

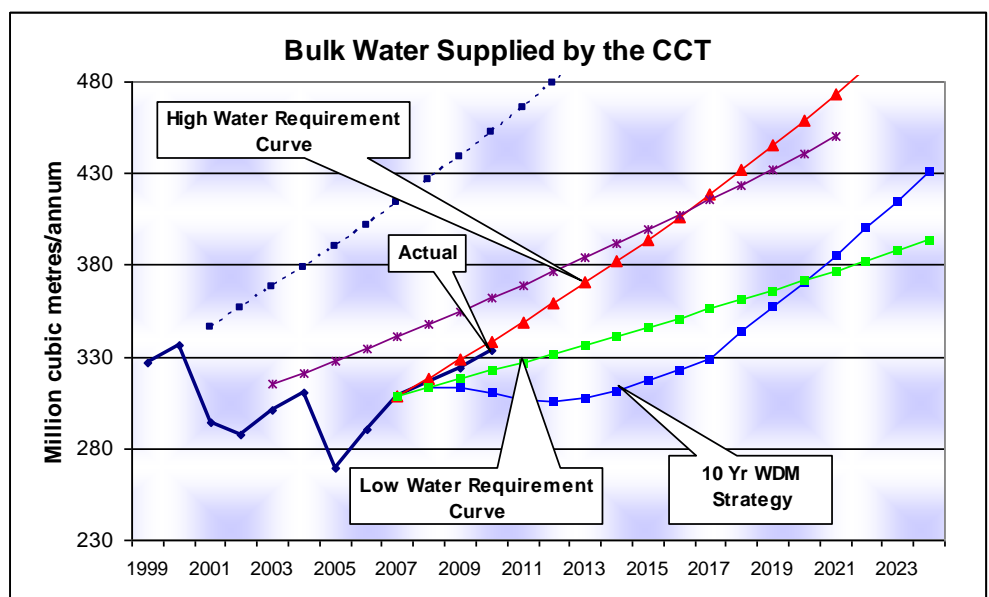
Cape Town's water projections exceed expectations

In the past, various interventions were implemented to curb the volume of water required by the people in Cape Town. Droughts, water restrictions etc. all played a role in reducing water demand since the year 2000. This meant that Cape Town would still be able to rely on its existing water resources for quite some years.

To lengthen this period of grace, the City of Cape Town (CCT) introduced a 10-year Water Conservation / Water Demand Management (WC/WDM) Strategy, targeting a saving of approximately 90 million m³ by 2016/2017. This would reduce the growth in water requirements, meaning that the current resources in the system would be able to meet the requirements until about 2019, when a new source of water for the City would be needed. As it takes a number of years to investigate, evaluate the feasibility, get all the legally required approvals and build a new water supply scheme, this lead time is extremely important for planning purposes.

In March 2010, during a meeting of the Strategy Steering Committee (SSC) representing all role-players involved in water-related aspects in and around Cape Town, it became clear that the CCT may NOT be able to meet the required decrease in water required. Although the reasons for this are being investigated at the moment, there is a

concern about CCT's water requirements which are following the high water requirement curve (refer to the graph below). Should this growth continue, the decision on which augmentation intervention earlier to proceed with, will have to be made in September 2012. Possible water supply options may need to be fast-tracked, providing challenges to planners and financial implications to water users. *(Please read the back page for another possible explanation for the 2% increase.)*



Keeping the water flowing...



A lovely stream... but the invasive alien trees on the river banks take up much of the water that could be used to adhere to the ecological flow requirements of the river

Mountain catchments covered in fynbos have in the past never been clearly 'labelled' as an intervention that could provide more water to the Western Cape Water Supply System (WCWSS). The clearing of invasive alien vegetation from especially mountain catchment areas, is, however, an important part of managing the water resources in the system in an integrated manner and securing more water for human consumption and the ecology.

Studies done by CapeNature in Jonkershoek have clearly shown an increase in water flowing in mountain streams once these over-abundant (invasive) water users have been removed and the natural fynbos has been restored. In the light of potential climate change, water runoff could become more and more under stress to fill our dams and keep our rivers flowing – hence the clearing of invasive alien vegetation in mountain catchments and along riparian areas is becoming more and more important.

Although the infestation of invasive alien vegetation in the mountain catchment areas of the dams in the Berg Water Management Area is relatively low, the



Most of the mountain catchments upstream of the dams are clear of invasive vegetation. This status quo must be kept, and must be expanded to keep the mountain catchments of all streams clear of invasive vegetation

impact of NOT keeping these areas pristine could have a detrimental effect on the yield of the WCWSS. As a large volume of the WCWSS's water is obtained from the Breede-Overberg area (mainly via the Palmiet River and the Theewaterskloof Dam), it is important that the catchment areas of these water resources be kept clear of invasive alien vegetation.

The serious infestation of the riparian areas of the Riviersonderend downstream of the Theewaterskloof Dam is another concern, as the clearing of invasive species along the river bank could make more water available in the river; thus providing more water for the ecological Reserve which would otherwise have to be released from Theewaterskloof dam. This would mean less water available for the WCWSS – an excellent illustration of integrated water resource management (i.e. one cannot manage water without considering every other aspect and resource that is part thereof and/or interconnected to it).

Climate change under the spotlight

Climate change projections for the Western Cape indicate a potential drying trend from west to east; a weakening summer rainfall – with possible increased summer rainfall (mainly in the east); a shift to more irregular rainfall of possibly greater intensity; and rising summer temperatures across the region.

A task team has been established by the SSC to determine the resilience of the WCWSS against scenarios such as "Can we cope with longer or more severe droughts?"; "What will the effect of more veld fires, less cold units, more intense rainfall be"; and "What effect will seasonal change or variability have on water use?". This team will report to the SSC every September, and indicate how these trends have been incorporated into the scenario planning process.

DWA and CCT abreast of finding additional water resources

Both the Department of Water Affairs (DWA) and the City of Cape Town (CCT) have been investigating various water resources that could possibly be developed to augment the water supply to the Western Cape Water Supply System (WCWSS). Many options may seem to be feasible, but only proper investigation into their long-term feasibility and the effect it will have on the environment (along with the cost implication thereof) will determine the most viable options that could be developed.

This research into the most appropriate option for water supply is called a feasibility study. As this type of study is quite a time-consuming and expensive exercise, careful consideration has to be given to those options that seem to have the best socio-economic benefit with the least biophysical impact.

Water Affairs options

Since 2007 the DWA has been looking at various surface water options to augment the WCWSS – from towing icebergs to building more dams. The various options have over the past three years been screened out until the following four surface water interventions were identified (and agreed upon at a technical prioritisation workshop held on 25 March 2010) as being the most appropriate to pursue to full feasibility study level:

- **Voëlvlei Phase 1:**

Pumping surplus winter water from the Berg River to the existing Voëlvlei water purification works.

- **Raising of Voëlvlei Dam**

Increasing the capacity of the Voëlvlei Dam by raising the dam wall and pumping surplus winter water from the Berg River to the dam.

- **Michell's Pass Diversion,**

Diverting water during winter from a weir on the Upper Breede River into a canal, across the watershed to a tributary of the Klein Berg River, from where it is diverted to Voëlvlei Dam.

- **Raising Lower Steenbras Dam**

Raising the Lower Steenbras Dam to maximise abstraction from the Palmiet River by means of Eskom's Pumped Storage Scheme.

The DWA also looked into the possibility of recharging the West Coast Aquifer, but a study completed last year indicated that the aquifer was punctured due to indiscriminate drilling by private contractors in the past. Other methods to recharge this aquifer are currently being investigated, but the environmental impacts thereof need to be determined first.

A recently completed study indicated that water availability in the WCWSS is still the same as determined in earlier analyses, but that there are shifts in the yields of the different dams, which are very important to take into consideration in the operating of the system. Most

significant is the decrease in the combined yield from the Voëlvlei and Berg River Dams, which is fortunately counteracted by an increase in the yield from Theewaterskloof Dam.

City of Cape Town's options

CCT is seriously looking into the potential of re-using water that is at present discharged to the rivers or oceans. A desktop study completed earlier this year revealed that the planned indirect method (treating water from wastewater treatment works to a suitable standard and then discharging it into a water body where it mixes with the natural inflow, where after this 'raw water' is treated in the normal way to potable standards) would most probably be more acceptable. This method is, in fact, already being practiced in larger river systems throughout the country where treated water from wastewater treatment works is discharged into a river and is then abstracted further downstream by another municipality as 'raw water'. A service provider to investigate the various options will be appointed during the course of 2010.

It is also the CCT's intent to commission a feasibility study for the large scale abstraction of seawater and the implementation of a pilot desalination plant by end 2010, subject to the Mayoral Committee's approval.

The Table Mountain Group (TMG) Aquifer has been identified as a potentially significant groundwater resource. The CCT started an exploratory drilling programme in 2008 and the geological and hydrogeological information from the core drilling during this phase is being analysed at present. The report is expected by end July 2010, where after the CCT will request the Mayoral Committee's permission to proceed to a pilot well-field (possibly close to Theewaterskloof Dam) and to determine the feasibility of the TMG groundwater resource for large-scale development.

What is the SSC?

The Strategy Steering Committee (SSC) was established in 2007 and is responsible for ensuring the implementation of the Reconciliation Strategy (see box to the right) and to make strategic recommendations on interventions required. It consists of representatives of all government departments whose planning depends on the availability of water, as well as all municipalities who receive their water from the WCWSS, as well as organised agriculture.

It is administered by the national Department of Water Affairs, supported by the Western Cape regional office. Provincial departments and statutory organisations who serve on the SSC are:

- Department of Agriculture
- Department of Environmental Affairs and Development Planning;
- Department of Local Government and Housing, and
- CapeNature.

Apart from the City of Cape Town, the following municipalities who supply water via the WCWSS are members of the SSC: Stellenbosch, Drakenstein and Witzenberg Local Authorities; and the West Coast and Cape Winelands District Municipalities. The Breede-Overberg Catchment Management Agency (from where a substantial volume of water is already transferred to the WCWSS) is also a member. The water user associations in the Berg and the Breede Water Management Areas are also represented on the SSC.

The SSC meets twice a year – during March when the progress with water demand management and the current studies are discussed, and in September when detailed attention is given to scenario planning based on actual water requirement during the previous year.

What is the WCWSS?

The Western Cape Water Supply System (WCWSS) is an intricate system of dams, pipelines and tunnels which is cooperatively managed by the DWA's Regional Office in Bellville and the CCT. The underlying principle is to optimise available water resources by drawing preferentially from dams that might spill, thus ensuring that sufficient water is available for all users during periods when water requirements are high (summer) and/or droughts.

The WCWSS serves more than 3 million people and provides water to the communities residing in the City of Cape Town (CCT) and in certain Overberg, Boland, West Coast and Swartland towns, to irrigators along the Berg, Eerste and Riviersonderend Rivers, and to rural and stock-watering schemes in the West Coast, Swartland and Overberg areas. The main storage dams of the WCWSS are the Theewaterskloof, Voëlvlei, Berg River, Wemmershoek, Upper Steenbras and Lower Steenbras Dams.

The increase in the water requirements of the area is driven by population and economic growth within all sectors. This necessitated the development of a strategy that could be used as a support framework for making timeous and informed decisions on those interventions that should be implemented to meet the future water requirements. The Strategy Steering Committee ensures that the strategy is implemented, updated and being adhered to, and makes strategic recommendations to the relevant authorities.

CCT to decrease its unaccounted for water loss to 15% by 2016

One of the reasons for the growth in water requirement could be the CCT's difficulty in effectively addressing 'unaccounted for' water losses because of insufficient funding. It is expected that the funds available for the 2010/11 financial year will decrease water lost because of pipe bursts and leaks by 0.4%; and water lost due to inefficient metering by 1% – achieving a direct saving of 1.4%. With other interventions such as the WC/WDM programme, a 2% saving could be achieved, bringing the growth in water requirement back to 0% per annum.

The CCT is also targeting to reduce the 'unaccounted for' water loss to 20% in the 2010/11 financial year – and eventually to 15% by the year 2015/16. Almost two-thirds of the present 'unaccounted for' water is attributed to water that is used but not metered (mainly standpipes) whilst the remainder is water that is actually lost to the system because of technical problems (burst mains and meter leaks).