



COORDINATES (degrees, minutes, seconds)

LATITUDE	LONGITUDE
26° 53' 00" S	28° 07' 00" E

## LOCATION

Vaal Dam is located in quaternary catchment C12L and C83M in the Middle Vaal Water Management Area in South Africa.

## DESCRIPTION

The Vaal Dam is a composite dam consisting of a 714-m-long concrete gravity wall and a main earth embankment on the right bank which is 1,970 m long and connects directly with the concrete wall. A secondary earth embankment of 910 m closes off a saddle on the right flank. In the early fifties the dam wall was raised by 6.1 m and in 1985 by a further 3.05 m. The dam has a full supply level of 1,484.6 m and a dead storage level of 1,462.9 m. The bottom of the reservoir is at 1,444.5 m.

## PURPOSE

It is the main source of water to the Gauteng economic hub.

Rand Water Board is the major water supplier and has two major offtakes from the Vaal River at Zuikerbosch and Vereeniging downstream of the Vaal Dam. Zuikerbosch Pumping Station receives water via a canal from Vaal Dam and from the Lethabo Intake Station while Vereeniging Pumping Station receives water from the Lethabo–Vereeniging pipeline. There is an abstraction point at the Vaal Barrage but it has not been in use for about 20 years and needs to be upgraded. The Zuikerbosch Water Purification Works supplies mainly the eastern part of Johannesburg and Pretoria while the Vereeniging works supplies greater Johannesburg and the Vereeniging–Sasol area.



Vaal Dam (© UNOPS/C Mor)



## VAAL DAM

The Rand Water system is very complex and extensive and has been summarised below as five main routes:

- ▣ Vereeniging Pump Station to Heilbron (pumping main) supplying areas Vanderbijlpark, Sasolburg and Heilbron.
- ▣ Vereeniging and Zuikerbosch pump stations to Zwartkoppies and Zuurbekom pump stations to Libanon and Blyvooruitzicht reservoirs to Khutsong (gravity main). Included are boreholes at Zuurbekom, which are also managed by Rand Water. Supplies areas of southern Johannesburg, Soweto, the Westonaria and Carletonville magisterial districts and Khutsong.
- ▣ Vereeniging and Zuikerbosch pump stations to Zwartkoppies Pump Station through Pretoria to the Hartebeespoort area and Mamelodi (gravity main). Supplies areas in the Alberton, Germiston, Kyalami and Pretoria metropolitan districts, Mamelodi, Atteridgeville, Soshanguve and the Hartebeespoort area.
- ▣ Vereeniging and Zuikerbosch pump stations to Zwartkoppies and Bloemendal pump stations to Wildebeesfontein (gravity main). Supplies areas in the Alberton, Germiston, Boksburg, Benoni, Brakpan, Springs, Nigel and Heidelberg metropolitan districts and to Devon, Leandra and Evander.
- ▣ Vereeniging and Zuikerbosch pump stations to Zwartkoppies to Rustenburg (gravity main). Supplies areas of Greater Johannesburg and the Randfontein, Krugersdorp and Magaliesburg metropolitan districts and Rustenburg.

## PHYSICAL INFORMATION

Dam name	River	Quaternary catchment	FSC* (million m <sup>3</sup> )	FSA (km <sup>2</sup> )	Owner	DWA code	Wall height (m)	Wall length (m)
Vaal	Vaal	C12L and C83M	2,609.80	322.75	DWA	C1R001	63	2,783

\* Live full supply capacity (SANCOLD, 2009)

Year of completion	Demands/abstractions (million m <sup>3</sup> /a)			1:50 yield (million m <sup>3</sup> /a)	Maximum spillway capacity (m <sup>3</sup> /s)
	Domestic	Irrigation	Other		
1936	852 †	Unknown	Unknown	831 ‡	25,000

† DWA, Directorate of Hydrological Services correspondence, 2012

‡ DWA, 2002a



## VAAL DAM

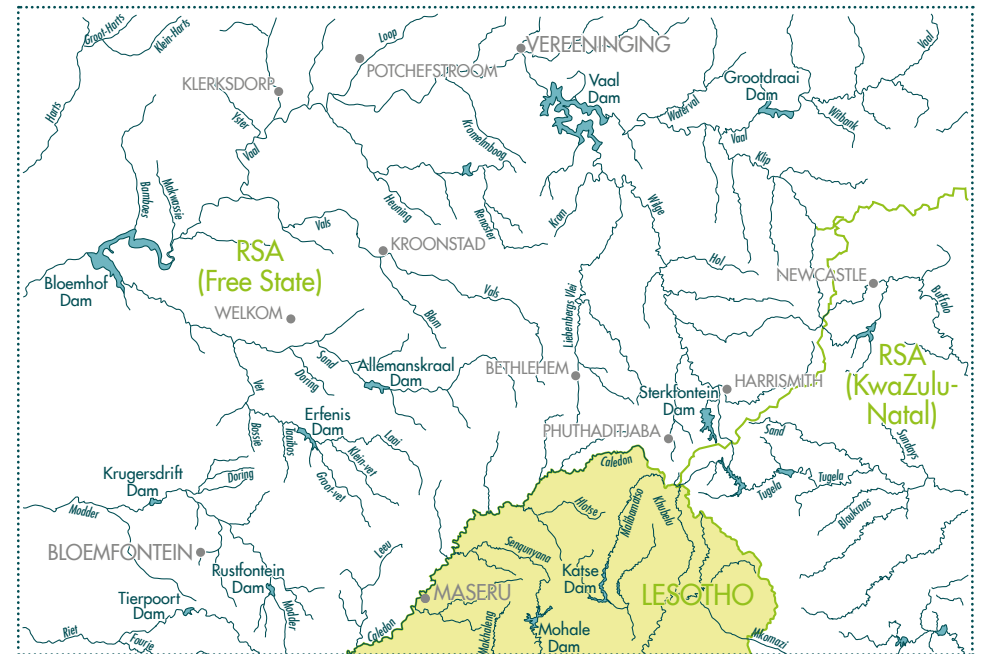
### AREA-CAPACITY RELATIONSHIP

Elevation (m)	Storage (million m <sup>3</sup> )	Surface area (km <sup>2</sup> )
1,485	2,609.80	322.75
1,484	2,280.82	298.35
1,483	1,994.65	274.71
1,482	1,733.12	249.37
1,481	1,496.83	224.41
1,480	1,284.90	200.98
1,479	1,095.93	178.62
1,475	559.66	91.50
1,471	339.27	56.38
1,456	6.38	2.61
1,445	0.00	0.00

### OPERATING RULE

The Vaal Dam, along with Grootdraai Dam, the Vaal Barrage, Bloemhof Dam (all on the Vaal River) and Sterkfontein Dam (on the Wilge River, a tributary of the Vaal River) form part of the Bloemhof Sub-system, which is part of the greater Integrated Vaal River System. Woodstock Dam and the Driel Barrage (situated in the Thukela River catchment), form the Thukela Transfer Scheme into the Vaal catchment).

The large scheme is operated as follows: The Thukela system supports Sterkfontein Dam until the dam is full. Grootdraai Dam does not support the Vaal Dam, but



Dam network

when the Vaal Dam is at 15% storage or less, Sterkfontein will begin to support it. Abstractions at Sedibeng and Midvaal make use of local runoff and spills from upstream dams. When this is not adequate, the Vaal Dam supports the abstractions. The Vaal Dam will only begin to support Bloemhof Dam when Bloemhof Dam reaches its minimum operating level (1,213.6 m).

The Vaal catchment also receives water from the Lesotho Highlands Water Project, in which 777 million m<sup>3</sup>/a is released from Katse Dam in Lesotho, to the Vaal Dam.

