DASPOORT – Still performing after a century

Pretoria's Daspoort Wastewater Treatment Works might have infrastructure built nearly a century ago, but this has not prevented it from still providing a crucial service to the city. Compiled by Lani van Vuuren.

South Africa's administrative capital, the City of Pretoria was founded in 1855. The town came to prominence in 1852 when it was sited as the capital of the former Transvaal Republic, succeeding Potchefstroom in that role. Almost immediately it became a centre of government, and retained that function through to 1910 when it was formally declared the administrative capital of the Union of South Africa.

By 1904, the population of Pretoria had reached nearly 40 000. At this time, town engineer HD Babcock submitted the first plans for a sewerage system to the Town Council. His plans included a watercare works. His proposals were not fully accepted. The Daspoort Wastewater Treatment Works was eventually built between 1913 and 1920 to the design of Town Engineer F Walton Jameson (nicknamed 'Jacaranda Jim' for his introduction of the trees to Pretoria). Constructed on the southern banks of the Apies River, the plant is situated adjacent to the central business district, and today is one of ten sewage treatment plants serving the residents of Pretoria.

Wastewater from the central Pretoria area is collected in a main outfall sewer that runs alongside the Apies River past the Daspoort wastewater treatment works to the Rooiwal wastewater treatment works. The first works at Daspoort comprised screens, grit removal channels, primary sedimentation tanks (Dortmund tanks), 16 biological filtration units, and separate sludge digestion in rectangular tanks. Sixteen biological filters were constructed to form four units of four biological filters each. The design capacity was two mega-gallons per day (equivalent to 9 Mℓ/day).

The performance of these biological filters today, after nearly 90 years of service is a fitting tribute to a great South African pioneer in the science of wastewater treatment. Jameson was also responsible for the appointment in 1920 of the first chemist as manager of a watercare works in South Africa, namely Mr M Lundie.

Right: *An old church at the works site is all that remains of the original community that was relocated to make way for the Daspoort plant in 1913.*

Below: *The original biological filtration units are still in use.*

Opposite page: *The final effluent before being released into the Apies River. Much water is also used at the works to irrigate the lawns etc.*

All photographs by Lani van Vuuren

Scarcely ten years later, the four units proved inadequate to treat the waste load. By 1933, the wastewater flow average 9 Mℓ/day. The establishment of ISCOR in that year necessitated the laying of a separate sewer from the west and two biological filters were erected with a design capacity of one mega gallon a day (4,5 Mℓ/day), as well as four 12-metre diameter sludge digesters.

In 1945, following the Second World War, two more biological filters were constructed with a total capacity of two gallons per day (9 Mℓ/day), and the last biological filter was built in 1947 to bring the total designed treatment capacity to six mega gallons per day (27,5 Mℓ/day). With this last biological filter, two 27 m diameter Dorr digesters were also constructed, bringing the total digestion capacity up to 12 000 m^3.

Daspoort supplied cooling water to the Pretoria West power station from 1952. For supplying the cooling water, extra humus tanks, a balancing tank, collecting tank, five rapid gravity sand filters for 12 Mℓ/day and a pump station were added at a cost of about R240 000.

For the next 20 years, no further extensions were made at Daspoort except to the sand filters and the balancing dams, but the Rooiwal Wastewater Treatment Works was built to treat the constantly increasing wastewater flow from the city.

Between 1973 and 1976 the biological treatment capacity at the Daspoort WWTW was increased from 27 Mℓ/day to 64 Mℓ/day. The activated sludge reactor which was then constructed, included screening, grit removal tanks, primary settling tanks (Dortmund), activated sludge aeration by 27 mechanical surface aerators in nine aeration tanks, and secondary settlement in six flat-bottom tanks with mechanical scraping and hydraulic suction lift of the activated sludge. This wastewater treatment works was then designed to produce an effluent conforming to the General Standard without tertiary treatment.

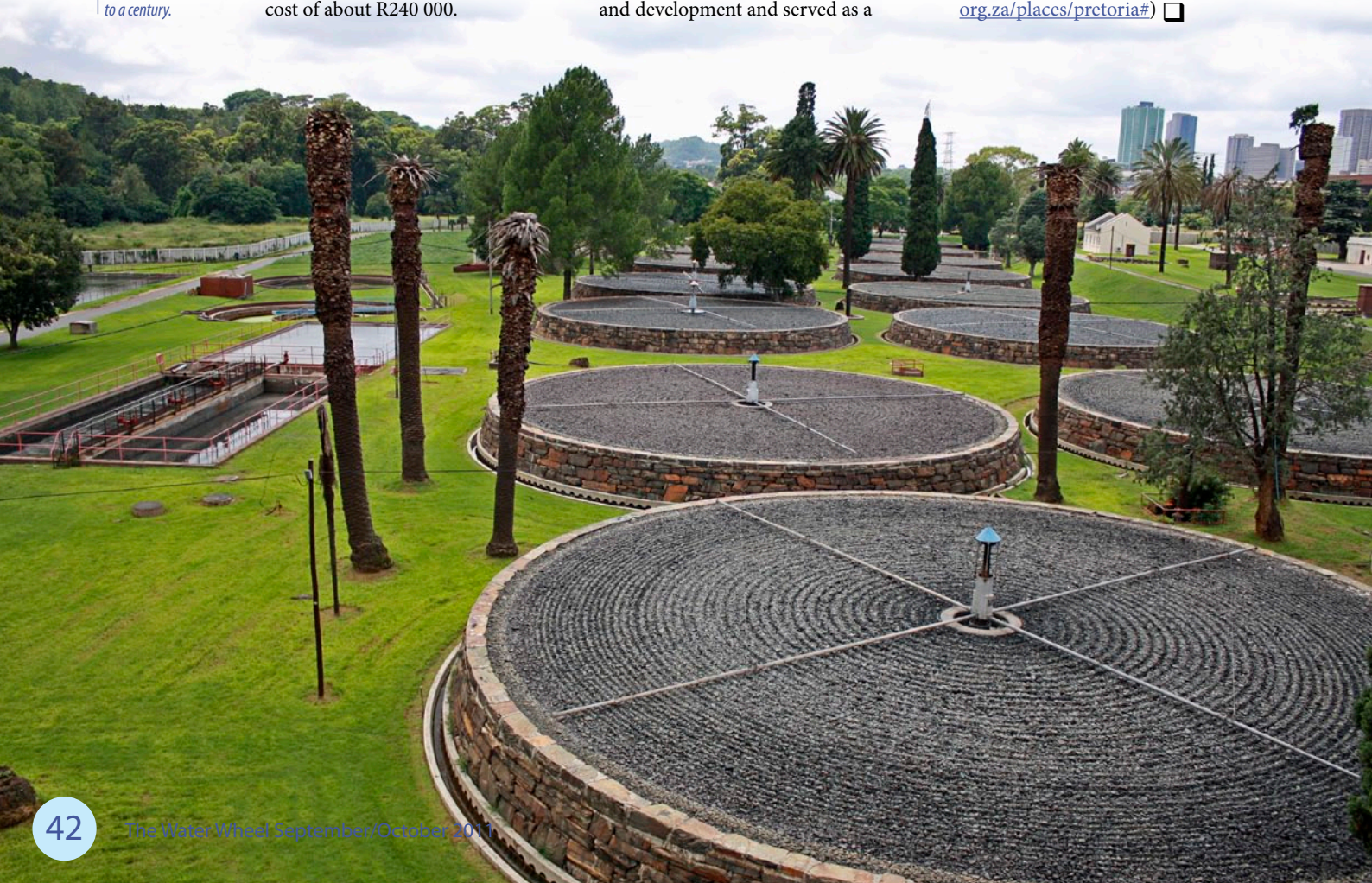
In the 1970s the Water Research Commission ran the Stander Water Reclamation Plant at Daspoort. The plant, which had a capacity of 4,5 Mℓ/day, was used for research and development and served as a prototype for large-scale water reclamation processes.

Following the publication of the Special Standard for Phosphate in 1984, one of the three activated sludge reactors was retrofitted in 1986. After successful retrofitting, it took nine years to retrofit the other two activated sludge reactors. This work was finally completed in 1995. Since that time Daspoort has mostly complied with the phosphate standard. In 1997, the first ultraviolet (UV) light disinfection of wastewater plant in South Africa was commissioned successfully at Daspoort.

The plant has a current capacity of 55 Mℓ/day. In 2009, Daspoort became one of the few wastewater treatment plants nationally to obtain a Green Drop (unfortunately it lost its status in the latest round of assessment). Still, after nearly a century of operation, the works is still providing a valuable service to one of the country's largest cities.

- Thanks to Kerneels Esterhuyse for information (additional source: www.sahistory.org.za/places/pretoria#) ❑

The Daspoort Wastewater Treatment Works has served the City of Pretoria for close to a century.



CIGB ICOLD

SANCOLD

South African National Committee on Large Dams Biennial Conference

MANAGEMENT AND DESIGN OF DAMS IN AFRICA

8-10 November 2011

About the conference

The South African National Committee on Large Dams (SANCOLD) conference will be held at the Gallagher Convention Centre in Midrand, between Tuesday 8 and Thursday 10 November, 2011.
SANCOLD invites all from Africa and the wider family of ICOLD to participate in the conference, which will include technical presentations, a technical visit and an exhibition.
This is an ECSA Continuing Professional Development (CPD) accredited event. This Conference is a Category 1 activity and offers 3.0 credits.

Conference Topics

- Reservoir management (flood control, warning and routing, sedimentation, water quality, IFRs and environmental flood releases, etc.)
- Dam safety and dam surveillance
- Dam rehabilitation
- Hydropower schemes
- Water resources management and water quality (acid mine drainage, etc)
- New dams versus desalination schemes
- Site selection: geotechnical and environmental aspects
- Dam types and construction material
- Spillway, energy dissipation, outlet designs and operation

Programme overview

The conference will commence on Tuesday morning 8 November. On Tuesday there will be presentations by keynote presenters and of technical papers. The conference dinner will be held on the Tuesday evening. Technical visits to the Bospoort and Rust de Winter dams have been arranged for Wednesday 9 November. There will be further presentations of technical papers on Thursday with the Conference concluding in the afternoon.

Registration

Conference registration is now open. The registration and payment deadline is **10 October 2011**.
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