

Characterised as a semi-arid country, South Africa is extremely dependent on its dams for water supply. South African dam builders have mastered the art and science of manipulating water flows to allow the country to unlock its economic potential.

At last count the country had a total mean annual runoff of only 49 210 million m³/year. Of this volume, around 70% is stored behind the country's 252 largest dams. The country's bulk water supply infrastructure is integrated and sophisticated, often involving numerous large dams, pipelines, pumps and water transfer schemes from water-abundant to water-scarce catchments.

Ensuring the integrity of this infrastructure is extremely important, especially considering the fact that most of the country's larger dams are now older than 30 years. The DWS Dam Safety Office was originally established in 1986 as a technical unit to support the implementation of dam safety legislation.

Registration of dams with a safety risk

Not all dams in South Africa are registered with the Dam Safety Office. Only dams with a considered safety risk need to be registered. These are dams with a wall height exceeding 5 m and a storage capacity greater than 50 000 m³. Every dam with a safety risk must be classified as a Category I, II or III dam (with I being the lowest risk and III being the highest risk). This is done on the basis of the dam's size and its hazard potential rating. Only 6% of South African dams have a Category III rating.

No person who intends to construct a new dam with a safety risk, or enlarge, alter or repair an existing dam with a safety risk, may begin construction work before he or she is in possession of a licence to do so. The Dam Safety Office considers and issues between 20 and 30 licences a year.

All new dams also require a water use licence for the water use activity to store water, as well as an environmental authorisation.

Who owns the dams in South Africa?

The DWS dams database contains information

on each dam with a safety risk. For each dam the following information is recorded:

- The coordinates of the dam (latitude and longitude)
- The name and contact details of the owner
- Capacity, maximum wall height and classification.

The database is integrated into DWS Geographical Information System (GIS) tools so that the Dam Safety Office can see the position of any dam on a computer screen on a 1:50 000 map and on satellite images in different years. Google Earth is also used.

At present, the office has 5 102 dams registered on its database. Of these dams, 75% or 3 832 are small (less than 12 m). Only 3.5% of dams on the register are larger than 30 m. Further, it is interesting to note that the vast majority of dams on the register are located in the Western Cape (1 444), followed by KwaZulu-Natal (986), and Mpumalanga (507). As expected the arid Northern Cape has the least number of dams on the register – only 2% or 82.

Since most of the water in South African dams is used for agriculture it stands to reason that this sector owns the most of the dams on the Dam Safety Register (a total of 4 001 or 80%). Interestingly, the mines & industry sector owns slightly more dams than does the DWS, 337 compared to 324 owned by the department. The department does own the largest dams in South Africa, however. South African municipalities own a further 321 dams, with the remainder of dams being owned by other government departments and water boards.

New dam safety regulations

Dam safety legislation was first implemented in South Africa in 1987, under the old Water Act of 1956. When this Act was replaced with the new National Water Act in 1998, this legislation had to be renewed. The new dam safety regulations were published in 2012.

The purpose of dam safety legislation was, and still is, to improve the safety of new and existing dams with a safety risk so as to reduce the potential for harm to the public, damage to property or to the quality of water resources. The

biggest change to the legislation has been that in addition to protecting human lives and property against unsafe conditions at dams, the new Regulations have been expanded to also protect water resources by assigning a high priority to e.g. pollution control dams, which have an impact on groundwater and surface water resources. These dams occur mostly in the mining, industrial and municipal sectors.

Category II and III dams must be inspected every five to ten years. This, and other dam safety-related work, must be done by approved professional persons or APPs. These are people registered as professional engineers, technologists or technicians who have the approval to perform certain dam safety tasks. Approvals are undertaken in consultation with the Engineering Council of South Africa (ECSA). The new Regulations saw the establishment of a register of APPs, which makes it easier for dam owners to find person(s) with the necessary qualifications.

DWS dam safety rehabilitation programme

In addition to the inspection of dams, the DWS has also been undertaking a major rehabilitation programme on its own dams. Over the last six years, the department spent between R385-million and R228-million on rehabilitating dams. Around 50% of dams earmarked for major rehabilitation work have now been completed.



Nqweba Dam owned by Camdeboo Municipality is one of the municipal dams on the Dam Safety Register.

Table 1: Distribution of registered dams according to size class

Size class	Number	%
Small (less than 12 m)	3 832	75,1%
Medium (12 m to 30 m)	1 093	21,4%
Large (30 m and higher)	177	3,5%
Total	5 102	100

Source: DWS

Table 2: Distribution of type of ownership of registered dams

Ownership sector	Total number of registered dams
Agriculture	4 001
Mines, industries and business	337
Department of Water and Sanitation	324
Municipalities	321
Other state departments	68
Water boards	51
Total	5 102

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