the City of Cape Town.

The BWP which will be linked to the Western Cape Water System, can supply 81 000 MI of water annually. The cost of the BWP is estimated to be approximately R1,5 billion.



The TMG Aquifer

The City of Cape Town appointed the TMG Aquifer Alliance in April 2002 to carry out the feasibility study and pilot project. It is anticipated that the project will take approximately five to seven years. It is envisaged that this study and pilot project will enable the City to make an informed decision about the long-term sustainability, economic benefits and environmental impacts of the exploitation of the TMG Aquifer.

Timing of future water resource development schemes and WDM schemes

One of the major issues facing the City of Cape Town in the medium to long term is the limited nature of the available water resources and it is therefore important that the demand for water is managed in parallel to developing new water augmentation schemes. All the Western Cape Systems Analysis

(WCSA) shortlisted schemes as well as other schemes identified by DWAF and the City of Cape Town are currently in the process of being re-evaluated. Effluent reuse schemes are also becoming an important consideration. The schemes will have to go through an environmental impact assessment and some may have a limited yield or even be economically unviable.

WDM schemes which are currently being implemented are, inter alia, pressure control, user education and effluent reuse.

Assuming the City of Cape Town achieved its WDM objective, it is then anticipated that a new water resource, after the Berg Water Project, will only be required by the year 2012/2013. It is imperative, however, that planning commences at an early stage as the lead time to implement a water resource scheme is approximately six to seven years. This is why DWAF and the City of Cape Town are currently updating the WCSA. Impact such as global climate change and its effect on weather patterns may also influence the timing of the future schemes.

Desalination

Desalination as a possible water supply (resource) for the City of Cape Town was investigated at prefeasibility level as part of the 'Integrated Water Resource Planning' study.

Desalination is currently more expensive than a conventional water resource scheme. However, advances in desalination technology over the last decade have meant that the cost of desalination has decreased significantly. This could result in desalination being implemented prior to some of the above-mentioned conventional water resource schemes.

This is why the City has taken a decision to implement a pilot project in order to explore the future potential for the City.

References:

- Water Services Development Plan, June 2002
- Integrated Water Resource Planning study, 2001
- Bulk Water Supply study, 2001
- Water Demand Management Policy, 2001



CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

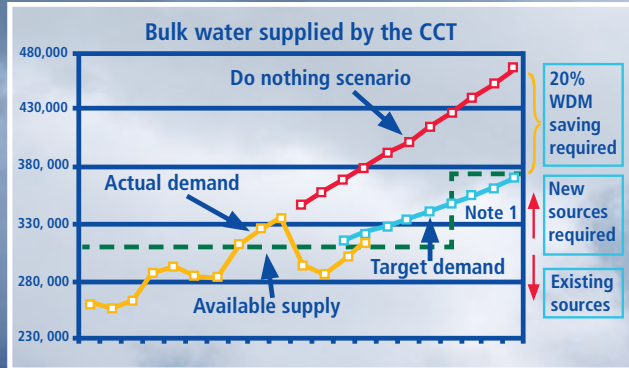
THIS CITY WORKS FOR YOU

Saving water is a way of life

Where does our water come from?



Save our water.
Save our City.



Brief history

Water is a scarce resource in the Western Cape, and historically there have been periods of water restrictions followed by the development of new water augmentation schemes. Up until the mid 1990's the approach to water supply was very much supply-orientated with new water augmentation schemes being developed to meet the growth in water demand.

Water supplies for the local inhabitants and the travellers around the Cape originally came from the streams and numerous springs to be found below Table Mountain. The first recorded drought was as early as the summer of 1663 when there was no water to supply the ships. By 1806 the population had grown to over 17 000 and the extravagant use (wastage) and pollution were causing distress and sickness. Water-loss control measures were introduced to curb losses. This involved the replacement of leaky wooden pipes with cast-iron pipes from England and replacing many of the fountains around the City with hand pumps (swaaipompe). One example still exists in Prins Street, Gardens. Rapid development and expansion of the City continued after the turn of the century and this placed a great strain on the water supply. Woodhead and Hely Hutchinson Dams were built in the Cape Peninsula



mountain range around the turn of the 20th Century. In spite of the two dams on Table Mountain, water rationing was again imposed during the summer months in 1904. It took a dam on the Steenbras River (completed in 1921), a tunnel through the Hottentots Holland mountains, and a 64 km long pipeline to the Molteno Reservoir, to solve the immediate problems. After the Second World War, the demand for water rapidly outstripped the supply and the Steenbras Dam was raised in 1928 and additional pipelines to Cape Town laid. By that time the demand for water was again outstripping the available supply and a third pipeline from Steenbras together with a water treatment plant was completed in 1949 (this was the first time the brown colour was removed from the water). This was followed by a further raising of the Steenbras Dam in 1954.

The City also embarked on the Wemmershoek Water Augmentation Scheme in 1953. This comprised of a large earth dam on the Wemmers River, a treatment works and an 80 kilometre long pipeline to a reservoir on the Tygerberg. A further period of restrictions preceded the construction of the Wemmershoek Dam which was completed in 1957.

The next augmentation of the City's supplies came as a 66 400 megalitres per year allocation from the Voëlvllei Government Water Scheme. The Council's works, comprising intake works, treatment plant, pumping stations and an 80 kilometre long pipeline 1 500 mm in diameter, was completed in 1971.

Next came the Riviersonderend Water Augmentation Scheme, undertaken jointly by the then Department of Water Affairs (DWAF) and the Cape Town City Council. The construction of the Theewaterskloof Dam situated on the Riviersonderend near Villiersdorp and the 35 kilometres of tunnels was carried out by DWAF. The City constructed the Blackheath Water Treatment



Plant (WTP) (400 MI/d) and associated pipelines and service reservoirs required to supply metropolitan Cape Town. In addition to this a pipeline was laid linking Theewaterskloof Dam to the

Wemmershoek WTP through a 1 100 mm diameter pipeline. Continuous assessment and planning indicated a further need for augmentation by the summer of 1993 and the Riviersonderend/ Palmiet River Water Augmentation Scheme, which comprised a WTP at Faure (500 MI/d), a 640 MI reservoir and 22,6 km of pipeline. The last major augmentation scheme to be constructed was the Palmiet Scheme which linked the Palmiet River to the Faure WTP via two pumped storage schemes (Eskom's Palmiet Pumped Storage Scheme and the City of Cape town's Steenbras Pumped Storage Scheme).

In 2002 the Minister of Water Affairs and Forestry declared that he was satisfied with the progress the City had made with respect to the implementation of water demand management. The Minister took the decision to proceed with the implementation of the Berg Water Project on the condition that the City continue to implement Water Demand Management as a parallel process.

Current resources and water demand

Potable water is supplied to approximately 3,2 million people within the Cape Metropolitan Area and bulk potable water to both the Drakenstein (Paarl and Wellington) and Stellenbosch Municipalities. The dams supplying water are the Table Mountain Dams (3 500), Steenbras Upper and Lower Dams (40 000), Wemmershoek Dam (54 000), Voëlvllei Dam (70 400) and the Theewaterskloof Dam (118 000). Water is also abstracted from Albion Springs (1 500) and the Atlantis Aquifer (5 000). The figures in brackets indicate the City's registered water use for the various sources. The water treatment plant capacity is approximately 1500 MI/d and bulk water reservoir storage capacity is approximately 2 500 MI. Treated effluent is reused for industry and irrigation.

Currently approximately 6% to 12% of treated effluent is recycled to industry, sportsfields, schools and golf courses. The average current water demand in the 2003/2004 financial year was 865 MI/d.

The Western Cape Systems Analysis

In April 1989, the Department of Water Affairs and Forestry and the then Cape Town City Council initiated a study to determine available water resources (including desalination) within the South-Western Cape and to compare them on a unit cost basis. This study was called the Western Cape Systems Analysis (WCSA).

In 1996 the options identified by the WCSA underwent a process of public participation. As a result, twelve schemes were identified for further study.

They were: Water Demand Management, Alien Vegetation Clearance, Mitchells Pass Diversion, Eerste River Diversion, Voëlvllei/Lorelei 1, Lourens River Diversion, Cape Flats Aquifer, Skuifraam Dam, Skuifraam Supplement, Direct Reuse of Sewage Effluent, Sewage Effluent Exchange and Desalination.

Prefeasibility studies or feasibility studies have been carried out on all of the above-mentioned schemes either by DWAF or the City of Cape Town. It was decided by DWAF to proceed with the development of the Berg Water Project (Skuifraam Dam and Skuifraam Supplement Scheme) first as the Berg River Dam added additional storage to the Western Cape Water System and is a cost-effective scheme.

Saving water is a way of life