



Jones & Wagener

Engineering & Environmental Consultants

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MINING INFRASTRUCTURE PLANNING & DESIGN DISCIPLINE STATEMENT

Jones & Wagener (Pty) Ltd (established in 1966) is a firm of engineering and environmental consultants. Our Mining Infrastructure, Planning & Design capabilities are outlined below.

MINING INFRASTRUCTURE

Jones & Wagener's expertise lies in the design of all civil infrastructure required to support the mining operation. This infrastructure can be broadly divided into the categories discussed in more detail in the following sections. It should be noted that the planning and design of the infrastructure described, in many cases relies on the inputs of other disciplines such as structures and geotechnical. In other cases the design also calls for expertise and inputs from other disciplines, such as mechanical or electrical, which is provided by consultants with whom we have a well-established working relationship.



Water management

One of the most important considerations for mining, and specifically opencast mining, is the management of both clean and polluted water. Jones & Wagener's first infrastructure projects for the mining industry were in the field of water management in the early 1990's. There are various components to water management and our field of expertise covers the entire spectrum, including:



- Preparing detailed water balances. These are used as inputs to a water management strategy that can cover a specific reserve, mine or complex comprising several mines.
- Clean water diversion systems, including diversion canals, river diversions and attenuation and storage dams up to 15,000,000 m³ in size.
- Pollution control infrastructure, including lined and unlined collections canals, silt traps and pollution control dams (both lined and unlined) ranging in size from 50,000 m³ to 2,000,000 m³.
- Water transfer infrastructure, including pump stations and pipelines.
- Water treatment and evaporation



- Dam safety inspections and audits. For the design and dam safety evaluation of any dam classified with a safety risk, an Approved Professional Person (APP) is required in terms of the Dam Safety Regulations. Three of Jones & Wagener's engineers are APP's.

Jones & Wagener's environmental division, as well as other environmental consultants, responsible for the preparation of EMP's and IWULA, make use of the environmental engineers for the design of water management infrastructure which forms an integral part of these applications.

Bulk earthworks, terracing and stockpiles

Bulk earthworks form an integral part of any mining development. Over the years Jones & Wagener has designed numerous mining infrastructure developments, which included the following infrastructure:

- ROM Tips including retaining walls.
- Overland conveyer terraces and service roads.
- Coal stockpiles and associated water management infrastructure.
- Overburden and Waste Rock Stockpiles
- Terracing for mining infrastructure, such as office complexes, workshops, etc.
- Hard parks for mining equipment.

Haul roads and dragline walkways

Jones & Wagener has extensive experience with the planning of haul road layouts and the positioning of the ROM Tip in consultation with the mining engineers. Haul distances could have a major impact on operating cost and have to be optimised. Furthermore, there are safety considerations, both related to traffic and geometric layout, which must be taken into account. In addition the cost of haulroads can be significantly reduced if locally available materials can be used. This is an area where Jones & Wagener has developed significant expertise.

Jones & Wagener has been actively involved with the design of haul roads on several coal mines in Mpumalanga. This included assistance with research done by Pretoria University on determining design parameters for the construction materials available locally. The design philosophy adopted



has proven to be adequate, with some haul roads now in use for more than 10 years.

Jones & Wagener has assisted several mining companies with the relocation of draglines, sometimes over distances of up to 70 km. As far as we know we are the company in South Africa with the most experience in this specialised field. To date we have been involved with the relocation of draglines totalling a distance of more than 200 km.

