



# Jones & Wagener

Engineering & Environmental Consultants

59 Bevan Road PO Box 1434 Rivonia 2128 South Africa  
tel: 0027 11 519 0200 www.jaws.co.za email: post@jaws.co.za

## ENGINEERING HYDROLOGY CAPABILITY STATEMENT

Jones & Wagener is a firm of engineering and environmental consultants, established in 1966. Our Hydrological Engineering capabilities are discussed below in more detail.

### ENGINEERING HYDROLOGY

The focus of our Hydrological Engineering division is storm water and water balance management, primarily on mining and industrial sites. Flood studies and flood risk assessments form another core competency.

We pride ourselves on developing solutions that provide an optimised design up-front in order to optimise the water management over the life of the project and operation, balancing both cost and environmental considerations.

Our engineers and hydrologists are experts in water management planning, water balance modelling and catchment runoff modelling.

Some of the major industries and clients that we have serviced over many decades, and keep servicing, include:

- **The Mining Industry:** Coal, Gold, Iron Ore, Diamonds.  
*Anglo American, Glencore, BHP Billiton, Kumba Iron Ore, Sasol, DeBeers, Exxaro.*
- **Power Industry:** Coal Power Plants.  
*Eskom.*
- **Heavy Industrial Plants:** Smelters, Processing and Manufacturing Plants etc.  
*Sasol, Arcelor Mittal.*

Apart from working directly for the development client, J&W is often sub-consulted for specialised hydrological and water management services by other consultants, including SRK Consulting, SLR Consulting, Clean Stream Environmental Consultants and Jacana Environmentals.

We also provide key hydrological services to other divisions of J&W where required for the design of waste and tailings facilities, mining infrastructure, as well as environmental and water management projects.



## Hydrology and surface water studies

A hydrological study is an essential element of any new development, be it a small industrial, commercial or residential site, or a large mine. The hydrological study is carried out either as part of a larger project (e.g. as part of the environmental authorisation process) or is offered as a stand-alone service.

Specific services include:

- Surface water specialist studies.
- Surface water impact assessments.
- Floodline determinations.
- Flood risk assessments.
- Flood risk management planning.
- Catchment runoff modelling.
- Dam sizing.
- GN704 audits and best practice assessments.
- Water quality assessments.

## Water management and water management planning

We specialise in water management planning and design of water management infrastructure for mines and industry. We have been involved in many projects for new, existing and defunct mines. There are various solutions for managing surface water on a mine or industrial site and a thorough investigation is required before a comprehensive water management strategy can be devised.

Specific services include:

- Storm water management planning (SWMP), including clean and dirty water separation system design, such as clean water diversion systems and dirty water containment systems, such as collection canals, silt traps and pollution control dams.
- Integrated water and waste management planning (IWWMP).
- Flood management and flood protection planning, including river diversion and flood protection berm design.
- Water balance modelling (see below).



## Water balance modelling

Water balance modelling for a site is required primarily to estimate the expected water surplus or deficit for the site as a key input to water management planning.

Water balance modelling is a key strength of Jones & Wagener's Hydrological Engineering division and we are leaders in the field in South Africa, particularly in the coal mining industry. We pride ourselves in adding value to a project through our water balance modelling, by doing scenario planning in order to optimise the water balance so as to minimise either the make-up water requirements or the surplus water make.



The Jones & Wagener water balance model has been developed in both the Excel spreadsheet environment, programmed in Visual Basic, as well as the GoldSim systems modelling environment. We are able to compile the water balance model for a site in either software environment. The selection of Excel or GoldSim is dependent on both the client's requirements/preferences and the complexity of the site in terms of water management. A more complex site lends itself to a GoldSim model, while a simpler site lends itself to an Excel.

Specific services include:

- Strategic life of mine water balance. This type of water balances is used to forecast the water balance for the life of the project. It is used for long term water management planning, as well as for input to environmental authorisations, particularly water use license (WUL) applications.
- Operational water balance. The operational water balance is used to record the historical water balance on a site and for short term scenario planning. It is a tool to help understand the water systems on site and to evaluate the efficiency of water use and recycling, as well as to measure the site's water use against the water use license conditions.

