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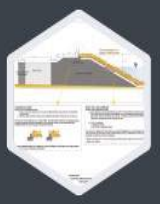
Solving Cape Town's Water Crisis — Vanderkloof Dam-Voëlvlei Dam Pipeline

Given the increasing water shortage in Cape Town and adjacent areas, the almost depleted surface water resources, climate change, population growth, and the environmental & social impacts of sourcing from alternative resources (groundwater, desalination, etc.), all possible options should be evaluated in order to provide a long term and sustainable solution, or combination of solutions. With the exception of desalination, all the currently considered solutions are still reliant on rain within the Western Cape, so they remain risky options for sustainable future supply. For instance, should there be prolonged drought, groundwater would also run out and there would not be enough water to reuse from wastewater or storm water.

Therefore, a better solution would be to **source water from another climatic region** (summer rainfall area), and due its size and current use, the Vanderkloof Dam would be the best option to augment water supplies to Cape Town. This would entail the construction of a pipeline to transfer water from the Vanderkloof Dam to the Voëlvlei Dam along a route in the Western Cape (e.g. Beaufort West, Laingsburg, and particularly Cape Town).

Background Facts on the Vanderkloof Dam:

- The Vanderkloof Dam (Orange River) is the 2nd largest dam in South Africa.
- Capacity: 3187.5 million m^3
- The Vanderkloof Dam is augmented by the largest dam in South Africa, the Gariep Dam, 50 km upstream in the Orange River, with a capacity of 5343 million m^3 (> 11 times the capacity of the Theëwaterskloof Dam).
- These dams are in the summer rainfall area. During winter (low rainfall) the effect of abstraction to the Western Cape will be limited.
- **50% of its capacity can supply 29 million people for one year** at a consumption of 150 litre/person/day.
- Capacity compared to Theëwaterskloof Dam: 6.6 x larger
- Capacity compared to Voëlvlei Dam: 19 x larger
- Capacity compared to Bergrivier Dam: 25 x larger
- Capacity compared to Wemmershoek Dam: 55 x larger
- Difference in elevation between Theëwaterskloof Dam: > 1000 m
- Distance between Voëlvlei Dam and Vanderkloof as the crow flies: 700 km
- ***Present inflow to Vanderkloof (13/10/2017) is > 60 cumec (or 6.9 million m3/day) which is > 10 times the current daily target of Cape Town (500 000 m^3)***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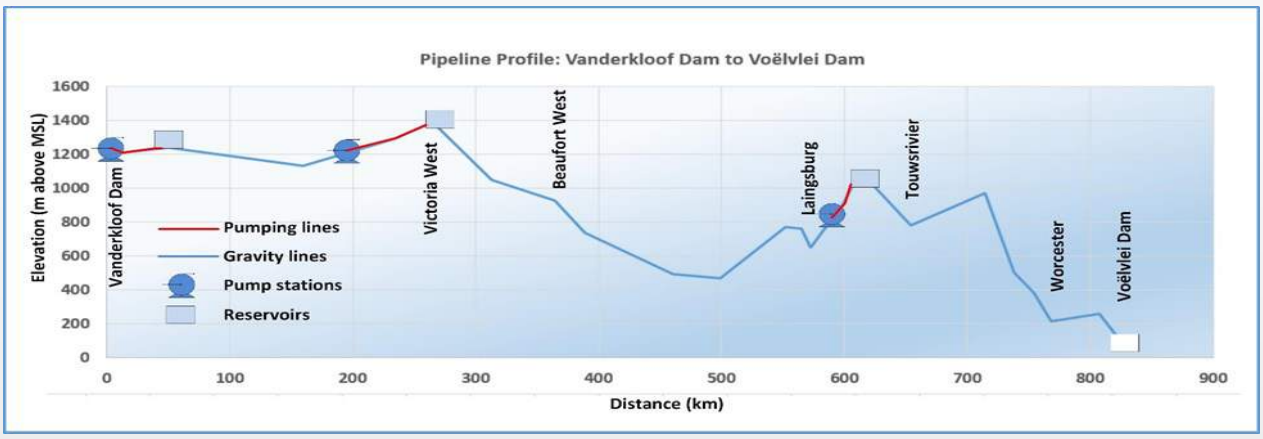


Project Benefits

- Abstraction of **400 million litre/day for one month is < 0.4% of the total capacity of the Vanderkloof** Dam.
- **Environmental impact is limited to the construction period** (temporary) given that most of the line existing servitudes for roads or power lines can be followed. Environmental impact is insignificant when compared to alternative new resources (groundwater extraction, new dams or brine discharges to the surf zone).
- **No new process plants (treatment or desalination) are required**.
- **Immediate and long term solutions to frequently drought stricken Karoo towns** (e.g. Victoria West, Beaufort West, Laingsburg, etc.).
- **Cost: Preliminary estimates for capital cost: < 50% of estimated cost for desalination plants**, while **operating costs will be far less**
- **Energy generation in the form of hydro-electricity** is a strong possibility along various parts of the pipeline which could eliminate operating costs and provide surplus energy to needy areas along the route.

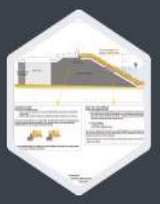
Conclusion

Compared to a very costly solution such as desalination — a pipeline such as this would be a cheaper and more environmentally friendly solution. It would save the Western Cape tax payers billions of Rands and provide cheaper drinking water in future. Operations and maintenance of water infrastructure in South Africa is currently a huge challenge, but this would be limited for this pipeline project compared to other proposed options such as waste water treatment to potable standards and seawater desalination.

Many examples exist all over the world of water being transferred over long distances between different climatic regions in order to supply highly populated areas with water, e.g.: The Chinese government is building a South-North Water Transfer Project: 1,264 km long, initially providing 9.5 km^3 of water annually; Libya's Great Man-Made River (GMMR): up to 1,600 kilometres — the GMMR currently provides 70% of all freshwater used in Libya; The Goldfields Water Supply Scheme is a pipeline and dam project in Western Australia 530 kilometres; etc.

This should not be a difficult project to accomplish—all that is needed is political will.

For more information on the proposed project—visit https://www.wamsys.co.za/pages/water-library.php
Contact us: 021 887 7161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