

# Orange-Senqu River Awareness Kit

[THE RIVER  
BASIN](#)[PEOPLE AND  
THE RIVER](#)[GOVERNANCE](#)[RESOURCE MANAGEMENT](#)

## The River Basin

Water Quality: Acidity, Heavy Metals and Radionuclides:



### Coal Mining and water

- Introduction
- ▶ Geography
- ▶ Climate and Weather
- ▶ Hydrology
- ▶ Water Quality
  - Principles of Water Quality
  - Biological Water Quality Parameters
  - Spiritual Meaning of Water
  - Human Impacts to Water Quality
  - Acidity, Heavy Metals and Radionuclides
    - The Legacy of Gold Mining
    - ▶ Coal Mining and water
    - Solutions
    - Heavy Metals
    - Radio-Nuclides
    - Groundwater Quality
    - Water Quality Fitness for Use
    - ▶ Ecology and Biodiversity
  - References



South Africa's coal mines also contribute to the acid water problem. South Africa is the world's fifth-largest producer of coal, and extracts 250 million tonnes each year. A quarter of this is exported, earning invaluable foreign currency. More than half of the remainder is earmarked for generating electricity in power stations run by the parastatal Eskom. About 62 million tonnes are converted into fuel and chemicals by the petro-chemical industries. The country's main coal reserves are located just outside the Orange River basin, in the province of Mpumalanga in the east of the country. They are expected to last anywhere from several decades to another 150 years.

Coal and the industries that depend on it account for a lot of water. After coal has been mined, it must be washed. Coal-fired power stations require large volumes of water for steam production and cooling. The petrochemical industry is in the same boat. Though its water is recycled several times, eventually salt-rich sludge must be treated as hazardous waste.

Much of South Africa's coal is produced from opencast mines, and even here water has to be pumped out on a constant basis. This is because most coal is found below the water table. Acid mine drainage becomes especially acute after a mine has closed. In the eMalaheni region, where the country's largest coalfields are located, many opencast and underground mines have been out of action for decades. In these areas 50 million litres of mine water are released into the environment every day. It is not radioactive but it is saturated with acid and heavy metals.

South Africa's power plants burn 110 million tonnes of coal every year – which will soon increase, as Eskom is currently constructing two of the largest coal-fired plants in the world. Each of these will have a capacity of 4 800 megawatt. The coal burnt here has a sulphur content of about one percent. Approximately three quarters of the sulphur is captured. The remaining combustion gases – among them 275 000 tonnes of sulphur in the form of sulphur dioxide, as well large amounts of fly ash – are emitted into the air. The result is acid rain. Sometimes it contains heavy metals that harm water bodies, soils and wildlife.

[Next: Solutions](#)

#### Feedback

[send a general website comment](#)[report a specific problem with this page](#)

#### Basin Map

Explore the sub-basins of the Orange-Senqu River

[enter](#)

#### Video Tour

Tour video scenes along the Orange-Senqu River related to the River Basin

[enter](#)

#### Geography Maps

Investigate land cover and terrestrial ecoregions in the basin

[enter](#)

#### Water Cycle

Examine how the hydrologic cycle moves water through and around the earth

[enter](#)

#### Food Web

Explore the interactions of living organisms in aquatic environments

[enter](#)