

# natural capital

Natural resources (energy and matter) and processes are needed to produce products and deliver services, including sinks that absorb, neutralise or recycle waste (such as forests), resources (some renewable, others not) and processes (such as climate regulation and the carbon cycle) that enable life to continue in a balanced way. All organisations rely on natural capital to some degree and have an environmental impact; consuming energy and creating waste. Organisations need to be aware of the limits in the use of the natural environment, and to operate accordingly.

Sibanye is committed to the responsible stewardship of natural resources for present and future generations. The Group takes a precautionary approach in all activities by:

- assessing and meeting the requirements of industry standards with respect to environmental management practices;
- implementing, maintaining and integrating internationally recognised environmental management systems (EMSs) that ensure continuous improvement of environmental performance and the prevention of pollution through recognised practices;
- complying with applicable legal and other requirements relating to environmental aspects;
- using resources efficiently and managing all waste streams responsibly;
- contributing to the conservation of biodiversity and applying integrated approaches towards closure and post-mining land-use planning; and
- establishing an appropriate level of awareness and training of employees with environmental responsibilities, as required.

## MORE THAN COMPLIANCE

Sibanye's approach to environmental management is risk-based, with a strong focus on management assurance, legal compliance and, ultimately, mine closure. The Group's approach is, therefore, integrated within its broader Sustainable Development Framework.

An overarching EMS that is aligned with the ISO 14001 standard is in place across the group, with appropriate operating procedures at an operational level. Sibanye's

EMPs, one of the pillars of its legal right to mine the resource, are legally binding commitments that have been agreed with the regulators. The EMP is based on sound environmental management principles and associated risks and, incorporates risk management and the mitigation measures implemented.

## Materials used

Sibanye in the course of its normal business mines significant amounts of gold bearing ore and associated waste rock. Sibanye's emphasis on quality mining ensures that the Group removes as little waste rock as possible and focuses on removing the gold-bearing reef. The reprocessing of surface gold-bearing material supplements the processing stream and has a positive environmental impact.

Hydrometallurgical extraction is the only economically viable method of extracting gold from the gold bearing ore and involves a leaching step during which gold is dissolved in an aqueous medium. This is followed by the separation of the gold-bearing solution from the residues, or adsorption of the gold onto activated carbon. As gold is not soluble in water, cyanide is used to stabilise gold in solution and, with oxygen, is used to dissolve the gold.

While cyanide is less costly and potentially less harmful than other reagents with similar properties, there are risks associated with its storage and use. All of Sibanye's mines and plants comply with the International Cyanide Management Code for the Manufacture, Transport and Use of Cyanide in the Production of Gold. (Beatrix was last certified in February 2012, Driefontein in August 2012 and Kloof in December 2012).

## Water management

Water is a critical resource for the Group and for South Africa as a whole, and one which Sibanye manages with care.

Sibanye focuses on achieving integrated dynamic mine water management through the SibanyeAMANZI Project. This is aligned with the Group's business model in terms of the integrated mine water plan.

All three of Sibanye's operations are water-positive, which means they need to pump significant quantities of underground water to dewater for safety purposes. Neither the quantity nor the quality of water sources (fissure or potable water sources) is under threat. However, the future cost of water remains a risk.

The receipt of integrated water use licences (IWULs) remains a concern for the mining industry as a whole, with a significant backlog in their issuances by the DWA. In the absence of issued or valid IWULs, water management is conducted taking cognisance of current legislation and the permits, exemptions and directives that have been issued.

## Energy

The gold-mining industry is a significant user of energy, and is vulnerable to variations in energy supply and cost. Given the national power utility Eskom's difficulties in meeting energy demand, security of supply is by no means certain. Eskom's reliance on fossil fuel based energy exposes its clients to impending carbon tax.

As a Group, Sibanye is committed to monitoring usage, researching and developing new strategies for efficient energy use, complying with legislation and encouraging its business partners to adopt similar principles.

Sibanye has undertaken numerous energy-saving, load-clipping and load-shifting projects over the years. The latter is aimed at reducing usage when consumer demand peaks and are often funded by Eskom Integrated Demand Management programme.

Although Sibanye has reduced energy consumption, a significant portion of this reduction has been as a result of downscaling operations and reduced production over the years. In 2013 Sibanye achieved a saving of 33.4MW compared to 2012 due to various initiatives and projects. However, there was also a 6.9MW increase as a result of new load that came on line during 2013 due to increased production.

Sibanye seeks to make use of alternative energy sources, where feasible, in order to offset fossil-fuel generated Eskom energy. The Beatrix methane project and the concentrated solar power (CSP) plant at Driefontein are examples.

#### Carbon management

Sibanye's Carbon Management Strategy (CMS) is integrated with its approach to energy management, given that its carbon footprint is dominated by its energy use and, in particular, the use of fossil-based electricity sourced from Eskom.

In terms of Sibanye's Integrated Energy and Carbon Management Strategy (IECMS), the Group seeks to understand and manage its energy/carbon footprints, investigate renewable energy sources, invest in energy saving equipment with improved efficiencies and empower employees with knowledge and awareness.

While energy-consumption targets are set and measured at an operational level, translations from energy consumption into carbon intensities are conducted as part of the on-going carbon-footprinting exercise. Depth of mining and ore yields are taken into consideration when setting carbon intensity ratios.

The Beatrix methane project, which captures and utilises methane for electricity generation, as well as the ventilation fans projects at Beatrix, Driefontein and Kloof have contributed to the optimisation and reduction of carbon dioxide (CO<sub>2</sub>) emissions. Another carbon-reduction project at Beatrix was registered under the Clean Development Mechanism (CDM) of the Kyoto Protocol in late 2013. It involves the installation of energy-efficient axial ventilation fans in the mine's underground operations.

Sibanye is also involved in a number of projects in collaboration with Eskom, supporting the use of renewable energy such as solar power, and climate-change adaptation initiatives such as the optimal TSF Cover Design Study.

#### Land management

In 2013 Sibanye owned or held licences over approximately 36,690ha of land; only 7,449ha of land have been disturbed by mining and processing activities. A Biodiversity Action Plan (BAP) has been developed for Driefontein, while a biodiversity assessment that will inform a BAP for Kloof is underway. A similar process will be undertaken for Beatrix in 2014.

Sibanye aims to work towards final land use at all stages of operation. A land-use survey was, therefore, conducted to determine current and proposed activities within the areas of operation. Importantly, the Group's aim is to link its LED projects with land management and rehabilitation to ensure sustainable land use that will be viable once mining operations come to an end.

Closure planning is closely linked to the Group's life-of-mine plans. Interim closure plans are in place and are reviewed every two years. Detailed closure plans will be developed for all operations from 2014. Where possible, demolition and rehabilitation takes place during the operational phase.

Sibanye's closure liabilities are assessed on an annual basis by Golder Associates (Proprietary) Limited, and it has the requisite trust funds and insurance guarantees in place to provide for closure. See page 73 of the Sibanye Sustainability Report 2013 for details.

For more information on all aspects of Sibanye's natural capital refer to the Sibanye Sustainability Report 2013.