

## MINIMISING THE ENVIRONMENTAL IMPACT

### OUR APPROACH

#### DUTY OF CARE

Sibanye adheres to the general environmental duty of care principle as outlined in Section 28(1) of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA). In addition, Sibanye strives to uphold 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 about, and they are encouraged to adhere to and deliver on our water and environmental management policies.

#### AWARDS AND RECOGNITIONS RECEIVED

Sibanye achieved an A rating for its 2016 Carbon Disclosure Project (CDP) climate change submission and has been included in the global A list of leaders in climate change reporters.

#### ENVIRONMENTAL INCIDENTS

Sibanye considers any environmental incident to be serious but publicly reports on Level 3 (ongoing but limited impact), Level 4 (medium-term impact) and Level 5 (long-term impact) environmental incidents. All incidents are recorded, investigated and classified as they occur. Steps are taken to mitigate and prevent any recurrence. Incidents are monitored continuously and reported internally on a monthly and quarterly basis.

In 2016, the Gold Division reported six level 3 environmental incidents (2015: eight and 2014: nine). This comprised four level 3 incidents at the Cooke operations and two level 3 incidents at Driefontein. No level 4 or level 5 incidents were reported.

The Platinum Division reported 13 incidents, all at Kroondal – five level 3 and eight level 4 incidents – since its acquisition. It is important to note that the classification system used by the Platinum Division differed from that used by the Gold Division. A process to align and standardise the reporting, recording and classification of environmental incidents across the Group is underway and will be completed by June 2017.

### PERFORMANCE

#### WATER MANAGEMENT

Total mine water consumption for the Group was 45,860MI (Gold Division: 41,484MI; Platinum Division: 4,376MI) for 2016, of which 33% was purchased from water services authorities (2015: 36%).

Consistent water consumption in the Gold Division in 2016 was a result of the implementation of the SibanyeAMANZI water strategy, which seeks to reduce the quantity of water purchased by means of water conservation and demand management initiatives as well as deployment of Sibanye's own water purification plants.

#### Water used\* and discharged (MI)

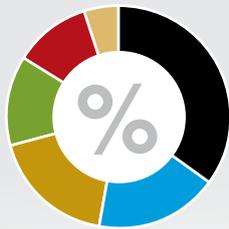
	2016			2015
	Group	Platinum Division	Gold Division	Gold Division
Water withdrawal	111,693	4,376	107,317	114,735
Water discharged	65,833	0	65,833	73,160
Water used*	45,860	4,376	41,484	41,575
Total purchased	15,027	2,674	12,353	14,795
Volumes treated (Mt)	26.8	6.6	20.2	19.9
Intensity (MI/tonne treated)	0.00171	0.00066	0.00205	0.00209

Note: Water used = total abstracted – water discharged

\* This year we report on the volume of water used rather than on the volume recycled and reused. Sibanye operates mines that generate almost zero effluent (100%) consumed and mines that must discharge certain volumes of water in terms of their water use licences to satisfy the requirements of the environmental reserve and/or to satisfy dewatering requirements. Nevertheless, Sibanye continues to practice effective water conservation and water demand management, in accordance with the requirements each of its water use licence.



### Potable water purchased by operation



■ Kloof	35%
■ Cooke	18%
■ Beatrix	18%
■ Kroondal	13%
■ Driefontein	11%
■ Rustenburg	5%

### TOTAL POTABLE WATER PURCHASED 2016

# 15,027MI

(2015: 14,795MI)

Although Cooke is a smaller operation than Kroondal, its water consumption includes that by the hostels located at the Cooke Operation. In addition, Kroondal's consumption is for nine months of the year, as opposed to a full year.



Sibanye's Water Management Department has been structured to deliver on the following key functional areas:

- **Compliance** with water use licence requirements continued to improve as a result of increased specialist interventions. Structural compliance with specific requirements of water use licences has been challenging and remains the key obstacle to achieving 100% compliance with regard to water quality. In order to address the issue, it has been decided to apply for amendments to these water use licences.
  - Underground settler treatment systems converted into cold lime softening treatment plants at four mine shafts, to facilitate metals and uranium removal, and partial desalination, are delivering satisfactory results.
  - A new water use licence was received for Kloof, which resulted in compliance cost savings as well as improved compliance.
  - The Driefontein water laboratory has been upgraded and, from 2017, the use of external laboratories will be reduced as a result.
  - Sibanye experienced an increase in inspections by the Compliance and Enforcement section of the Department of Water and Sanitation (DWS) in 2016. Two letters of intent to issue a directive were received. However, no directives were ultimately issued.
  - The team is also responsible for water quality sampling at 868 points, monitoring and submission of results to the DWS as per the water use licence requirements, which stipulate that sample points should be monitored for frequencies of surface water, groundwater and discharges.
- **Innovation and projects:** Several projects were designed and implemented during 2016.
  - **Trans-Caledon Tunnel Authority (TCTA) Western Basin acid mine drainage (AMD) treatment plant:** successful commissioning of the 30MI/d settler upgrade project and modification of the precipitation system, resulting in substantial cost savings and prevention of AMD discharges from an old decline mining shaft in Randfontein (17 winze).
  - **Kloof water treatment plants:** design and specification of several potable water treatment plants as well as a demineralisation plant to reduce dependency on supplies from water services providers and to improve feed water quality
  - **Underground lime softening plants:** modifications to dosing systems to facilitate the removal of metals and uranium from underground mine water at Cooke 1 and 2 shafts, Ezulwini and Kloof 8 Shaft
  - **Ezulwini shaft closure project:** project management and facilitation of the basic assessment and water management closure – the current cost of the pump and treatment process is approximately R13 million per month. Full shaft closure is planned for the fourth quarter of 2017. Studies have shown that rewatering of the Gemsbokfontein West compartment will produce minor risks as far as ground stability, water quality and barrier plug safety are concerned
  - **Innovation:** Sibanye received approval in terms of Section 11D of the Income Tax Act, 1962 (Act No 58 of 1962) to conduct four water management innovation projects, which include biological treatment of mine effluent and tailings, rare earth elements recovery, cyanide recovery from tailings and economical remediation of mining impacts through the recovery of minerals as part of rehabilitation
- **Operational and maintenance support:** Sibanye continues to contract and administrate purchases of potable water, water resources charges, underground settler management, cooling water treatment contracts and the operation of the TCTA AMD treatment plant, the Driefontein North Shaft drinking water plant and the Ezulwini potable water treatment plant

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

Sibanye continues to assess, optimise and document the water balance for each water use licence and submit the annual returns. We deployed a water conservation and demand management system in 2016, which provides real-time water consumption and alerts when leaks are detected. The system has already generated several real benefits, including reduced night flows, leak management and reconciliation of municipal and water board flow meters. The next phase of the system comprises the installation of instrument sensors at water plants, leak detection for tailings disposal and real time monitoring of water use licence discharges.

**Awareness and stewardship:** Sibanye hosted in an international investor conference and a technical tour for participants as well as several community visits to the Western Basin surface operation, and also participated in several stakeholder and water-management public forum meetings. Several students were assisted with post-graduate research and Sibanye participated in the Minerals Board meetings at the University of Cape Town, focusing on research and development within the mining industry.

### ACID MINE DRAINAGE

Water management activities relating to the management of AMD include:

- Extensive water quality and salt load measurement and management
- Catchment-wide biomonitoring and toxicity assessments
- Ensuring that underground lime dosing plants and cold lime softening facilities operate within specifications
- Continuing research and pilot plant work to find ways to economically recover metals from AMD water
- Operating the Western Basin Trans-Caledon Tunnel Authority AMD treatment facility at the Cooke Operations

### WATER USE LICENCES – STATUS

- Kloof received a new water use licence in 2016
- All operations, in the Gold and Platinum Divisions have current water use licences or authorisations
- Applications have been made for amendments to some of these licences and feedback from the DWS is pending
- Splitting of the single water use licence for the Rustenburg assets, in line with the new ownership of assets following the acquisition of certain of the Rustenburg assets from Anglo American Platinum, awaits feedback from the DWS

### TAILINGS AND WASTE PROGRAMME

To reduce costly double handling of lower grade development or waste material, which was previously hoisted separately and stored on surface rock dumps for future processing through dedicated surface material plants, a decision was made in 2014 to mill and process development material with underground ore at all the gold operations. As a result there is no longer a need for rock dumps on surface and existing dumps are currently being processed and removed. Significant effort has also been made to improve the quality of mining factors, such as reducing dilution by lowering stope widths. In addition, reducing dilution by minimising the amount of waste rock mined has significant cost and environmental benefits, including a smaller surface footprint, which results in lower dust emissions and more effective management of water pollution.





#### Gold Division

Waste management (Mt)	2016	2015	2014	2013
Tailings into TSFs	15.46	14.31	15.73	13.11
Tailings into pits	4.02	4.20	3.79	–
Waste rock	0.18	7.14	0.60	0.76
Recycled waste*	12.09	11.34	11.96	13.29
<b>Total mining waste</b>	<b>19.69</b>	<b>25.65</b>	<b>20.12</b>	<b>13.87</b>

\* This gold-bearing material such as the waste rock dumps that is retreated at the plant

#### Platinum Division

Waste management (Mt)	Kroondal (April – Dec)	Rustenburg (Nov – Dec)	Total 2016
Tailings into TSFs	3.36	7.34	10.7
Tailings into pits	0	0	0
Waste rock (including the Kroondal dense media separation dumps)	1.85	0.37	2.22
Recycled waste	0	0	0
<b>Total mining waste</b>	<b>5.21</b>	<b>7.71</b>	<b>12.92</b>

#### CLIMATE CHANGE, EMISSIONS AND AIR QUALITY MANAGEMENT

Sibanye's 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 and analysis is used to determine the 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 the necessary authorisations (provisional atmospheric emissions licences or atmospheric emissions licences). All operations completed setup and initial reporting of emissions in 2015 in terms of the National Atmospheric Emissions Inventory System, as required, by 31 March 2016.

Sibanye is committed to global warming and climate change initiatives through the deployment of responsible strategies and actions. Identified climate change risks include:

- Financial (application of certain policies and measures such as carbon tax)
- Business risk (introduction of sector and Group carbon budgets, Eskom electricity supply constraints and impacts on production)
- Physical (extreme events such as heavy rainfall and severe storms, hail and tornadoes which damage infrastructure)
- Supply chain (disruption of key products such as timber support with concomitant cost increases)

In order to manage these risks, Sibanye participates actively in shaping the national response to climate change by lobbying National Treasury and the DEA on policies and measures to achieve a low carbon economy. In addition, Sibanye also lobbies through institutions such as the Chamber of Mines.



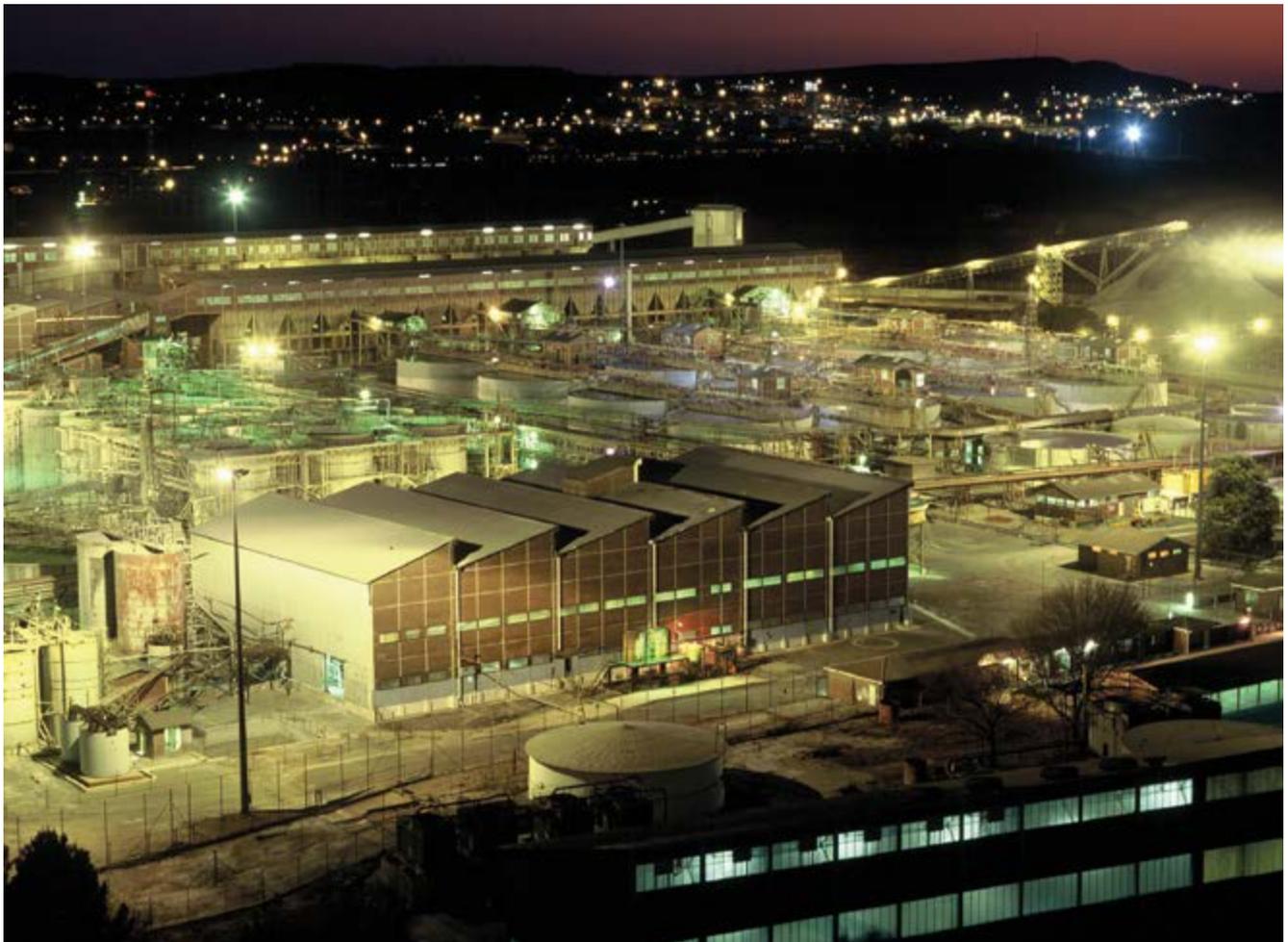
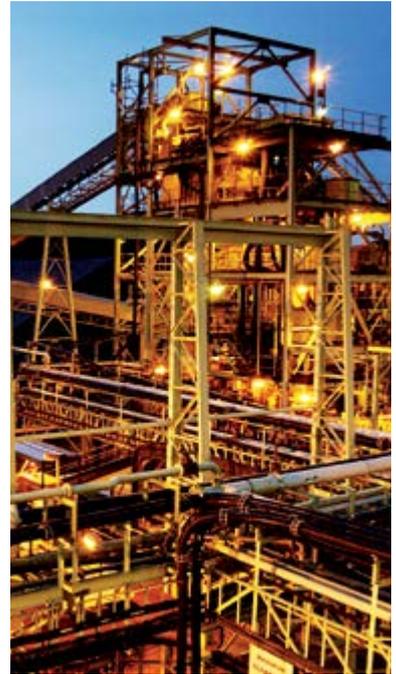
## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

In 2016, Sibanye participated in the National Business Institute (NBI) survey of adaptation to climate change by companies. The information gathered from the survey is being used by the NBI to draft a report on adapting to climate change. Changes in the physical environment are addressed through mitigation and adaptation. Mitigation measures relating to water storage and pumping infrastructure are being considered to handle extreme events and green building design is considered for new buildings.

Sibanye has embarked on a programme to raise awareness and build the resilience of its supply chain to climate change and thus minimise supply disruptions while managing product costs. In this regard, a meeting was held with our key timber supplier. The timber supplier is aware of the potential effects of climate change and manages its climate change risk by diversifying the geographical spread of its timber growing areas and holding prepared timber inventories in strategic areas.

Climate change also offers opportunities which Sibanye plans to harness, including revenue recycling opportunities through projects aimed at integrated electricity demand management (formerly demand side management projects) either partially or fully funded by Eskom and through tax incentives for low carbon intensive processes such as those included in Section 12L of the Income Tax Act.

In order to actively manage its carbon emissions, Sibanye carries out a detailed assessment of its Scope 1, 2 and 3 emissions (carbon inventory). The inventory is compared to the established base year and to short-, medium- and long-term targets.



Sibanye has also undertaken to align targets using the science-based sectoral decarbonisation approach. Our emissions are summarised below.

### Scope 1 and Scope 2 (direct emissions) carbon inventory (000t CO<sub>2</sub>e)

	Unit	2016			2015	2014	2013
		Group	Platinum Division	Gold Division	Gold Division	Gold Division	Gold Division
Scope 1 (excluding fugitive mine methane)	t	116	18	99	94	110	62
Scope 1 (fugitive mine methane)	t	596		596	650	660	572
Scope 2	t	4,720	557	4,163	4,272	4,405	3,774
Scope 3	t	1 029	180	849	867	863	634
CO <sub>2</sub> e intensity	tCO <sub>2</sub> e/tonne milled	0.22	0.12	0.24	0.25	0.28	0.32

The 2016 carbon emissions include emissions from the acquisitions as of the time they became effective (i.e. Kroondal from April 2016 and the Rustenburg Operations from November 2016)

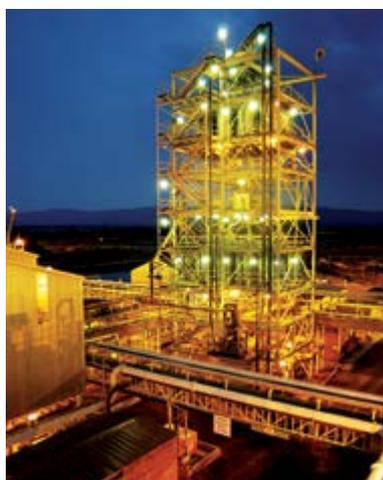
Emissions from 12 of the 15 Scope 3 categories have been included for the Gold Division as follows:

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 waste water 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. Downstream transportation and distribution: CO<sub>2</sub>e emissions associated with transportation of product from Sibanye to refinery
9. Processing of sold products: CO<sub>2</sub>e emissions associated with smelting and refining gold
10. End-of-life treatment of sold products: CO<sub>2</sub>e emissions associated with smelting gold to repurpose the product
11. Downstream leased assets: CO<sub>2</sub>e emissions associated with the leasing of houses to mine workers where emissions are generated from electricity use
12. Investments: CO<sub>2</sub>e 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

The following Scope 3 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
- Upstream leased assets: no significant upstream leased assets identified

The collation and integration of the platinum operations scope 3 emissions began during the 2016 calendar year. Scope 3 data for 2016 have been collated and reported primarily on the following categories: purchased goods and services; capital goods; fuel- and energy-related emissions not included in Scope 1 or Scope 2; upstream transportation and distribution; waste generated in operations; and employee commuting



### REDUCING ENERGY CONSUMPTION

Energy-efficiency initiatives were implemented across the Group in 2016 in line with Eskom's demand-side management programme and Sibanye funded projects to the value of around R50 million to reduce electricity consumption by 2% to 3% annually. Employees are encouraged to conserve energy and energy service companies were employed to assist with energy-saving measures, contributing to energy savings of 15.5MW in 2016 (2015: 15.8MW). The cost benefit totals approximately R76 million.

In agreement with Eskom, Sibanye continues load shifting to protect the national grid at peak times and to manage peak power costs.

Our energy and carbon footprints are measured, monitored and managed in terms of our integrated energy and carbon management strategy. It has been found that electricity consumption contributes approximately 87% to Sibanye's total Scope 1 and Scope 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.

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

Sibanye continues to design, develop and implement strategies that seek to reduce the energy consumption of operations and, thereby, reduce its carbon footprint while additional opportunities and energy-efficient technologies are pursued.

The Beatrix carbon-reduction project, which includes the use of methane gas to generate electricity, registered under the Clean Development Mechanism of the Kyoto Protocol to the United Nations Framework Convention on Climate Change in 2013, accrued 28,281 certified emission reductions in 2016 (2015: 89,290). Certified emission reductions (also known as carbon credits) are issued by the Clean Development Mechanism to assist organisations in offsetting their emissions and complying with their targets. During 2016, the depletion of methane emissions from boreholes and vandalism of flares contributed to a decrease in the number of certified emissions reductions.

Regarding the Platinum Division, we will assess existing projects and the way forward in 2017.

### Gold Division – Energy intensity (GJ/tonne milled)

	2016	2015	2014	2013
Beatrix	0.69	0.73	0.69	0.70
Cooke	0.43	0.76	0.77	–
Driefontein	0.89	1.03	1.09	1.08
Kloof	1.15	1.56	1.36	1.36

### Group emissions – NOx and SOx (t)

	2016	2015	2014	2013
Nitrogen oxides (NOx)	887	618	19,901	14,618
Sulphur oxides (SOx)	667	499	632	464

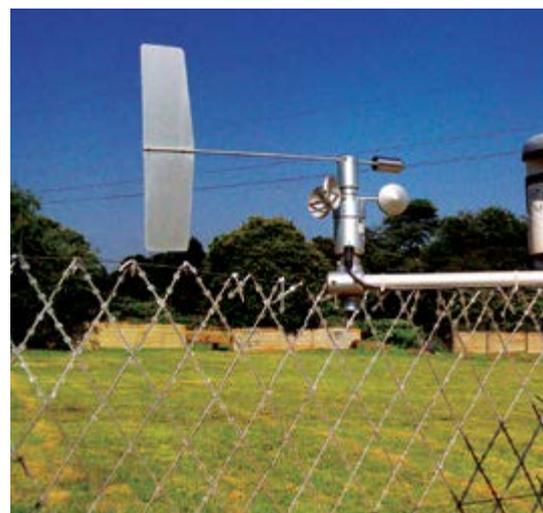
### SOLAR ENERGY

A prefeasibility study completed in 2014 confirmed that solar photovoltaic power would be an economically competitive solution and could partially ameliorate the effects of interruptions in Eskom supply. A 150MW photovoltaic plant is planned for development on a site strategically placed between the Driefontein and Kloof mining complexes on the West Rand.

Photovoltaic generation from a site adjacent to Sibanye's mining operations represents a partial solution to securing alternative electricity supply and allows the power generated to be directly injected into the mine's electrical reticulation. The first phase of 50MW is planned to be operational in the second half of 2018. This technology can be implemented over a relatively short time while baseload solutions will be required to complement photovoltaic power for a more comprehensive approach. Once complete, it will be the single largest private offtake plant on the African continent.

Significant progress was made in 2016 with the project team completing many of the key milestones required to ensure commercial operation in 2018. All environmental authorisation applications, including an environmental impact assessment and a water-use general authorisation, were submitted to the relevant regulatory bodies for consideration – provisional approval was obtained from the Department of Environmental Affairs in January 2017 with approval from the Department of Water and Sanitation expected in the first quarter of 2017.

An engineering concept and basic design were completed, providing critical information required for the environmental permitting and financial modelling of the project. In support of the design, all the required geotechnical work was also conducted. Applications to Eskom, for technical approval, and the Department of Energy, for regulatory approval, have been submitted with the outcomes expected by April 2017. An application to the National Energy Regulator of South Africa for a generation licence will be made once approval has been received from the Department of Energy.





To execute the project, Sibanye has elected to run a competitive tender process to appoint a project developer who will build, own and operate the project, and sell power back to Sibanye through a power purchase agreement (PPA). This approach has no upfront capital requirement for the business and allows capital to be prioritised for core mining projects. The tender has been successfully run, enabling a significant forecast return to Sibanye over the course of the agreement. The preferred project developer will be announced in the first half of 2017.

In 2017, the final milestones will be reached, allowing the project to move to construction phase in the second half of the year. The most significant of these milestones will include the conclusion of the PPA negotiations with the preferred bidder and Board approval of the agreement. The final regulatory approvals will be required prior to financial close, at which stage construction may begin. Although the project team carefully manages these, external approvals remain the biggest threat to the implementation and timelines of the project.

The project team is confident that the project will be a success and provide a suitable solution to alternative energy supply while deriving commercial benefit. Initial estimates are that it will reduce our carbon consumption by around 128,000tCO<sub>2</sub>e per 50MW phase.

#### DUST

Three dust-related complaints were received during 2016 – two at the Cooke Operation and one at our Driefontein Operation. Nor were any air quality complaints made by the community to the Platinum Division in 2016, although there were several incidents of dust exceedances (see the 2016 summary of environmental incidents). Furthermore, the Platinum Division is not required to have an air emissions licence.

#### Gold Division

Dust control techniques deployed at various sources have been informed by site-specific conditions. For example, at certain dormant tailings dams, ridge ploughing and wind break netting have been installed and maintained and at certain operational areas dust suppression water sprays have been installed.

#### Platinum Division

Surface dust levels at our operations were above legislated limits at the main mine road, K150 tailings dam, Klipfontein and the haul road in 2016. Exceedances were mainly due to extremely dry weather.

Although a sprinkler system has been installed at the K150 tailings dam, it is not entirely effective given the dry weather. Dust on the haul roads is suppressed by water tankers twice daily. At the Klipfontein tailings dam, trucks travelling near the dust bucket are causing dust exceedances. The main mine road dust bucket is situated next to tanker services where dust suppression as well as monitoring has been recommended to determine the effectiveness of this action plan.

#### Air quality complaints

Gold Division	2016	2015	2014	2013
Beatrix	0	1	1	0
Cooke	2	1	1	0
Driefontein	1	2	1	1
Kloof	0	3	0	0
<b>Total</b>	<b>3</b>	<b>7</b>	<b>3</b>	<b>1</b>

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

### MATERIALS CONSUMED

#### Materials consumed (tonnes)

	2016	2015	2014
<b>Gold Division</b>			
Timber	110,524	163,722	104,468
Cyanide	11,967	11,924	11,758
Explosives	6,768	7,854	4,175
Hydrochloric acid	4,414	3,773	3,579
Caustic soda	2,674	3,421	2,947
Lime	76,556	68,128	39,843
Cement <sup>1</sup>	42,865	41,101	38,579
Diesel (kl)	7,097	6,410	6,274
<b>Platinum Division*</b>			
Timber	82		
Explosives	7,046		
Alkali agents	65		
Cement <sup>1</sup>	1,513		
Diesel (kl)	3,325		
Lubricating and hydraulic oil (kl)	7,777		
Grease (kl)	19		

\* The Platinum Division includes those operations under management. Kroondal (50%) is included for the nine months from April to December 2016 and the Rustenburg Operation for two months, November and December 2016

<sup>1</sup> Includes all categories of cement and cement mixtures

### CYANIDE

The use of cyanide, the primary reagent for leaching gold from ore, has associated environmental and health risks. Sibanye has adopted the International Cyanide Management Code for the manufacture, transportation and use of cyanide in the production of gold. Sibanye purchased 11,967t of cyanide in 2016 (2015: 11,924t).

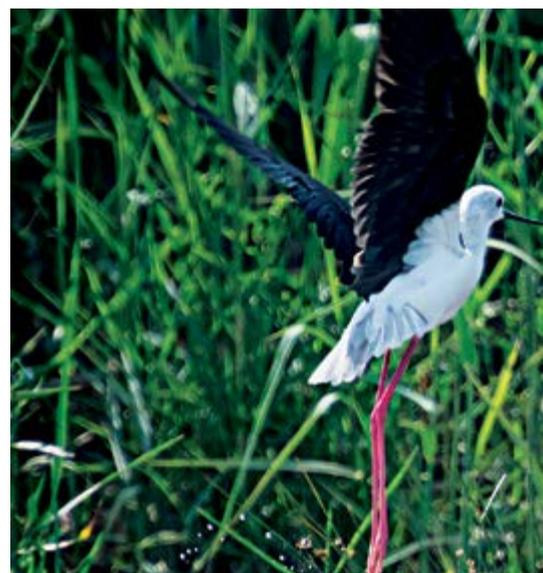
### LAND MANAGEMENT AND REHABILITATION

Total land under Sibanye's management in the Gold Division in 2016 was 50,316ha. The cumulative total of land disturbed by mining and related activities in 2016 was 17,359ha, equivalent to 34% of all the land managed by the Gold Division. Much of the land under management is agricultural where no mining takes place.

Kloof's biodiversity management plan was finalised and the assessment for Beatrix was completed with the management plan due to follow in 2017. In addition to the Kloof plan, a karst/cave study was conducted on the Kloof property to identify and map possible new karst/cave systems. The study resulted in the discovery of three entirely new cave systems, the re-investigation of the known cave systems and inspection of 78% of all current sinkholes. The Kloof caves provide roosting and overwintering habitat for a number of bat species as well as an important nesting habitat for the barn and spotted eagle owls. Conservation important species identified include the Geoffroy's horseshoe and Natal long-fingered bats.

Phase 2 of a potential soil contamination study for Kloof and Driefontein began during 2016. Soil samples were taken at areas identified during the first phase. The study is in its final stage and results of the analysis are currently being reviewed and incorporated into a management plan. Finalisation of the study is due by the end of March 2017, following which the management plans will be implemented.

In the interests of sustainable development, land management and legal requirements, alien vegetation is removed through local economic development projects at the Kloof, Driefontein and Cooke operations. Alien invasive permits for Kloof and Driefontein were renewed in 2016 and a detailed management plan was compiled for the eradication of alien invasive plants.





Focus will be on high priority areas, primarily the containment and eradication of Category 1 species, in terms of the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983), and Category 1b species, in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004).

No protected areas were identified at any of the West Wits and Free State operations.

A detailed heritage resource assessment was conducted for Kloof and Driefontein, and a management plan compiled.

The Gold Division's total closure liability is assessed annually by a recognised independent consultant, and is funded by trust funds and insurance guarantees. Closure liability as at 31 December 2016 was R4,120 million (2015: R3,817 million).

Total land under Sibanye's management within the Platinum Division, and disturbed by mining and related activities at the respective mines, is 25,954ha.

All sites within the Platinum Division have completed biodiversity action plans as well as alien invader eradication programmes.

Total closure liability for our platinum assets is funded by trust funds and insurance guarantees closure liability as at 31 December 2016 for the platinum operations totalled R2,026 million and covers Kroondal, Marikana, Blue Ridge and the Rustenburg Operations.

#### ENVIRONMENTAL PERMITTING AND COMPLIANCE

In line with the environmental management system, each gold operation has an approved environmental management programme, which is a formal contract between Sibanye, as the holder of the mining right, and the regulator, the DMR, regarding 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 environmental management programmes are reviewed during 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 are addressed through appropriate action plans.

In addition to regulatory reporting processes and sustainable development assurance processes, Sibanye's Internal Audit department monitors legal compliance, as well as performance against environmental management programme commitments.

During 2016, internal environmental management programme performance assessments were conducted at Kloof, Driefontein, Cooke and Beatrix. Overall, environmental management programme compliance was found to be, on average, 90%. Action plans have been put in place to address the gaps. A particular focus will be on finalising management plans for soil, land use and heritage with an emphasis on dust management, regular dam wall and pipeline inspections and completion of annual independent audits of historical environmental authorisations for fridge plants and diesel generators.

During 2016, the DMR conducted annual independent compliance audits at Kloof, Driefontein, Cooke and Beatrix. The department delivered a notice of intent to issue a compliance notice to our Kloof and Driefontein operations with regard to the addition of VAT to current closure provisions. A response has been drafted and submitted to the department, to which a final response is awaited.

During 2016, environmental impact assessments and associated permitting processes for the proposed WRTRP, and the proposed photovoltaic project, were completed and submitted to the relevant competent authorities/regulators for approval. In early January 2017, an environmental authorisation was received for the photovoltaic project and its associated transmission infrastructure.

During 2016 in the Platinum Division, external environmental management programme performance assessments were conducted at Kroondal, Marikana and related PSA areas.

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

The related reports were received in November 2016 noting compliance of at least 90%. Additional focus will be placed on those aspects highlighted in the reports that require attention in terms of compliance.

At Rustenburg, no external environmental management programme performance assessment had been conducted prior to 1 November 2016. Owing to time constraints, a formal request for an extension for the submission of the related report was made to the DMR on 9 December 2016.

### FUTURE FOCUS

Sibanye has made significant strides in ensuring that environmental issues are fully integrated into its core business, and to remain legally compliant. Opportunities for optimisation will be identified and harnessed to reduce costs through innovation to offset our long-term closure liability. In 2017 and beyond, Sibanye will focus on:

- improved waste management practices
- revival of environmental management systems
- readiness to deal with ongoing and emerging legal compliance issues, including conditions of approval for licences and permits
- playing a greater role in industry environmental forums to ensure that pertinent issues are addressed
- alignment of incident classification and reporting across the business to reduce environmental incidents

Sibanye plans to focus on four key areas in order to meet its water management objectives:

- Water management systems: expansion of the water management system will include real-time water quality data and flow metering for process control, further development and Group roll out of the Mine Environmental Management Decision Support System (MEMDSS)
- Water security and independence: amending water use licences in order to obtain regulatory approval to replace municipal potable water with our own production facilities
- Mine closure management: develop mine-based and regional closure plans, considering innovative approaches with regard to socio-economic closure, and determine the water management cost of mine closure
- Optimal water use licence compliance: review all water use licences in order to establish change required and/or treatment facilities to be considered in order to target 100% compliance

