



MANAGE ENVIRONMENTAL IMPACT

APPROACH

Sibanye upholds the highest environmental standards and complies with all applicable legislation governing the use of resources, responsible waste management, conservation of biodiversity, and closure and post-mining land use. Employees are also kept informed, and they are encouraged to adhere to and practise our environmental policy.

PERFORMANCE

WATER MANAGEMENT

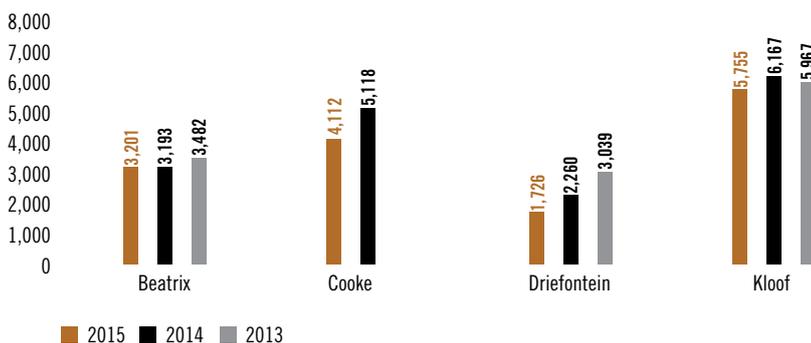
Total water withdrawal was 114,735MI in 2015 with 14,795MI (13%) from municipal sources (potable water) and 99,940MI (87%) from underground sources. While the volumes withdrawn from ground fissure water did not change significantly, notably less potable water was withdrawn from municipal sources as a result of the water-treatment plant commissioned at Driefontein.

Total water withdrawal includes groundwater extracted from underground sources and water purchased from municipalities.

Sibanye's water-management team focuses on four functional areas:

- Compliance:** Water use-licence compliance improved as result of specialist interventions on surface and underground. The team approached the regulator to consider amendment of certain water use-licence conditions in order to align current water use licences with the proposed resource-quality objective and catchment realities. We also prepared and completed the WRTRP water use-licence application. The regulator conducted several audit inspections but no directives were issued. Assistance was provided in upgrading the Driefontein water laboratory for analysing many operational water samples.
- Innovation and projects:** The team focused on several water-use improvement projects, including further process optimisation and refurbishment of the Driefontein North Shaft water-treatment plant. A 5MI/day crystalactor softening plant was completed at Cooke 4, and Sibanye initiated the design and construction of the 30MI/day settlers for the Trans Caledon Tunnel Authority Western Basin Water Plant Upgrade Project. The purpose of this project is to improve stability of the side walls of Dump 20 and restrict AMD into the environment. Test work was done on metal and salt reduction from underground water using lime softening and coagulation as unit processes.
- Operational and maintenance support:** This provided support in the operation of the 20MI/day Driefontein North Shaft water plant, which achieved a 20MI/day saving in Rand Water intake. In addition, focus was on optimal operation of Sibanye's underground settlers. By splitting underground fissure water and mine process water systems, Sibanye improved water quality in the discharges. The team also continued developing compliance and operational water and salt balances for mining sections.
- Awareness and stewardship:** Several community visits were hosted at the Western Basin surface operations, including a visit by government. Sibanye participated in several stakeholder and water-management public forum meetings. The SibanyeAMANZI strategic programme was updated and the revised strategy was presented to the Executive Committee. The focus of the SibanyeAMANZI strategy remains the improvement of water use-licence compliance, reducing the use of municipal water and water conservation/water demand management as well as reducing the cost of water management.

Total potable water consumption (MI)

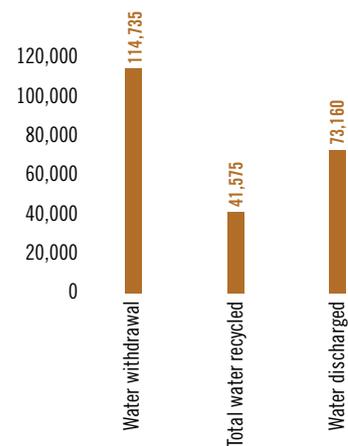


WATER USE LICENCE STATUS

Rand Uranium (Cooke 1, 2 and 3), Ezulwini (Cooke 4), Kloof, Driefontein, Beatrix and Burnstone all have current water use licences or authorisations.

Applications have been made for amendments to some of these water use licences, and feedback from the Department of Water and Sanitation (DWS) is pending.

Water use (MI)



In line with water use-licence requirements,

we reported 11 water-related incidents to the DWS in 2015. Generally, these incidents related to accidental water discharges and spills.

WASTE MANAGEMENT (Mt)

	2015	2014	2013
Tailings into TSFs	14.31	15.73	13.11
Tailings into pits	4.20	3.79	–
Waste rock	7.14	0.60	0.76
Recycled	11.34	11.96	13.29
Total mining waste	25.65	20.12	13.87

TAILINGS AND WASTE PROGRAMME

To reduce costly double handling of development or waste rock, previously hoisted separately and stored on rock dumps for future processing through dedicated surface material plants, a decision was taken in 2014 to mill and process development rock with underground ore at all operations. Significant effort has also been made to improve the quality of mining factors, such as reducing dilution by lowering stoping widths and ensuring that as much gold is recovered from the stoping area as possible by improving seepings in order to reduce or eliminate accumulations. Reducing dilution by minimising the amount of waste rock mined has significant cost benefits, including less effort on mining and processing waste material not containing gold, resulting in higher yields. Environmental gains include a smaller SRD footprint as land use is reduced, lower dust emissions and more effective management of water pollution.

There are environmental and health risks associated with the use of cyanide, the primary reagent for leaching gold from ore. The International Cyanide Management Code for the manufacture, transportation and use of cyanide in the production of gold is embedded in Sibanye's management processes and systems, and management assurance is an ongoing process. No cyanide-related incidents were reported at our operations in 2015. Sibanye purchased 11,924t of cyanide in 2015 (2014: 11,758t)

AIR QUALITY MANAGEMENT

While surface dust levels at our operations in 2015 were generally below legislated limits, some exceedances were experienced mainly as a result of the extremely dry weather in the latter part of 2015, continuing into 2016. As a result, dust suppression required additional interventions.

Using dustfall regulations listed by the American Society for Testing and Materials (ASTM) International D1739 as a reference, single and multi-directional buckets were used to collect dust throughout 2015. Wind direction also provided information on potential sources that may be contributing to dustfall at particular points. A process to determine equivalence between the ASTM method and the multi-directional buckets began in 2014, and a technical paper was presented at the National Association for Clean Air Conference in 2015 for review and discussion with delegates. Work continues in 2016.

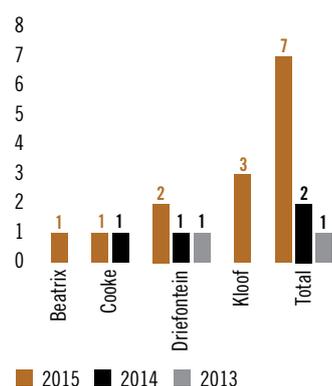
Ridge ploughing of the dormant No 1 TSF at Beatrix has been done to minimise dust blow-off. Ridge ploughing has been completed at the Cooke TSF and the roadways have been clad with rock to minimise dust liberation during tramming operations. At the Driefontein No 2 and 3 gold plants, tramming over gravel roads and rock-conveyor systems has been reviewed. The frequency of dust suppression on gravel roads has increased and some stockpiles have been decommissioned with trucks tipping directly into bins to minimise dust liberation. Installation of water sprays at the Driefontein No 2 TSF has begun with a view to commissioning in 2016. At Kloof, handling and transportation of tailings material from the dormant TSF beside Masimthembe Shaft has been reviewed. Watering down of gravel roads is more frequent and, during periods of high winds, loading and transportation activities are curtailed. It is envisaged that the WRTRP will provide a long-term solution for some of the TSFs on the West Rand. In the interim, holding patterns will be maintained.

Sibanye's listed activities affecting ambient air quality, identified by the Department of Environmental Affairs (DEA) through the National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004) (Air Quality Act), include the metallurgical smelting process, lead processes in the assay laboratories and waste incinerators at sewage works. To manage these processes, isokinetic sampling is used (particles are collected in a stream moving at the same velocity within the sampling device as in the sampled stream). The sample is analysed at a laboratory to determine composition and concentration of emission gases and particulate matter. Results are used in impact assessments.

All of Sibanye's operations with activities listed in terms of the Air Quality Act have provisional atmospheric emissions licences. In 2015, the operations focused on optimising compliance in terms of these licences, including quarterly stack-emissions sampling and engaging with the West Rand District Municipality.

As Sibanye complies with the Air Quality Act, legislated air quality standards in terms of this Act take precedence over South African National Standards (SANS) compliance. In terms of draft regulations on pollution prevention plans and atmospheric-emission reporting, as well as a discussion paper on desired emission-reduction outcomes, companies like Sibanye, emitting more than 100,000t carbon dioxide equivalent (CO₂e) per annum, may be required to submit five-year pollution prevention plans to the DEA. In addition, these companies may be allocated carbon credits, which have to be managed to achieve desired emission-reduction outcomes.

Air quality complaints



All operations

completed setup and initial reporting on the National Atmospheric Emissions Inventory System in 2015. Mandatory reporting begins in 2016.



MANAGE ENVIRONMENTAL IMPACT CONTINUED

REDUCING ENERGY CONSUMPTION

Energy-efficiency initiatives have been implemented across the Group, in line with Eskom's demand-side management programme, to reduce electricity consumption by 2% to 3% annually over five years. Employees are encouraged to conserve energy and more energy-service companies are due to be employed in 2016 to increase energy-saving measures. In 2015, Sibanye realised a saving of 15.8MW (2014: 23.7MW).

Sibanye has intensified load shifting to protect the national grid at peak times, to offset the effects of load curtailment when the national grid has been constrained and to manage peak power costs.

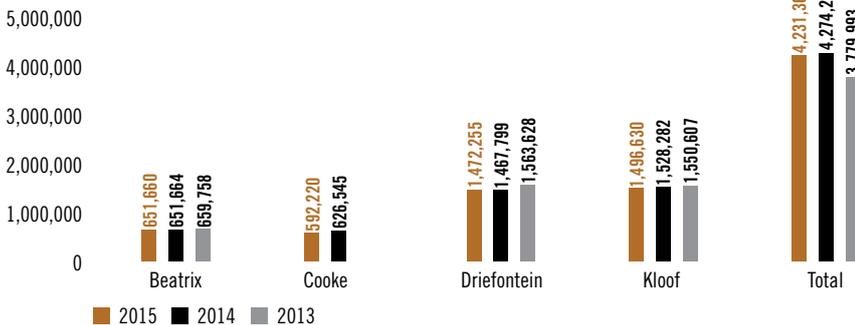
The Group measures, monitors and manages its energy and carbon footprints in terms of its integrated energy and carbon-management strategy. It has found that electricity consumption contributes approximately 85% to its total Scope 1 and 2 emissions (carbon footprint). The balance comprises fugitive methane emissions at Beatrix, as well as diesel, petrol, liquid petroleum gas (LPG), oxyacetylene, blasting agents and coal.

The strategy has been integrated with Sibanye's approach to energy management, given that its carbon footprint is dominated by energy use and, in particular, the use of fossil-fuelled electricity sourced from Eskom. Sibanye continues to design, develop and implement strategies that seek to reduce the energy consumption of operations and, thereby, reduce the carbon footprint of the Group, pursue any potential opportunities and use energy-efficient technologies where this is feasible.

The Beatrix carbon-reduction project, which includes secondary sealing activities underground and the use of methane gas to generate electricity, registered under the Clean Development Mechanism (CDM) of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) in 2013, accrued 34,591 certified emission reductions (CERs) in 2015 (2014: 30,051). CERs (also known as carbon credits) are emission units issued by the CDM to assist organisations in offsetting their emissions and complying with their targets.



Electricity consumption (MWh)



Burnstone electricity consumption for 2015 was 18,597MWh

ENERGY INTENSITY (GJ/TONNE MILLED)

	2015	2014	2013
Beatrix	0.73	0.69	0.70
Cooke	0.76	0.77	-
Driefontein	1.03	1.09	1.08
Kloof	1.56	1.36	1.36

EMISSIONS (tCO₂e)

	2015	2014	2013
Scope 1*	94,175	109,840	120,076
Scope 2	4,271,717	4,404,562	4,559,995
Scope 3	866,745	863,009	633,928
NOx (t)	618	19,901	14,618
SOx (t)	499	632	464

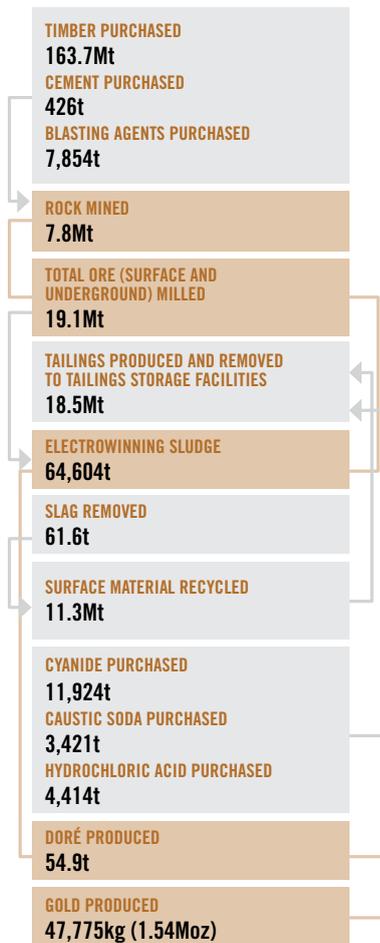
*Scope 1 emissions exclude fugitive mine methane, which amounted to 649,733tCO₂e in 2015.

Emissions from 13 of the 15 categories have been included under Scope 3 as follows:

1. Purchased goods and services: emissions associated with the extraction and production of timber, cyanide, hydrochloric acid, lime, cement, caustic soda and purchased water.
2. Capital goods: emissions associated with the production of purchased company-owned vehicles.
3. Fuel- and energy-related emissions not included in Scope 1 or Scope 2: emissions associated with the extraction, production and transportation of diesel, petrol, LPG, coal (industrial), blasting agents (ANFO), oxyacetylene and grid electricity.
4. Upstream transportation and distribution: emissions associated with the transportation and distribution of purchased timber, cyanide, hydrochloric acid, lime, cement and caustic soda between suppliers and Sibanye.
5. Waste generated in operations: emissions associated with the disposal and treatment of Sibanye's solid waste and wastewater in facilities owned or operated by third parties (such as municipal landfills and wastewater-treatment facilities).
6. Business travel: emissions associated with transporting Sibanye's employees for business-related activities.
7. Employee commuting: emissions associated with the transportation of Sibanye's employees between their homes and work sites.
8. Upstream leased assets: CO₂e emissions associated with leasing helicopters.
9. Downstream transportation and distribution: CO₂e emissions associated with transporting Sibanye's gold from the mines to Rand Refinery.
10. Processing of sold products: CO₂e emissions associated with smelting and refining gold.
11. End-of-life treatment of sold products: CO₂e emissions associated with smelting gold to repurpose the product.
12. Downstream leased assets: CO₂e emissions associated with the leasing of houses to mine workers where emissions are generated from electricity use.
13. Investments: CO₂e emissions associated with investment in companies, Living Gold and Rand Refinery. Sibanye has a 50% share in Living Gold and a 33.1% share in Rand Refinery.

Scope 3 emissions from the following 2 categories have not been included:

- Franchises: Sibanye does not have any franchises.
- Use of sold products: emissions associated with the use of sold gold products are deemed insignificant as only processing and end-of-life treatment of sold products are expected to have significant associated emissions.



FUTURE FOCUS

Sibanye is set to reduce its carbon footprint and improve its carbon intensity ratio through a combination of energy-efficiency and energy-saving projects as well as the introduction of renewable energy into its energy-supply mix.

Engineering Pragma System: aims to avoid incidents with daily inspection by pipewalkers, reporting of pipeline failure, regular maintenance and installation of flow meters – ongoing pipe-thickness testing identifies worn pipes.

REHABILITATION

Total land under Sibanye's management in 2015 and 2014 (including Cooke) was 50,316ha (2013: 36,690ha). The cumulative total of land disturbed by mining and related activities in 2015 and 2014 (including Cooke) was 17,359ha (2013: 7,449ha).

Biodiversity action plans (BAPs) are being developed for all operations. Driefontein's BAPs have been completed and implemented while a BAP for Kloof is due to be finalised in April 2016. The Kloof BAP includes a detailed land-capability study, which was extended to include the Driefontein freehold area. The Beatrix assessment is due to be completed in 2016.

Based on the outcome of a land-use survey conducted in 2013, indicating that landowners wanted to continue agricultural activities in future, Sibanye embarked on a study to determine the land capability of the Kloof and Driefontein properties in 2014. The study was finalised towards the end of 2015 and this information is being incorporated into the Kloof BAP to be included in the review of the Driefontein BAP in 2016.

As sustainable development and land management are closely related, alien vegetation is removed through LED projects at Kloof and Driefontein. This intervention was rolled out across the Group in 2015.

Potential soil contamination studies were conducted at Kloof and Driefontein, and identified areas with the highest risk of soil contamination. Phase 2 of the study will be conducted in 2016 in order to quantify contaminated soil and management plans will be compiled to address rehabilitation of these areas.

Sibanye's closure liability is assessed annually by a recognised independent consultant, and it is funded by trust funds and insurance guarantees. Closure liability as at 31 December 2015 was R3,817 million (2014: R3,549 million).

PERMITTING AND COMPLIANCE

The environmental management system is audited on a rotational basis. Each operation has an approved environmental management programme (EMP), which is a formal contract between Sibanye, as the holder of the mining right, and the regulator, the DMR, regarding the impacts that may arise from mining operations, assessment of these impacts from a risk perspective, proposed measures to mitigate the impacts and commitments or undertakings by the licence holder to implement mitigation measures.

The EMPs are reviewed in monthly site inspections, quarterly internal and external audits by independent auditors, and in annual closure-liability assessments and site inspections by the DMR. Any shortcomings will be addressed.

In addition to regulatory reporting processes, a legal register, management code of practice and sustainable-development assurance processes, Sibanye's Internal Audit department monitors legal compliance, as well as external EMP assessments.

- **Beatrix:** In 2015, the outcomes of site inspections by the DMR were predominantly positive with a high degree of compliance.
- **Cooke 1, 2 and 3:** Site inspections were also predominantly positive with a high degree of compliance in 2015. An in-house performance assessment on the EMP in August 2015 found overall compliance of 86%. The main issues of concern were waste management (separation and storage) and water management (clean and dirty water separation and stormwater infrastructure maintenance). Sibanye's Group Environmental Management function, working with mine personnel, will drive these initiatives in 2016.
- **Burnstone:** An external EMP performance assessment conducted in August 2015 found overall compliance of 74%. Hydrocarbon spill management, topsoil stockpile management and stormwater run-off management were major concerns. The project team will work with Group Environmental Management with focus on hydrocarbon spill management in 2016.
- **Kloof, Driefontein and Beatrix:** In-house EMP performance assessments are due to be conducted in the first quarter of 2016.

Sibanye reports on Level 3 (ongoing but limited impact), Level 4 (medium-term impact) and Level 5 (long-term impact) environmental incidents.

In 2015, Sibanye reported eight (2014: nine) Level 3 environmental incidents. There were three Level 3 incidents at Cooke Operations, three Level 3 incidents at Kloof and two Level 3 incidents at Driefontein. No Level 4 and 5 incidents were reported during the period under review.