

## MINIMISING THE ENVIRONMENTAL IMPACT



### MESSAGE FROM THE CEO

“As a responsible corporate citizen, we aim to minimise our impact on the environment and support economic activity once mining has ceased.”

**Neal Froneman** – Chief Executive Officer

### APPROACH TO ENVIRONMENTAL MANAGEMENT

At Sibanye-Stillwater we manage, limit and attempt to mitigate any environmental impacts caused by our mining activities. We apply the duty of care principle as outlined in national environmental legislation, while striving to maintain the highest environmental standards. We comply with all relevant legislation governing the use of resources, most notably water, responsible waste management, conservation of biodiversity, and post-mining land use for socio-economic closure, both in southern Africa and in the United States.

The Sibanye-Stillwater Environmental Policy was aligned with the Sibanye-Stillwater operating model during 2017. A new environmental vision, Environmental Vision 2020, was crafted and has been implemented for the SA region in 2017, taking into account the structural and organisational changes following the acquisition of the SA PGM assets and their integration within the company. Internal organisational restructuring included amalgamating the previously-separate environmental and water management departments into one, integrated environmental function for the SA region.

The new Environmental Vision 2020 covers all the Sibanye-Stillwater mining operations across different jurisdictions and supports superior value creation for all stakeholders. Components of the vision, where applicable, will be applied to the US region. This vision, and the related policy, aim to improve lives through responsible environmental management practices and include, inter alia, verifiable compliance, risk management and environmental and water footprint management in anticipation of post mining socio-economic closure.

### APPROACH TO ENVIRONMENTAL MANAGEMENT IN THE UNITED STATES REGION

The US region has a long history of environmental and social collaboration with local communities and interest groups that is rooted in the Good Neighbours Agreement (GNA), which is an innovative framework for protecting the natural environment while encouraging responsible economic development. The GNA legally binds the Company to certain commitments and holds the Company to higher standards

than federal and state regulations require. These commitments include regular, transparent, and productive interaction with all affected stakeholders, primarily the three local stakeholder organisations—Northern Plains Resource Council, Stillwater Protective Association, and Cottonwood Resource Council.

These organisations generally speak for local residents who live in the areas immediately adjacent to the mines. Representatives of the organisations meet regularly with the Company to discuss operations, future planning, and other issues, including direct impacts on local communities, such as traffic volumes. This framework provides a mechanism for the general public to voice concerns and to become informed on our operations. Under this framework, the US region has generally been able to achieve a greater level of certainty related to external risks and has generally avoided certain litigation that is more common among our mining peers in the region.

### PERFORMANCE 2017

The Environmental focus during the year has been characterised by the development of action plans following the alignment of the respective SA gold and SA PGM teams around a common purpose and vision. Delivery of the strategic objectives will only be effective if the purpose and vision are translated into useable operational plans supported by enabling technologies. This has remained our focus, creating the platform for execution and delivery in 2018. During the year 25 key environmental procedures between our SA gold and SA PGM operations were revised and merged. This together with training is an important step to ensuring a common approach to the application of environmental standards across the Group.

Environmental awareness training is an integral aspect of communication with employees who are encouraged to abide by and deliver on our various water and environmental management procedures. Regular environmental communication sessions are held at the operations to emphasise that responsible environmental management is the duty of each Sibanye-Stillwater employee. The Sibanye-Stillwater leadership and line management commit to the implementation of the environmental management policies and procedures, through effective and visible felt leadership on environmental management issues. The environmental management sessions

also highlight the environmental impact of mining activities as well as impressing on employees the importance of compliance with environmental legislation pertaining to various environmental aspects such as water, air and waste.

This integrated and aligned approach has also seen significant progress in the improvement of overall compliance as well as water conservation and demand management initiatives.

The environmental team has been proactive in reviewing and commenting on legislative policy and regulatory changes including financial provisions for closure and Carbon tax, through the Chamber of Mines. These regulatory changes have been identified as a risk to our business as discussed below. The current action plans, developed as part of the vision alignment, have been developed to mitigate these risks.

## ENVIRONMENTAL RISKS

The most significant environmental risks have been integrated into Sibanye-Stillwater's enterprise-wide risk management process. These top risks and associated mitigation action plans and strategies in the SA region are as follows:

Risk	Mitigating action plans and strategies
<p><b>Environmental impact on water catchment areas</b></p>	<p><b>Context:</b> Sibanye-Stillwater conducts mining operations in accordance with mining legislation including the National Water Act and our water use licence (WUL). As part of our daily operations Sibanye-Stillwater has permitted discharges into a number of catchments. As responsible corporate citizens we are duty bound to understand the impact of our mining on the various catchment areas:</p> <ul style="list-style-type: none"> <li>• Ongoing and comprehensive water monitoring programmes (our sampling and monitoring programme has 865 sampling points – Au-435; Pt-430) and we report regularly on the results, as required by the Department of Water and Sanitation (DWS)</li> <li>• A dedicated compliance team focuses solely on ensuring that we understand any compliance gaps, and put in place action plans to address any deviations from the acceptable limits prescribed in the WUL</li> <li>• Increased use of technology and systems to pro-actively assist us with compliance management. PIVOT is the Sibanye-Stillwater incident management system</li> <li>• Participation and involvement in catchment forums, as constituted by the DWS for the different catchments. These forums are mostly attended by all DWS sub-directorates, DMR, National Nuclear Regulator (NNR), Gauteng Department of Agriculture and Rural Development (GDARD), Department of Environmental Affairs (DEA) as well as major water users, NGOs, local and district municipalities, Rand Water and any other affected or interested party</li> </ul>
<p><b>Compliance with permits and authorisations</b></p>	<p><b>Context:</b> Sibanye-Stillwater's operations in the SA region are governed by three acts – these are the MPRDA, the National Environmental Management Act 107 of 1998 (NEMA) and the National Water Act of 1998 (NWA). Licences and authorisations are granted with a myriad of stringent conditions. We operate in a dynamic environment and must comply with all conditions in order to retain our licence to operate. Applications for amendments as a result of changes in mining activities take time to authorise.</p> <ul style="list-style-type: none"> <li>• Application are made for amendments to Environmental Authorisations (EA), Environmental Management Programmes (EMPs), Atmospheric Emissions Licences (AELs), WULs, etc. to authorise listed and other activities, as well as to re-negotiate more realistic and achievable licence conditions</li> <li>• Scheduled internal inspections and reports constantly gauge compliance levels</li> <li>• Occurrence management procedures in place to log, manage, report on and action environmental occurrences (including non-conformances, incidents and complaints)</li> <li>• Scheduled internal and external WUL and EMP audits to assess compliance and rectify where needed</li> <li>• Extensive and comprehensive environmental monitoring to measure compliance levels and benchmark against permit conditions</li> </ul>

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

Risk	Mitigating action plans and strategies
<p><b>Impact of new and emerging legislation (where the 'voice' of industry has had little influence) on Sibanye-Stillwater's operations and long-term sustainability</b></p>	<p><b>Context:</b> Environmental legislation in South Africa is constantly evolving, and complying may have material impacts on how Sibanye-Stillwater conducts its business, for example, the revised November 2017 NEMA Regulations on financial provisions (FP) for rehabilitation and closure. The main points of contention with the revised FP Regulations are:</p> <ul style="list-style-type: none"> <li>• The proposed inclusion of 15% VAT on financial provisions for closure</li> <li>• The proposed inclusion of CPI+2% for the same financial provisions</li> <li>• The onerous auditing and reporting requirements</li> </ul> <p>In order to influence the context and content of the proposed revised FP Regulations, the following are being implemented:</p> <ul style="list-style-type: none"> <li>• Pro-active advocacy and engagement with Government when drafting new legislation, to actively influence the final outcomes, which include litigation options</li> <li>• The Chamber of Mines, in close cooperation with Business Unity South Africa (BUSAs), is spearheading the mining industry's comments on and influence into the draft FP Regulations, on behalf of and with inputs from the respective mining companies</li> </ul>
<p><b>Reliance on municipal water and the significant costs to the operations</b></p>	<p><b>Context:</b> Sibanye-Stillwater purchases municipal drinking water at significant expense. Sibanye-Stillwater purchased 18,284ML of water at a total cost of R230.9 million for 2017. To address this:</p> <ul style="list-style-type: none"> <li>• Sibanye-Stillwater has embarked upon a municipal water independence strategy, assuming that our water use licence applications (WULAs) will be successful where needed</li> <li>• The construction of water treatment facilities to substitute municipal potable water supply, with long term supply to municipalities as a socially sustainable closure strategy is being investigated</li> <li>• Sibanye-Stillwater is implementing initiatives to reduce consumption and cost including: <ul style="list-style-type: none"> <li>– Increasing treatment capacity of Driefontein Water Treatment facility to achieve monthly saving of R1.2 million by end of Q3 2018</li> <li>– Engagement with water supply authorities supplying Kloof 3 shaft to renegotiate tariffs for monthly cost saving of R337,000 by Q4 2018</li> <li>– Blending Facility at Kloof 10 Shaft to substitute localised potable water consumption with 30%, assuming current water quality does not deteriorate</li> <li>– Centralised Kloof Water Treatment Facility to supply full consumption of 13.98ML/d at 50% of current supply cost of R14.14m<sup>3</sup> from municipality</li> <li>– Investigate possibility of borehole supply to Cooke plant to substitute current potable water cost of approximately R550,000 a month</li> <li>– All initiatives are subject to timeous approvals from necessary regulatory bodies</li> </ul> </li> </ul>

Particular environmental risks in the US region include water and air quality management which are discussed in the relevant sections below.

## ENVIRONMENTAL COMPLIANCE

### ENVIRONMENTAL COMPLIANCE

Significant progress was made in delivering on our environmental commitments in the past year in the SA region. In addition to the Environmental Vision 2020 and strategy developed early in 2017, headway was made on the development of the multi-disciplinary environmental incident management system which will be rolled out to the SA region during 2018.

While all environmental incidents are considered serious, Sibanye-Stillwater publicly reports on level 3 (short-term impact), level 4 (medium-term impact) and level 5 (long-term impact) environmental incidents.

All incidents are recorded, investigated and classified with steps taken to mitigate potential impacts and prevent any reoccurrence. Incidents are classified, monitored and reported internally on a monthly basis. A concerted effort was made to standardise and align the definitions and classification of environmental incidents across the SA gold and SA PGM operations in the SA region, and more recently in the US region. In the SA region, this has resulted in a more effective approach to the closing out of incidents and correctly reporting to the regulators as per the WUL and GN704 (regulations promulgated in terms of the National Water Act No 36 of 1998) requirements.

In 2017, in the SA region, no level 4 or 5 incidents were recorded, with a respectable 37% decrease in the number of level 3 incidents. Twelve level 3 incidents were reported during the year, of which nine were reported at the gold operations and three at the SA PGM operations. All but two of these incidents have been closed out as they required long lead time action.

The decline in incidents reported followed the introduction of a more pro-active approach to identify potential hotspots and the causes of such incidents. In addition to in-depth root cause analyses, there was detailed planning on implementing the most effective corrective and preventative action plans. In particular, operations were advised on what preventative measures were to be implemented to prevent spillages or a level 2 incident from becoming a level 3. This led to a more proactive approach to water balance management, including real-time monitoring of dam levels and spillage predictions, taking into account short-and medium-term weather forecasts, cleaning of silted dams during the dry season to create more storage capacity and improving return pump capacities. Constant liaison with and advice to the operations was crucial in achieving this success, as well as their willingness and ability to implement these measures.

In the US region, a total of six level 3 and higher environmental incidents are reported of which three were carried over from previous years as reoccurring events. Two of the three new incidents recorded in 2017 were subsequently closed out while the remaining event will be closed later this year.

Above average rainfall in the SA region during the year resulted in spillages mostly at the return water dams. These spillages accounted for nine of the twelve level 3 incidents. Following a root cause analysis, a proactive approach to water balance management, including real-time monitoring of dam levels, cleaning of silted dams during the dry season to create more storage capacity and improving return pump capacities was instituted. The remaining level 3 incidents relate to cattle mortalities, as a result of a slurry spill due to pipe vandalism and mine water spills from various sources.

Twenty-two major non-conformance notices were issued during 2017, largely related to exceedances of the dust fall out limits as measured by our dust monitoring programmes. The dust exceedances largely relate to the increase in transportation of surface material for retreatment and footprint rehabilitation (largely at the SA PGM operations). An air quality assessment has begun to identify high risk areas and activities as well as to recommend effective dust abatement measures.

A further two major non-conformance notices were issued for water quality compliance at Cooke, details of which follow in Water quality compliance.

For further detail on these incidents, refer to the Environmental incidents summary on the website at [www.sibanyestillwater.com](http://www.sibanyestillwater.com)

### DUST (SA REGION)

Dust management forms an integral part of the Sibanye-Stillwater environmental policy statement where the company commits to proactive air quality management using nationally prescribed methodologies. Control of dust from tailings storage facilities (TSFs) is a key focus as TSFs have been identified as a significant contributor of PM10 emissions (particulate matter with a size diameter of 10 micrometers or less. Dust particles of this size are small enough to get into the lungs). Particular attention is paid to those tailings facilities where the volume of wind-borne dust has reached higher-than-normal levels during the year.

Six dust complaints were received during 2017 compared with three dust complaints in 2016. Contributing factors to the higher number of complaints in 2017 is the increase in surface activities and the comparatively hotter and drier weather conditions that experienced during 2017. All dust complaints were recorded and investigated. Effective dust suppression measures were implemented to reduce the observed dust levels.

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

### AIR QUALITY COMPLIANCE

Sibanye-Stillwater (SA region) has a requirement to standardise air quality monitoring across all operations.

Following comprehensive internal and external environmental compliance monitoring audits, one instance of air quality non-compliance with Sibanye-Stillwater's air emissions protocols was observed. An internal audit inspection of the Cooke metallurgical gold plant found that the Cooke plant kilns and smelter had been operating without an approved atmospheric emissions licence. An action plan was immediately instituted and the authorities notified. An application for a provisional atmospheric emissions licence has been lodged.

All operations holding atmospheric emissions licences completed the annual reporting of emissions on the National Atmospheric Emissions Inventory System, as required, by 31 March 2017. In addition, the gold operations submitted reports on the National Atmospheric Emissions Inventory System under the "mines and quarries category". The registrations of the PGM operations on the National Atmospheric Emissions Inventory was completed in 2017 and reporting of 2017 emissions is scheduled to be completed by 31 March 2018. Registration and reporting on emissions from the Cooke plant will also be completed by 31 March 2018. New regulations were promulgated in April 2017 regarding registration and reporting on greenhouse gases at company-level. To this effect, Sibanye-Stillwater has submitted its application for registration as a data provider. The first report will be completed and submitted by 31 March 2018.

In the US region, environmental compliance is aimed at reducing environmental impacts by implementing compliance plans and innovative technologies that allow operation well within regulatory requirements. Progress continues on environmental support of mine expansion in the US region.

### WATER QUALITY COMPLIANCE

Sibanye-Stillwater's vision for water management is to create value for all stakeholders through the optimal management of the water resource and our water infrastructure, ensuring water safety, security and regulatory compliance by the effective use of knowledge and innovative technology.

During 2017, procedures were developed to drive the water management vision. In addition, all water use licences were reviewed to identify the need for amendments to achieve total compliance.

Overall water quality compliance with our licenced mine water discharges was good, with the exception of our Cooke operations where compliance with the discharge limits remains a challenge. Action plans have been put in place to achieve

optimal pH control at the underground settlers to ensure effective and consistent metal removal. During 2017, a new water use licence (WUL) application for the Cooke operations was submitted requesting more realistic and achievable WUL limits. The proposed revision to the licence conditions will better reflect the water quality complexities of the Cooke discharge basin. The request for a revised WUL follows the success at Driefontein where there has been improved water quality limit compliance, as a result of an amendment to the WUL. Water quality discharge compliance into the Wonderfonteinsspruit improved from 70.3% to 95.5%. The Cooke WUL is expected to be issued in 2018.

The waste water treatment works also achieved good compliance, however nutrient and bacteriological compliance with unrealistic WUL limits remains a challenge. Sibanye-Stillwater has applied to amend the erroneous WUL limits and has instituted more stringent operational controls and monitoring to achieve better compliance.

All the operations in the SA region have valid WUL or old order water use authorisations.

## LAND MANAGEMENT, REHABILITATION AND CLOSURE

### LAND MANAGEMENT

To mitigate impacts that may arise from mining operations, Sibanye-Stillwater's activities are monitored constantly in terms of EMPs, approved by the DMR. In the interests of legal requirements, sustainable development, land and waste management, alien vegetation initiatives and Biodiversity Action Plans (BAPs) will be developed for all our operations.

BAPs have been completed for the PGM, Kloof and Driefontein operations. Biodiversity assessments and BAPs for the remaining operations will be completed during 2018.

Currently alien and invasive vegetation is removed through a local economic development projects to ensure continuous compliance with the EMPs.

Heritage assessments are conducted for the development of all EMPs. The assessments are then conducted on an ad hoc basis should a special need be identified including, demolition, closure or new project development.

No protected areas were identified within the South African operations as per the Protected Areas Act (No. 57 of 2003), however, ecologically important areas such as ridges, wetlands and cave systems have been identified and will be managed as required.

## WASTE MANAGEMENT

The enforcement of sound waste management practices including monthly waste management meetings with waste contractors as well as visible felt leadership sessions on waste management opportunities continued to see improvements at our SA operations. Large quantities of scrap metal, old and obsolete pipes, unused metalliferous equipment as well as old timber was removed and disposed of by the salvage and reclamation teams, which contributed to on-site waste reduction initiatives and house-keeping practices. There was also a focus on the correct storage of hazardous waste within the appropriately banded areas at the various operations. A draft group-wide hazardous waste management procedure has been developed and will be signed off for implementation in 2018. The income from recycling scrap steel in 2017 increased by 27.4% compared to 2016. The total domestic waste volume to landfill reduced significantly with the Kroondal realising a 28.6% reduction.

### Waste management (Mt)

	2017				2016	2015	2014	2013		
	Group	United States <sup>1</sup>		SA region	Group	SA region	SA region	SA region		
		PGM	Gold						PGM <sup>3</sup>	Gold
Tailings deposited TSFs	<b>32.70</b>	<b>0.39</b>	<b>17.05</b>	<b>15.26</b>	26.16	10.7	15.46	14.31	15.73	13.11
Tailings into pits	<b>3.27</b>	<b>0</b>	<b>0</b>	<b>3.27</b>	4.02	0	4.02	4.20	3.79	–
Waste rock	<b>3.39</b>	<b>0.87</b>	<b>12.52</b>	<b>0</b>	2.40	2.22	0.18	7.14	0.60	0.76
Recycled waste <sup>2</sup>	<b>11.45</b>	<b>0</b>	<b>0</b>	<b>11.45</b>	12.09	0	12.09	11.34	11.96	13.29
Total mining waste	<b>39.36</b>	<b>1.260</b>	<b>19.57</b>	<b>18.53</b>	32.61	12.92	19.69	25.65	20.12	13.87

<sup>1</sup> For the period May to December 2017

<sup>2</sup> Gold-bearing material such as waste rock dumps are retreated at the plant

<sup>3</sup> The 2016 SA PGM operations represent nine months for Kroondal and two months from the Rustenburg operations



## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

### WEST RAND TAILINGS RETREATMENT PROJECT

Sibanye-Stillwater announced on 22 November 2017 that it had entered into various agreements with DRDGOLD in terms of which, Sibanye-Stillwater will exchange selected surface gold processing assets and TSF for c.265 million newly issued DRDGOLD shares. Once the transaction has been concluded, Sibanye-Stillwater will hold 38% of DRDGOLD's issued share capital.

The transaction will allow Sibanye-Stillwater to immediately crystallise c.R1.3 billion in value from the plant infrastructure and TSFs that form part of the West Rand Tailings Retreatment Project (WRTRP), while retaining upside to future growth in DRDGOLD. Partnering with DRDGOLD to further develop the WRTRP presents an opportunity to grow an international, industry-leading, surface reclamation business. Sibanye-Stillwater's stakeholders in the region also stand to benefit from the future development of this long-life surface reclamation project. The DRDGOLD transaction is expected to close after the end of March 2018.

### WASTE MANAGEMENT IN THE US REGION

Several strategies are employed to reduce the amount of waste generated by the US operations. For example, at the Metallurgical Complex's smelter, solution from the scrubber that is used to reduce air emissions is treated in a process that converts the SO<sub>2</sub> to synthetic gypsum, which is then sold for use in agricultural operations. While, slag produced from the smelting process is returned to the mines for reprocessing rather than stockpiled at the Complex. Whereas, at the mines, the volume of surface tailings is minimised with a substantial portion of tailings being returned to the mine for use underground as backfill and for stabilisation purposes. About half of the US region's tailings are generally used as backfill each year.

The Group also minimises hazardous waste generation across US operations by optimising purchasing decisions on the front end. A committee comprised of environmental, safety, and operational employees screen new products being considered for use at Company facilities with the goal of identifying and avoiding products harmful to human health or the environment and instead purchasing safer, environmentally friendly alternatives. This process has reduced the volume of hazardous materials purchased and stocked on site.

### CLOSURE PLANNING AND LIABILITY ASSESSMENT

The legislative context for closure and rehabilitation provisioning changed in November 2015, with the introduction of Regulation 1147 (R1147), which effectively replaced the MPRDA regulations and brought the entire regime of financial provisioning for closure under the auspices of the National Environmental Management Act (NEMA, 1998) as part of an overhaul of NEMA legislation. Owing to pressure and resistance from industry at large, implementation of R1147 was suspended in October 2016 (for 39 months from the date of promulgation, until February 2019). Draft regulations were

finally published on 10 October 2017, effectively replacing R1147 and subsequent amendments. The draft regulations will significantly influence the quantum of Sibanye-Stillwater's closure provisions with the first-time inclusion of residual impacts (a significant step-change from the MPRDA), the inclusion of both a pre VAT (CPI+2% and 15% VAT) and onerous auditing and reporting requirements. Despite the parallel process to influence and change the revised draft FP regulations to more favourable terms, Sibanye-Stillwater has begun aligning processes to meet the designated target date of February 2019.

### PLANNING FOR MINE CLOSURE IN THE SA REGION

Ahead of the planned implementation of the Financial Provisioning Regulations in February 2019, much preparatory work has been done to clarify, confirm and align definitions for planning around mine closures, closure methodologies and the calculation of liability provisions. The aim is to compile a sustainable mine closure solution, the end objective of which is a sustainable socio-economic closure solution with due consideration of the water management cost of mine closure.

#### Closure of Ezulwini

Ezulwini Mining Company (EMC), a wholly-owned subsidiary of Sibanye-Stillwater, operates the Ezulwini Mine (alternatively known as Cooke 4 Shaft) on the West Rand where active mining has ceased. The pumping operation, necessary to remove 68ML/day of fissure water from the underground workings, however continues. Sibanye-Stillwater has applied to the DMR for the closure of the underground workings.

The proposed solution is to allow the natural re-watering of the underground workings and the consequent recovery of the Gembokfontein West dolomitic compartment, which will reinstate the natural flow of the Gembokfontein eye into the Wonderfonteinspruit with good quality dolomitic water. To achieve the closure objectives, it was necessary to isolate the Gembokfontein West compartment by installing three concrete plugs between Cooke 3 and Ezulwini. Construction of these plugs began in May 2017 and their completion is planned for the middle of 2018. Five plugs, between South Deep and Ezulwini, were installed by Gold Fields' South Deep mine between 2003 and 2005, as part of an earlier closure of Ezulwini. Extensive investigation into the stability and predicted long-term operating performance of the plugs, as well as the barrier pillars between both South Deep and Ezulwini and Cooke 3 and Ezulwini, indicated that the probability of failure of the plugs and pillars is small enough to be considered negligible.

On the strength of the findings of these investigations, an application under NEMA and the NWA was submitted to the regulators for authorisation to re-water the mine workings and aquifer. This involved specialist impact studies, risk assessments and two rounds of public participation, with input from

neighbouring mines, communities, regulators and NGOs being received. A decision is expected during 2018, in line with the legislated Basic Assessment Process.

### 2017 closure liability and rehabilitation

The key focus of the 2017 closure liability assessment for the SA region was to align closure costs for the PGM operations, acquired during 2016, with those of Sibanye-Stillwater's various gold operations. The 2017 closure liability provided for a closure framework that includes the compilation of concurrent rehabilitation plans and risk assessments for all operations as per the requirements of GN1147. These plans will be strictly managed and delivered to reduce the overall closure liability over time.

The total liability for the SA region is R6.9 billion as at 31 December 2017 (2016: R6.2 billion) as follows:

- PGM operations – R2.7 billion (2016: R2.1 billion)
- Gold operations – R4.2 billion (2016: R4.1 billion)

The 2017 assessment is the culmination of a five-year project to refine the model for the gold operations to an acceptable level of accuracy and detail to be used in concurrent rehabilitation planning at the different operations. This resulted in a net increase (1.6%) in the annual liability costs, comprising market related increases in demolition rates, but also decreases in closure liabilities as a result of the reworking of Surface Rock Dumps and the demolition of redundant infrastructure.

A different approach and assessment methodology had been used previously to assess closure liabilities at the PGM operations. Alignment with the Sibanye-Stillwater model resulted in a 33.6% increase in the 2017 liability costs for these operations. The main contributors to the increase are amongst others, the use of to-date demolition unit rates used in the assessment, the inclusion of detailed actions required, as well as the application and costing of rehabilitation strategies as defined and developed over the past five years at the gold operations.

### VAT on closure provisions

Towards the end of 2016 Pre-Directives (Notices of Intention to issue a Compliance Notice) were issued by the DMR: Gauteng region to three of our SA gold operations, directing those them to include and provide for a then-14% Value Added Tax (VAT) in their closure liability calculations. In January 2017, and as directed by the pre-directive, Sibanye-Stillwater, supported by strong legal arguments, submitted comprehensive responses/representations to the DMR on this contentious issue, including a tax advisory from PwC Tax Advisory Services and an official VAT Ruling from the South African Revenue Service (SARS) applied for in December 2016. Both these documents concurred and confirmed that:

- Contributions by Sibanye-Stillwater to the environmental trust funds are not subject to VAT

- Reimbursement of rehabilitation expenditure incurred is not subject to tax provided it relates to a taxable supply made by Sibanye-Stillwater
- Sibanye-Stillwater is entitled to deduct input tax, in respect of the VAT on rehabilitation expenses incurred by it in the course of conducting its mining operations and paid by the Trust or Guardrisk on behalf of Sibanye-Stillwater.

Despite representation, formal letters and submissions, the DMR has not formally responded and so the VAT issue remains unresolved. The issue has further complications for Sibanye-Stillwater in that the DMR has been withholding key environmental authorisations in lieu of payment of VAT, including authorisations for the WRTRP.

The total area under management by Sibanye-Stillwater at the gold operations in 2017 was 50,316ha of which the total of land disturbed by mining and related activities was 17,359ha. At the SA PGM operations, a total area of 24,368ha are managed and disturbed by mining and related activities.

### LAND RECLAMATION IN THE US REGION

Since their inception, mines in the US region have embraced interim reclamation of mine disturbances. Waste rock and tailings are non-acid generating and meet all applicable regulatory standards, such that soils and vegetation are unlikely to be affected at final reclamation and closure. This non-acidic waste, in conjunction with interim reclamation practices, substantially minimises potential impacts to air and water resources while re-establishing forage and biological diversity that benefit wildlife and maintain the visual integrity of the sites. For example, at the Stillwater mine's Hertzler tailings site, we have collaborated with regulatory authorities to improve the tailings embankment design, which allows for concurrent reclamation with significant visual appearance and revegetation benefits. When final closure occurs, the design will reduce final reclamation costs, help re-establish productive wildlife habitat, and maintain the visual integrity of the site and functionality.

Reclamation and closure bonds are required at both US region mines to ensure adequate resources exist to fund reclamation activities at closure. These amounts are adjusted every five years following a collaborative review by the Company and its regulatory agencies. In 2017, the reclamation and closure bond amount for the Stillwater mine was US\$24.30 million, including that of the Benbow portal, while the bond amount for the East Boulder mine was US\$18.00 million.

In addition to responsible closure and reclamation, the Company employs conservation easements on nearly 40% of its owned land. These legal mechanisms protect scenic vistas, enhance wildlife habitat, preserve wildlife migration corridors, all while maintaining Montana's rural character and fostering biodiversity and healthy forests.

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

### Land under management and rehabilitated in the US region – as at 31 December 2017 (Hectares)

	Total and/or permitted	Disturbed	Undisturbed	Rehabilitated / reclaimed
East Boulder	132.7	86.0	46.7	20.4
Stillwater	424.9	356.3	68.6	207.1
Metallurgical Complex	82.6	13.0	69.6	0
<b>Total</b>	<b>640.2</b>	<b>455.3</b>	<b>184.9</b>	<b>227.5</b>

## WATER MANAGEMENT

### WATER MANAGEMENT SYSTEMS AND FOOTPRINT

Sibanye-Stillwater recognises water as a critical resource, and considers an integrated approach to the management of its water footprint and its water systems infrastructure as a key component of its business strategy. Efficient water management is vital in terms of preservation, consumption and cost.

Our Southern African water footprint in terms of water withdrawn, consumed and purchased is detailed below. The Group water footprint in the SA region increased significantly following the acquisitions of the PGM operations. Water intensity, a measure of the amount of water used per tonne treated, improved largely as a result of the efficient use of water by the PGM operations – to 1.31kl/tonne in 2017 compared with 1.71kl/tonne in 2016. Less water is used at the PGM operations than at the gold operations as a result of the dry nature of the mines, the substantial number of domestic consumers on the gold mines and the Beatrix evaporation pans, which evaporate excess fissure water. The water intensity for the gold operations increased year on year as a result of the decrease in tonnes processed.

### Sibanye-Stillwater's water footprint – our water usage

	2017				2016		
	Group	US region*	SA region		Group	SA region	
			PGM	Gold		PGM**	Gold
Water withdrawal (ML)	125,135	2,447	13,831	108,857	111,693	4,376	107,317
Water discharged (ML)	70,586	1714	0	68,872	65,833	0	65,833
Water used** (ML)	54,548	733	13,831	39,984	45,860	4,376	41,484
Total water purchased (ML)	20,933	94	8,937	11,902	15,027	2,674	12,353
Water purchased from water services authorities (%)	38	13	65	30	33	61	30
Volumes treated (Mt)	41.83	1.9	20.90	19.03	26.80	6.60	20.20
Intensity (kl/tonne treated)	1.31	0.43	0.66	2.10	1.71	0.66	2.05

\* For the period May to December 2017

\*\* The figures for 2016 includes Kroondal from April 2016 and Rustenburg operations from November 2016

"Total purchased" includes "Potable water purchased" and "Municipal sewage effluent purchased" at Rustenburg operations

"Water withdrawal" Includes all water abstracted from ground water sources and total purchased

"Water discharged" is all water discharged into the environment at licenced discharge points

"Water used" is water withdrawal – water discharged

"Volumes treated" is all dry tonnes processed in Sibanye-Stillwater metallurgical plants and concentrators

"Intensity" is water used/volumes treated

Note: Water used = total abstracted (withdrawn) minus water discharged

In the SA region, the water management control system has been extended to include continuous water quality data and flow metering for process control. By year-end, an automated water metering system had been successfully deployed across the West Rand and at Beatrix in the Free State province. Approximately 220 potable water meters are now being used to monitor water consumption continuously and to identify the location of water leaks. Leaks detected at Driefontein and Cooke have resulted in monthly savings of more than R2 million. The intention is to fully integrate the system across all operations to minimise water losses across the Southern African footprint. This system is to be rolled out at the SA PGM operations by the third quarter of 2018. Through the implementation of the water metering system, it has also been established that there is substantial scope to reduce water consumption at specific consumption points.

The strategy to monitor and manage the Sibanye-Stillwater water footprint is aligned with our strategy to be independent of municipal water and improve our water security and reduce our dependence on external suppliers of potable water. There are two primary advantages to being water independent:

- It will allow the operations to generate potable water from already available underground fissure sources more cheaply than it costs to purchase drinking water from municipal supplies
- It will reduce the load on municipal supplies significantly and allow them to make provision for the shortfalls predicted in the future

During 2017, a business case for potable water independence was developed, concept designs were done, proposals were invited, and purchase equities prepared. The project entails the interim upgrade by adding a 5ML/d membrane softening facility. Completion is expected in 2018.

## WATER COST SAVING INITIATIVES

### Potable water conservation and water demand management

While Sibanye-Stillwater advances the critical water independence strategy, water cost saving initiatives initiated during 2017 will continue. The table that follows compares 2017 potable water consumption with that of previous years and indicates the savings achieved.

### Total potable water purchased 2015 - 2017

Potable water purchased (ML)	2017	2016	2015
Beatrix	<b>2,881</b>	2,758	3,201
Cooke	<b>2,123</b>	2,692	4,112
Driefontein	<b>2,210</b>	1,657	1,726
Kloof	<b>4,688</b>	5,247	5,755
Kroondal	<b>1,744</b>	2,333*	
Rustenburg	<b>4,637</b>	4,977*	
Total – Gold operations	<b>11,902</b>	12,353	14,794
Total – PGM operations	<b>6,382</b>	7,309	
Total – SA region	<b>18,284</b>	19,663	14,794

\* The figures for 2016 include the Kroondal and Rustenburg operations from January 2016

Following the installation of bulk water meters to improve water conservation and water demand the drinking water purchased has reduced across the SA footprint. The gold operations saw a 451ML reduction despite substantial increases in the Driefontein and Beatrix operation. Driefontein and Beatrix consumption increased by 33% and 4.5% respectively following production demands. The substantial decrease observed at the Cooke operation (569 ML or 21.1% year on year) and Kloof operation (559 ML or 10.7% year on year) followed the implementation of effective leak management interventions and improved use of process (return water) and effective offset of purchased water to available fissure water.

The increased pumping capacity between the Marikana return water dam and the Kroondal return water dams, enabled the Kroondal operation to withdraw more water from the Marikana pits, resulting in a reduction of 588 ML (26%) for total water purchased<sup>1</sup>.

<sup>1</sup> To determine this impact, the consumption for 12 months in 2016 was compared with 12 months in 2017 even though Sibanye-Stillwater only acquired Kroondal in April 2016.

### Potable water treatment cost minimisation

Sibanye-Stillwater continues to operate two potable water treatment facilities which softens hard underground fissure to SANS241 potable standards.

Driefontein consumed a total of 9,097 ML of Potable water of which 2,210ML was purchased from Merafong Municipality and the rest supplied from underground fissure water treated by sand filter and ion exchange treatment facility. This treatment facility enabled potable water to be obtained at a substantially lower cost and affected a cost saving of R40.1 million during 2017.

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

Another treatment facility, in this case a crystal actor treatment plant, is operated at Cooke 4. This operations consumed a total of 1,133 ML of which 126 ML was purchased from a Rand Water Board source. The crystal actor affected a cost saving of R 4.9 Million in operational cost during 2017.

### Review of municipal water charges, water resource management systems and costs

Sibanye-Stillwater receives water from Rand Water, Sedibeng Water, Rand West Local Municipality, Merafong Local Municipality and Rustenburg Local Municipality. A substantial component of water cost control and management is the review and reconciliation of invoices from municipalities and other water supply authorities for purchased water and water resource management charges. Invoice irregularities have been identified. A process has been instituted to reconcile invoices received with volumes purchased and to resolve issues, administrative delays and inefficiencies.

### Optimisation of the number of water monitoring control points

During 2017, more opportunities were identified to reduce the number of water quality monitoring points and in so doing, reduce the number of compliance samples. To realise such cost savings, a new integrated monitoring programme will be developed with support from the DWS. This initiative will continue into 2018.

### Update on water management operations

Sibanye-Stillwater's Environmental Department provides operational and contracts management support for several water management facilities, including: surface water potable water treatment plants, the Western Basin Acid Mine Drainage (AMD) treatment facility, a mud dewatering plant (MUM), underground settlers, cold lime softening plants, cooling water treatment plants, underground potable water plants, wastewater (sewage) treatment plants and new technology pilot plants. The 2017 highlights include:

- Successful re-commissioning of the MUM project to treat underground mud from Cooke 1 and 2 shafts. Some 800 tonnes of mud was dewatered and treated at the Ezulwini metallurgical plant during 2017.
- Successful commissioning of the 250m<sup>3</sup>/day WRTRP water treatment pilot plant. The pilot plant treats return water from a tailings facility to potable standards while simultaneously ensuring the waste stream is of stable composition for disposal on the tailings facility.
- Sibanye-Stillwater successfully converted some of their underground settlers at Cooke 1, Cooke 2 and Cooke 4 into cold lime softening units so as to enable the removal of metals and uranium from the settled water being discharged into the environment.
- AMD treatment facility: Alkaline tailings from the Cooke surface reclamation project has had the desirable effect of neutralising acidic water in the Western Basin, following deposition into the pits. This has reduced the acidity of the basin and improved the discharge quality of the water.

- Western Basin Treatment Facility: The treatment plant which treats AMD increased the treatment rate to 35-40ML/day during the first quarter of 2017. This increased treatment rate has lowered the water table in the Western Basin by 3.5m; the deepest level since the decant from the Western Basin started in 2002.

### Water management in the US region

Water is generally not a scarce resource in the US region, however management of excess mine water, its treatment and disposal, remain a primary focus. Related to this is management of water in tailings facilities. Water treatment facilities are employed at the mines and portal sites to remove nitrogen added to mine water and waste rock from blasting operations. The water treatment facilities employ a biological treatment process to remove enough nitrogen so that the treated water can be disposed of either through land application disposal, percolation, or deep well injection. These facilities, which are reviewed and optimised continually, are to be expanded in the near future.



## AIR QUALITY – ENERGY AND EMISSIONS MANAGEMENT

Sibanye-Stillwater monitors and measures its emissions from direct fuel sources such as diesel (scope 1), emissions from indirect fuel sources such as purchased electricity (scope 2) and indirect emissions associated with purchased materials.

### Energy consumption (TWh)

	2017	2016	2015	2014	2013
<b>SA region</b>	<b>5.77</b>	4.72	4.23	4.27	3.78
<b>Gold operations</b>	<b>* 4.16</b>	4.16	4.23	4.27	3.78
Beatrix	<b>0.63</b>	0.66	0.65	0.65	0.66
Cooke	<b>0.54</b>	0.58	0.59	0.63	–
Driefontein	<b>1.50</b>	1.44	1.47	1.47	1.56
Kloof	<b>1.47</b>	1.46	1.50	1.53	1.55
<b>PGM operations</b>	<b>1.61</b>	0.56			
Kroondal	<b>0.36</b>	0.35			
Rustenburg	<b>1.24</b>	0.21			
<b>US region**</b>	<b>0.24</b>				
Stillwater (includes the Columbus Metallurgical Complex)	<b>0.19</b>				
East Boulder	<b>0.53</b>				
<b>Group total</b>	<b>6.01</b>	4.72	4.23	4.27	3.78

\* Includes Burnstone's consumption of 0.03TWh

\*\* For the period May to December 2017

### Nitrogen and sulphur oxide emissions

The volumes of materials consumed have a direct bearing on our scope 1 and scope 3 carbon emissions and also on emissions of nitrogen oxides and sulphur oxides.

	2017	2016	2015	2014	2013
<b>Nitrogen oxides (tonnes)</b>					
SA region	<b>1,126</b>	887	618	19,901	14,618
US region*	<b>105</b>				
<b>Total</b>	<b>1,231</b>	887	618	19,901	14,618
<b>Sulphur oxides (tonnes)</b>					
SA region	<b>605</b>	667	499	632	464
US region*	<b>6</b>				
<b>Total</b>	<b>611</b>	667	499	632	464

\* For the period January to December 2017

Nitrogen oxide and sulphur oxide emissions for the Southern Africa region are derived by the multiplication of fuels (diesel, petrol, liquid petroleum gas, coal, helicopter fuel and paraffin) by the corresponding emission factors. Nitrogen oxides and sulphur oxides are monitored as key indicators of emissions from combustion of fuels



## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

The increase in nitrogen oxides from 2016 to 2017 is attributed to the increased volumes of diesel consumed in 2017 by the PGM operations which are accounted for the full year in 2017 as compared with 2016 when consumptions were pro rata from the dates of acquisitions – Kroondal from April 2016 and Rustenburg operation from November 2016.

The decrease in sulphur oxides from 2016 to 2017 is attributable to the reduced volume of coal used (reduced from 22 533 tonnes in 2016 to 15 017 tonnes in 2017). Coal is used at our Beatrix operation for comfort heating at the high density residences. One of the two boilers was out of order for a period during 2017, resulting in lower coal consumption. Currently there are no regulated limits for sulphur oxide emissions.

### Air emissions management in the US region

The US region continues to leverage technology to reduce air emissions and exceed state and federal standards. Air emissions at the Metallurgical Complex are generally well controlled. Sulphur dioxide (SO<sub>2</sub>) is the primary constituent affecting air quality at processing facilities in the region. At these facilities, gasses released from smelting operations are routed through a state-of-the-art, dual alkaline, gas/liquid scrubbing system, which removes approximately 99.8% of SO<sub>2</sub>. In 2017, only 2.6t of SO<sub>2</sub> was released during the 12 months, which amounts to only 3.5% of the permitted limit.

In addition to very low SO<sub>2</sub> emissions, our Base Metals Refinery (BMR) recently moved away from using SO<sub>2</sub> as a reagent to remove impurities from the electro-winning feed stream. Rather than purchasing liquid SO<sub>2</sub>, shipping it to the facility, and storing it on-site, Company metallurgists were able to employ copper fines, a recycled copper e-scrap product as a replacement. Ceasing the use of liquid SO<sub>2</sub> on-site removes the need for heightened regulatory oversight.

### Energy and carbon management

The South African government is looking to implement measures such as carbon budgets and carbon tax to encourage the reduction of carbon emissions. The National Treasury released the second draft carbon tax bill in December 2017 for comment. The full implications of this draft bill are being assessed and comments were submitted on 9 March 2018. The financial implications of the first draft carbon tax bill had been estimated to be between approximately R4 million and R25 million annually on the premise that purchased electricity (scope 2) emissions are excluded. In the event that purchased electricity (scope 2) emissions are included, the annual tax liability could increase to between approximately R249 million and R271 million.

Sibanye-Stillwater is opposed to the introduction of a carbon tax on the basis that the incremental cost negatively affects the economic viability of marginal operations, which in turn impacts employment.

Sibanye-Stillwater continually seeks to actively reduce its carbon emissions by, among others, the implementation of energy efficiency projects. Such projects also provide added benefits including the tax incentive opportunity presented by Section 12L

of the Income Tax Act, which makes provision for businesses to claim a deduction against taxable income on energy efficiency savings of R0.95 per kWh saved.

During 2017, six projects from the gold operations were registered with the South African National Energy Development Institute. These projects have realised tax certificates totalling R180 million. These tax certificates make it possible for the respective deductions to be made from taxable income. In addition, PwC has been tasked with exploring opportunities on a broader facility-based approach for Section 12L eligibility. If successful, the facility-based applications could realise tax certificates amounting to approximately R149 million. The SA region's PGM operations are also exploring potential opportunities from the Section 12L incentive.

### Energy management in the US region

To increase operational efficiency and reduce energy consumption, steps have been taken to implement more efficient management of the ventilation systems and the supply and management of compressed air at the East Boulder and Stillwater mines. In addition, energy efficient lighting systems have been installed across the operations.

In the area of electricity consumption, the US region began purchasing a portion of its electricity as renewable hydropower from Energy Keepers, Inc. (EKI), a Native American tribal entity, which operates a three-unit hydroelectric facility on the Flathead River in north-west Montana. EKI is the first tribally-owned major hydroelectric operator in the US.

In addition to this hydroelectric source, a new solar panel array at the Metallurgical Complex was commissioned in December 2017. This array has a peak output of 100kW and will provide electricity to power the main office building at the Complex. It is estimated the array will produce about 144,000kWh annually, which is enough electricity to power 13 homes.

### Energy reduction initiatives

The gold operations spent R39.3 million on energy efficiency initiatives during 2017. This resulted in energy savings of 9.7MW.

Some of the key initiatives implemented at the gold operations were aimed at optimising the main ventilation fans by installing medium-voltage variable-speed drives on drive motors, improved turbine availability and efficiency, optimising cooling cars, the installation of localised air conditioning units underground, and regarding pumping, various efficiency projects are underway, including the installation of heat pumps and closed-loop cooling systems.

The SA region's PGM operations continued with the compressed air optimisation project in 2017. Two performance assessments of twelve to cover the three year project period, were completed with very positive results. So far, the project has saved more than 3 700 MWh. This equates to a R3-million saving for the 2017 financial year. The compressed air project, an integrated demand management project, was partially funded by Eskom in support of energy efficiency initiatives.

## Energy intensity (GJ/tonne milled)

	2017	2016	2015	2014	2013
<b>SA region</b>	<b>0.60</b>	0.68	1.02	0.98	1.05
<b>Gold operations</b>	<b>0.79</b>	0.79	1.02	0.98	1.05
Beatrix	<b>0.78</b>	0.69	0.73	0.69	0.70
Cooke	<b>0.53</b>	0.43	0.76	0.77	–
Driefontein	<b>0.91</b>	0.89	1.03	1.09	1.08
Kloof	<b>0.94</b>	1.15	1.56	1.36	1.36
<b>PGM operations</b>	<b>0.22</b>	0.45			
Kroondal	<b>0.21</b>	0.51			
Rustenburg	<b>0.22</b>	0.38			
<b>US region*</b>	<b>0.95</b>				
Stillwater (includes the Metallurgical Complex)	<b>1.40</b>				
East Boulder	<b>0.49</b>				
<b>Group total</b>	<b>0.69</b>	0.68	1.02	0.98	1.05

\* For the period May to December 2017



## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED



### SOLAR ENERGY

A prefeasibility study completed in 2014 confirmed a solar photovoltaic plant could supply carbon-neutral electricity as an economic, competitive alternative to carbon-intensive grid-supplied power. 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-Stillwater's mining operations represents a partial solution to securing alternative electricity supply and allows the power generated to be injected directly into the mine's electrical reticulation.

Given regulatory delays, highlighted as the largest risk to the project in the 2016 IAR, the planned operation of the first phase of 50MW has been moved out to the second half of 2019. Despite these delays, significant progress was made in 2017 towards project execution. Two Environmental Authorisations in terms of the National Environmental Act were provisionally granted by the Department of Environmental Affairs, together with a Water Use Authorisation in terms of the National Water Act from the Department of Water and Sanitation. Rezoning of the land was also approved by the Rand West City Local Municipality. Combined, these approvals allow for construction of the plant and associated infrastructure on the project site. The geotechnical studies and basic engineering design have been completed in support of the project.

To execute the project, Sibanye-Stillwater 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-Stillwater through a power purchase agreement (PPA). This approach has a minimal upfront capital requirement for

Sibanye-Stillwater and allows capital to be prioritised for core mining projects. The tender was successfully concluded in 2017, enabling a significant forecasted return to Sibanye-Stillwater over the course of the agreement.

Eskom, as the local grid operator, has provided provisional technical approval of the plant's interconnection, as required by the Electricity Regulation Act. The commercial terms of their statutory connection and operations monitoring function are still being negotiated. With approval from the Department of Energy, Sibanye-Stillwater and the preferred project developer are in the process of applying for a generation licence from the National Energy Regulator which is required to operate the plant.

In 2018, the final milestones will be obtained, allowing the construction phase to begin in the second half of the year. The terms of the power purchase agreement are currently being concluded with the preferred project developer. The agreement is expected to be executed in H1 2018, subject to final Board approval. Financial close will be reached once the final regulatory approvals are granted, allowing construction to begin. Although the project team carefully monitors and manages these, energy sector uncertainty and regulatory approvals remain the biggest implementation risk to the project.

This technology and approach to utility-scale private power supply are being adopted at a rapid pace globally, with Sibanye-Stillwater leading the charge in Africa. Once completed, this project will be the single largest private offtake plant on the African continent. 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 120,000t CO<sub>2</sub>e per 50MW phase.

## CARBON EMISSIONS

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

	2017				2016		2015	2014	2013	
	US		SA region		Group	SA region		SA region	SA region	
	Group	region*	PGM	Gold		PGM	Gold	Gold	Gold	
Scope 1 (excluding fugitive mine methane)	196	32	43	121	116	18	99	94	110	62
Scope 1 (fugitive mine methane)	565	na	na	565	596		596	650	660	572
Scope 2	5,837	183	1,573	4,081	4,720	557	4,163	4,272	4,405	3,774
Scope 3	2,539	544	980	1,016	1,029	180	849	867	863	634
CO <sub>2</sub> e intensity (per tonne milled)	0.13	0.01	0.06	0.25	0.22	0.12	0.24	0.25	0.28	0.32

\* For the period January to December 2017 in accordance with the World Resources Institute, greenhouse gas protocol

Not all entities include all categories of scope 3 emissions as the newly acquired entities such as Rustenburg PGM and Stillwater are still obtaining information on certain categories to be reported in the future

Emissions from at least eight of the 15 Scope 3 categories have been included as follows:

- <sup>1</sup> Purchased goods and services: emissions associated with the extraction and production
- <sup>2</sup> Capital goods: emissions associated with the production of purchased company-owned vehicles
- <sup>3</sup> Fuel- and energy-related emissions not included in Scope 1 or Scope 2: emissions associated with the extraction, production and transportation of diesel, petrol, liquid petroleum, gas, coal, blasting agents, oxyacetylene and grid electricity
- <sup>4</sup> Upstream transportation and distribution: emissions associated with the transportation and distribution of purchased commodities
- <sup>5</sup> Waste generated in operations: emissions associated with the disposal and treatment of Sibanye-Stillwater's solid waste and waste water in facilities owned or operated by third parties (such as municipal landfills and wastewater treatment facilities)
- <sup>6</sup> Employee commuting: emissions associated with the transportation of Sibanye-Stillwater's employees between their homes and work sites
- <sup>7</sup> Downstream transportation and distribution: CO<sub>2</sub>e emissions associated with transportation of product from Sibanye-Stillwater
- <sup>8</sup> Processing of sold products: CO<sub>2</sub>e emissions associated with smelting and refining
- <sup>9</sup> End-of-life treatment of sold products: CO<sub>2</sub>e emissions associated with smelting to repurpose the product
- <sup>10</sup> Downstream leased assets are applicable to the SA region only: CO<sub>2</sub>e emissions associated with the leasing of houses to mineworkers where emissions are generated from electricity use
- <sup>11</sup> Investments: are applicable to the Southern Africa region only
- <sup>12</sup> Business travel in the US region was not tracked and therefore not included

The following Scope 3 categories have not been included:

- Franchises: Sibanye-Stillwater does not have any franchises
- Use of sold products: emissions associated with the use of products sold are deemed insignificant as only processing and end-of-life treatment of products sold are expected to have significant associated emissions
- Upstream leased assets: no significant upstream leased assets have been identified

Purchased electricity formed the bulk of Sibanye-Stillwater's carbon emissions, accounting for 91%. The continuation of energy efficiency projects and the implementation of the planned solar PV project is expected to further reduce emissions from purchased electricity.

The South African National Treasury aims to encourage companies to gradually revise their fuel inputs, production techniques and processes by encouraging investments into energy efficient and low carbon technologies. The lower emissions will be incentivised further on the introduction of a carbon tax. The first phase of implementation has been extended from 2020 to 2022. The carbon tax will be introduced at a rate R120 per tonne of CO<sub>2</sub> equivalent and increased annually by the consumer price inflation plus 2%. The 60% tax-free threshold and allowances for trade exposure, performance and offsets have been retained from the first draft with revised specifications. The full implications are being assessed and detailed comments will be submitted to National Treasury during the commenting period.

Given the recent incorporation of the US region, base year emissions are currently under review. This will form the basis for our new company-wide targets.

## MINIMISING THE ENVIRONMENTAL IMPACT CONTINUED

### MATERIALS CONSUMED

A range of materials is consumed in the conduct of our business, the use of which we optimise so as to reduce both costs and consumption.

#### Materials consumed

Tonnes	2017				2016		2015	2014	2013	
	Group*	US			Group	SA region		SA region	SA region	
		region <sup>1</sup>	SA region			SA region	SA region	SA region		
			PGM	PGM			Gold	PGM <sup>2</sup>	Gold	
Timber	102,543	263	878	101,402	110,606	82	110,524	163,722	104,468	110,524
Cyanide	7,552	na	na	7,552	11,967	na	11,967	11,924	11,758	11,967
Explosives	31,942	3,893	22,140	5,902	13,814	7,046	6,768	7,854	4,175	6,768
Hydrochloric acid	4,469	0.4	na	4,469	4,414	na	4,414	3,773	3,579	4,414
Caustic soda	3,378	204	na	3,174	2,674	na	2,674	3,421	2,947	2,674
Lime	72,378	na	na	72,378	76,556	na	76,556	68,128	39,843	76,556
Cement <sup>3</sup>	60,706	16,459	4,345	40,788	44,378	1,513	42,865	41,101	38,579	42,865
Diesel (kL)	26,065	7,344	4,897	5,943	10,422	3,325	7,097	6,410	6,274	7,097
Lubricating and hydraulic oil (kL)	7,639	565	4,280	1,411	7,777	7,777				
Grease (kg)	212,102	11	4,261	186,953	19	19				

<sup>1</sup> For the period January to December 2017, of which May to December 2017 were consumed by Sibanye-Stillwater

<sup>2</sup> PGM data for 2016 include operations under management – Kroondal (50%) is included for the nine months from April to December 2016 and Rustenburg operation for two months (November and December 2016)

<sup>3</sup> Includes all categories of cement and cement mixtures

<sup>4</sup> Represents five months for the Rustenburg operations and 12 months for Kroondal

\* Group total includes four months (January to April 2017) of Stillwater materials consumed before these operations were under our ownership

### GOVERNANCE

Sound governance on environmental issues remains the backbone of our efforts to achieve our Environmental Vision 2020, and to achieve and remain legally compliant. At Sibanye-Stillwater, our environmental policies (such as our Water Management Policy, Carbon Management Policy, among others), our environmental vision and operating procedures govern our environmental activities, performance and reporting. In the Southern Africa region, internal environmental monitoring, site inspections, and audits are conducted at pre-determined frequencies in order to assess legal compliance at operational level, as well as to gauge the implementation and achievement of environmental targets, objectives and programmes. In addition, external audits are conducted by third parties related to our:

- Water use licences (WULs)
- Environmental Management Plans (EMPs)
- Any other environmental permit, licence or approval, where external and third-party auditing is a condition of approval

External auditors also review and monitor data and the Department of Water & Sanitation (DWS) and DMR conduct regulatory inspections, as does the National Nuclear Regulator (NNR) and the Trans-Caledon Tunnel Authority.

Internal environmental reporting is as follows:

- Monthly operational environmental performance reports to all operational vice presidents and senior operational staff
- Monthly NEHS (natural environment, health and safety) meeting (executive committee) at which non-conformances and principal indicators, as assured by external auditors, are discussed
- Quarterly report into the social and ethics, audit and risk committees, where material environmental issues are reported, and where oversight on these is sought from these board committees
- Ad hoc performance and issues-based reports to relevant staff to highlight specific environmental issues and mitigation measures

Other initiatives implemented to strengthen environmental governance at our operations include the following:

- The compilation and maintenance of an Environmental Risk Register, as part of the enterprise-wide risk management (ERM) system, highlighting material environmental risks, their potential impact on the business and how they can be mitigated
- The re-introduction of an environmental management system aligned to the principles of ISO 14001
- Effective environmental stakeholder engagement as part of environmental governance

Externally, the US region's operations are governed by a multitude of permits issued by the Montana Department of Environmental Quality, the United States Forest Service, and the Environmental Protection Agency. Routine (generally annual) reporting to the agencies is done for operating and other primary permits, as are regular agency inspections.

In addition to these regulatory relationships, we engage frequently with the Good Neighbour stakeholders to address planned operational activities, as well as to report any environmental incidents. The Good Neighbours undertake audits of certain components of the applicable agreement at various times.

## FUTURE FOCUS

In the SA region:

- Responsible compliance with all legal, regulatory and generally accepted standards applicable to our mining operations in different jurisdictions
  - Ensuring that water abstracted, used, stored and / or discharged is compliant with legal and regulatory requirements
- Proactive environmental incident management supported by enabling technologies and comprehensive reporting, in order to minimise or prevent pollution
- Implementation of sound environmental management practices and systems, and the development of fit-for-purpose environmental standards and procedures that promote continual improvement
- Proactive air quality management using nationally prescribed methodologies
- Efficient and responsible use of natural resources including water and energy, and the responsible management of all waste and effluent streams emanating from our mining operations
- Implementation of a sustainable closure strategy, and concurrent rehabilitation for the environmentally responsible and effective socio-economic closure of our mining operations
- Continual assessment of our water, land and carbon footprint – developing resource conservation programmes to effectively manage and reduce our footprint
- Developing environmental training and awareness programmes for employees and communities
- Communicating openly and transparently with all our stakeholders insofar as our environmental impacts and environmental management programmes are concerned.
- Providing water that is safe and secure (available) for our people, machinery, infrastructure and the environment
- Hands-on supervision of water management contracts, thereby ensuring the efficient operation of water infrastructure
- Crafting and implementation of a municipal water independence strategy

In the US region from an environmental perspective, the focus in 2018 will be on:

- Continued mining, waste, and water management strategies that meet or exceed regulatory requirements, including the GNA
- Developing a long-term environmental strategy, including that related to water, tailings, waste, and air, and traffic management to support the long-term operations plans
- Achieving zero annual externally reportable and reduced internally reportable environmental incidents
- Enabling the sustained production of the operation plan's business goals
- Enabling the retention of the No.1 position in the PGM recycling industry with a planned sustained throughput
- Maintaining healthy relationships with the GNA and other external stakeholders
- Ensuring that the Environmental Team is fully resourced and strategically aligned to meet the US region's strategic goals