

Asset Valuation at Work in the Mining Industry



RHDHV is a global, privately owned and independent consulting firm specialising in all aspects of design and operation of mining, mechanical, electrical and logistic systems for surface and underground mines, the study and evaluation of mining projects and the full range of mining operations. Based in Johannesburg and the UK, RHDHV (formerly Turgis Mining Consultants) was established in 1990 as a specialist technical consulting firm serving the broader mining industry.

Our specialist expertise includes open pit and strip mines in iron ore, gold, platinum, copper, chrome, manganese, and coal mines; ultra deep level (to 5000 m below surface) in gold mines; deep level (between 1000 and 5000 m below surface) in gold, platinum, copper and coal mines; and shallow underground (less than 1000 m below surface) in gold, platinum, chrome, manganese and coal mines.



OUR ASSET VALUATION CAPABILITY

RHDHV offers professional and confidential services in all aspects of the valuation and risk profiling of mine infrastructure. These services are of particular interest in the context of the insurance of mining assets, the evaluation of the risk to those assets, and in the determination of monetary loss when a loss has occurred.

Many of our mechanical, electrical, mining and metallurgical engineers have held senior operational management positions on mines and have a thorough understanding of how mines operate, and of the time and cost required to address interruptions to production, damage to infrastructure and disaster incidents.

Our understanding of mining operations also allows us to profile the risk that mines face from a disruption of all or part of its supporting infrastructure and processes. In assessing risks of this nature, we consider issues such as age of the infrastructure, design and engineering controls previously applied, and the efficacy of planned maintenance practices.



CONFIDENTIALITY

We are mindful of the confidential nature of asset valuation and risk profiling, and impose appropriate standards of confidentiality on our contributing engineers. We maintain rigorous standards of documentation and information control. RHDHV's independence is ensured by the fact that ownership rests solely with its parent company DHV Holdings BV in the Netherlands.



Formerly **TURGIS** Mining Consultants

MINING OPERATIONS INSURED VALUE ESTIMATION METHODOLOGY

Asset valuation and specialised asset valuation teams in the mining and industrial markets is crucial for the financial health of companies. RHDHV has developed a unique methodology to calculate a reasonable new replacement valuation of the assets associated with mining infrastructure and metallurgical plants for insurance purposes. It is not intended to be a detailed audit of the mine infrastructure. We are in a key position in Southern Africa to provide asset valuation services because we approach it from an operational, not auditing, viewpoint.



Initially, mines are visited to obtain information, data sheets, and drawings specifications, as a base for compiling the data sheets for each. Information is reasonably available for newer operations, but can be very limited for older operations. We then develop an asset register, assessing which assets are critical, and to produce realistic replacement values for these assets. Once this is done, we go a step further than other companies and provide financial risk analysis. This includes a depreciation of the client's assets, resulting in our clients being able to maximise their potential for tax benefits. We are currently working on developing this service even further, by examining asset performance, risks and costs, to provide the client with the optimum utilisation of their assets. We also provide statistical analysis on all the financial aspects of the asset valuation.

The various types of mines are separated into four categories.

One

Surface infrastructure, which includes all plant and equipment installed above the collar of shaft and outside of the headgear. This includes buildings, winding plant, and services; electrical reticulation, compressed air infrastructure, ventilation infrastructure, refrigeration plant, bulk water infrastructure, waste water infrastructure, and rock handling infrastructure.

Two

Shaft infrastructure, including headgear, shaft lining, shaft furnishings; ventilation shaft where applicable; pumping equipment; underground ore handling equipment, spillage arrangements, station steelwork and equipment, signalling equipment. Associated service equipment such as underground refrigeration plant, energy recovery plant, bulk air coolers, mud displacement systems and the like. It does not include the cost of mining the excavation itself.

Three

Production infrastructure, including: the cost of equipping (tracks, pipes and cables) all haulages required to support the one year mine plan; stoping and development equipment (drills, winches, locomotives, hoppers, loaders), underground ventilation fans (booster or in-line), cooling cars, power and water reticulation, cost of equipping ore passes (boxes and tips) and trackless mining equipment, as applicable.

Four

Metallurgical Plant Operations

Based on the through understanding of the mine that arises from this process, we then apply our specialist skills to the aspects of asset valuation and risk management that are of particular interest to our client. This could include maintenance management, including principles, philosophies, forecasting and planning.

Our services include open pit and underground mining equipment optimisation. These could include lifecycle costing, optimum replacement intervals, challenger/defender models, operational enhancement/ optimisation, equipment selection using Talpac simulations, dynamic modelling using Arena software, procurement specifications and tenders.

In addition, we examine the maintenance of the asset and resource utilisation, including bulk services, such as power, water, compressed air (steady-state and dynamic), ventilation (steady-state and dynamic), and environmental refrigeration plants.



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ASSET VALUATION EXPERIENCE

We have previously undertaken asset valuation and risk profiling assignments for various mines, mining houses and insurance companies.

Since 2005, we have delivered asset valuation for two companies, Harmony and African Rainbow Minerals, on many of their operations.

The asset valuation covers various process areas from an operational viewpoint by an experienced team. These include:

1. Surface infrastructure, including offices, changehouses, etc.
2. Shaft section, including winders, and anything within the shaft barrel.
3. Production, including logistics, mining equipment, etc.
4. Processing plants and mechanised fleets.



Our scope has included deep level underground mines, shallow underground mines, open cast or pit mines; with shafts and declines access, smelters, earth-moving and trackless fleet and associated support equipment.

Due to the extensive asset valuation services we have delivered to these two companies over almost a decade, we have the experience to apply this expertise to any industrial process.

Our Asset Valuation Team

Etienne de Villiers B.Sc. Eng. (Mech.)

Etienne is experienced in the design of underground reticulation services and pump stations, as well as the design of compressor houses on surface. His expertise includes design and installation auditing of underground services and the compilation of Work Breakdown Structure (WBS), Control Budget Estimate (CBE) and Asset Register documents for the client. This makes him a key member of the asset valuation team, providing financial and statistical analysis for risk profiling.



Ken Reading B.Sc.Eng. (Elec.); Electrical Engineers Certificate of Competency (Mines and Works)

Ken has spent the vast majority of his 45 year career in the mining industry with Anglo American and, latterly, with AngloGold Ashanti. He has significant experience in all aspects of the design and operation of mines, and has operated at the most senior production and engineering management levels. He has extensive experience in plant and mine site infrastructure design. He is a specialist in the sale off assets technical risk evaluation.



Keith Wilson B.Sc. Eng. (Mech.); Government Certificate of Competence Mines (Mechanical)

Keith is Chief Executive Officer of RHDHV Mining. He has been responsible as project manager for many of the study work undertaken in the manganese and iron ore projects mentioned above. He also has recent experience as engineering manager on large operating open cast mines in South Africa where he was responsible for all mining and maintenance contracts including the operation of the large mining fleet.

Johan Oberholzer Pr.Eng. B.Sc. (Elec. Eng.), Certificate of Competency (Mines and Works), SA, Senior Member South African Institute of Electrical Engineers

Johan's experience in the consulting field covers diverse skills ranging from building services design, MV voltage reticulation systems for commercial, surface and underground mining, residential clients and low and medium voltage installation, instrumentation and control systems for industrial installations covering mining plant, water, waste water and pumping installations and general industrial plant. He has 10 years experience in the maintenance of mechanical and electrical equipment in the mining and related industries.

Willie Schoeman B.Sc.Eng.(Mech.); Mechanical Engineer's Certificate of Competency (Mines and works), SA; Professional Engineer, Engineering Council of South Africa

Willie's extensive experience covers most mining related disciplines from feasibility studies through to construction, commissioning, operating and maintaining plant. His experience includes underground and open cast mining, track-bound and trackless haulage, pumping installations, hoisting, compressed air, bulk materials handling, ore beneficiation, smelters, general mine surface and underground infrastructure and mine closure and rehabilitation. He also has considerable experience in fresh and waste water treatment and pumping plants.

The rest of the specialist team includes:

Ken Howes

Richard Way

Derek Walters

Chris Smythe

Maurice Boustead

Ed Baldrey

Denni Cartwright