



**RioTinto**

Rössing Uranium  
Working for Namibia

Consolidating for success  
Report to stakeholders 2017



In the mine's open pit.

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## The purpose of this report

This report aims to give readers an overview of the activities of Rössing Uranium Limited (Rössing Uranium) from January to December 2017, including our interaction with society, the economy and the environment.

Although the Rio Tinto Group is the majority shareholder of Rössing Uranium, it is not the only stakeholder that invested in the business. All individuals and institutions that influence and are affected by the company are stakeholders, including the mine's employees and contractors; the communities of Arandis, Swakopmund and Walvis Bay; Government of Namibia institutions; service providers; and the mine's customers.

The report offers locally relevant information about our business and aspects raised during the year. We believe in open communication and transparency and simultaneously instil a culture of sustainable development throughout our company.

We would appreciate your feedback on the content in this report. You can send us a text message to +264 81 143 3627; send an e-mail to [RUL.communications@riotinto.com](mailto:RUL.communications@riotinto.com); contact us via our website at [www.rossing.com](http://www.rossing.com), or phone the Corporate communications section on Tel. +264 64 520 9111.

Front page: Portable scanners are used to quickly locate a broken-off tip, lip or wing shroud of a ground engagement tool (GET) (shovel bucket) and to remove it so that it does not end up in the crushing circuit where it could cause damage to equipment, resulting in costly down-time. Jason Niitembu, foreman shovel maintenance, demonstrates the use of the scanner to locate broken-off pieces.

# Overview

## Rössing Uranium

Uranium was discovered in the Namib Desert in 1928, but it was not until intensive exploration in the late 1950s that much interest was shown in the area. After discovering numerous uranium occurrences, Rio Tinto secured the rights to the low-grade Rössing deposit in 1966. Ten years later, in 1976, Rössing Uranium, Namibia's first commercial uranium mine, started with production.

Today, Namibia has three significant uranium mines, which together provide 6.8 per cent of the world's uranium oxide output; in 2017 Rössing Uranium produced 3 per cent of the world's output.

The mine has a nameplate capacity of 4,500 tonnes of uranium oxide per year and, by the end of 2017, had supplied a total of 132,610 tonnes of uranium oxide to the world.

The mine is located 12 km from the town of Arandis, which lies 70 km inland from the coastal town of Swakopmund in Namibia's Erongo Region. Walvis Bay, Namibia's only deep-water harbour, is located 30 km south of Swakopmund. The mine site encompasses a mining licence and accessory works areas of about 180 km<sup>2</sup>, of which 25 km<sup>2</sup> is used for mining, waste disposal and processing.

Mining is done by blasting, loading and hauling from the open pit before the uranium-bearing rock is processed to produce uranium oxide. The open pit currently measures 3 km by 1.5 km, and is 390 m deep.

Our partners and stakeholders include private citizens and their communities as well as non-governmental organisations, small-scale enterprises and multinational corporations. Thus, the benefits of our operations are felt locally, nationally, across the African continent and internationally.

### Shareholding

Rio Tinto owns the majority of shares (69 per cent) in Rössing Uranium Limited.

The Namibian Government has a shareholding of 3 per cent and it has the majority (51 per cent) when it comes to voting rights. The Iranian Foreign Investment Company (IFIC) is a passive legacy investor in Rössing Uranium, holding a 15 per cent stake that goes back to the early 1970s in the financing of the mine. The Industrial Development Corporation of South Africa owns 10 per cent, while individual shareholders own a combined 3 per cent shareholding.



Map of the Erongo Region indicating the location of the Rössing Uranium mine.



## Managing director's message



### Dear stakeholders

Welcome to Rössing Uranium's Report to stakeholders 2017. Thank you for your interest in our business. This report explains our mining operations and the approach we take in what we do. It also outlines how we performed in 2017 as measured against our key drivers.

The year 2017 was certainly a year of consolidation. Not only did we begin to see the results of the significant amount of work that we've put in over the past three years in our safety and mining operations, we also continued to invest in our most important asset — our people — for the sustainability of our business.

### **Celebrating milestones**

Although market conditions for uranium did not improve during 2017 and instead remained stagnant, in addition to the previous five years' deterioration, we have much to celebrate on a local level.

One such celebration — and an important milestone for us — was without a doubt, ending the year with an All-injury Frequency Rate (AIFR) of 0.39, the lowest in Rössing's past ten years. We believe this achievement is the result of our relentless quest towards zero harm, as expressed in our game-changer initiative, called critical risk management, or CRM, which is a programme designed to recognise critical risks in our work and eliminate fatalities.

The safety of our people is always our first priority and creating an environment which is fatality free, in which everyone goes home safely after every shift, remains a core value of our business. Although we are extremely proud of our low AIFR, we are aware that the challenge will be to improve on it, proving that Rössing is indeed a safety leader in the global uranium mining industry.

Another milestone — and one we're equally proud of — relates to two 'first-ers', both applicable to women in mining and attesting to our aim of working towards a more gender-inclusive work environment.

For the first time, the board of directors is chaired by a woman: Ms Foibe Louise Namene, who was appointed as from 1 December 2017. A warm word of welcome to her; we are looking forward to her professional guidance and support.

Also for the first time, Rössing Uranium's general manager: operations is a woman. In February 2018 Liezl Davies took over from Martin Tjipita who left Rössing to take up a senior executive role of leading the Namibian operations of an international company involved in the resources sector.

Currently, women form 18 per cent of our workforce and while it is in line with international mining trends, we actively want to increase this percentage. We encourage young female Namibians to explore the mining industry as a career option where opportunities abound.

### **Market conditions**

Throughout 2017, the uranium market remained stagnant, experiencing a significant oversupply of uranium. This resulted in the spot price languishing between US\$20 and US\$25 per pound for most of the year.

While the majority of Rössing's production is marketed through long-term contracts with a diverse selection of customers, the low spot price conditions impacted on market conditions and the overall portfolio price. It therefore remains challenging times for Rössing and other uranium producers worldwide.

### **Making our business sustainable**

We cannot control international market conditions, but we can support our human assets and operational environment. This we did to the best of our abilities during 2017.

An important step in making our business sustainable was to ensure we have the right people in the right places. A number of organisational changes took effect during the reporting year with the aim to improve specific areas of our business.



Although we are extremely proud of our low All-injury Frequency Rate of 0.39, we are aware that our challenge will be to improve on it, proving that Rössing Uranium is indeed a safety leader.”

We also successfully rolled out our WHY-project as one of our key 'people' initiatives. Working with our entire workforce, various sessions were held offsite with the goal being to engage our employees' minds, hearts and hands in order to go forward in creating an exciting future for Rössing.

Supporting the WHY-project was the *#onlytogether* initiative, which aimed at regularly reminding us that we must work together if we want to meet our production and cost-saving targets.

We put a significant amount of work into improving our operational output. Over the past few years we actively opened up high-grade ore areas and we are beginning to see the results of our investment: we steadily increased our production output over the past three years. Compared with 2014 to 2016 when we produced less than 2,000 tonnes uranium oxide, our 2017 production increased to 2,110 tonnes.

We have also done much work in contract management and other cost-saving initiatives. It is imperative that we need to consolidate these initiatives into a consistent production performance, making it a feature of our future business, and not just a once-off achievement.

Going forward, we will continue our consolidation and cost-saving efforts in 2018 and beyond, along with focusing on maximising our resources.

Our aspirations for 2018 are a fatality-free Rössing mine with an engaged and empowered workforce. Most importantly, we will continue to improve our safety foundation, especially around process safety, as it is a critical area for us. Consistent engagement of our employees remains key, as good engagement leads to good safety performance.

As in the past, our endeavour will be to work smarter and harder, always mindful of working safely, whilst staying committed to making a difference in Namibia.

### **Werner Duvenhage**

Managing director  
25 April 2018

## 2017 at a glance



An overview of part of the mine's Processing Plant in the foreground while part of the open pit can be seen in the background.

**2017 was a year  
of consolidation**

**N\$1.7 billion**

procurement expenditure was on Namibian-registered suppliers, accounting for 73.5 per cent of our total procurement expenditure of N\$2.3 billion

**N\$150 million**

in goods and services were purchased from local small- and medium enterprises (SMEs)

**N\$12.5 million  
community investment**

either directly through Rössing Uranium or the Rössing Foundation

**14%**

increase in tonnage of uranium oxide drummed: 2,110 tonnes compared with 1,850 tonnes in 2016

**50%**

decrease in our All-injury Frequency Rate\* against 2016

\* per 200,000 hours worked

**N\$8.5 million**

spent on employee development

**N\$6.4 million**

Rössing Uranium contributed to the Vocational Education and Training Levy

## Executive committee



**Werner Duvenhage**  
Managing director



**Leah Von Hagen**  
General manager, Organisational  
resources



**Shaan van Schalkwyk**  
Chief financial officer



**Liezl Davies**  
General manager, Operations  
(Former Manager Productivity;  
promoted 1 February 2018)



**Martin Tjipita**  
General manager, Operations  
(Took up a senior executive role of leading  
the Namibian operations of an international  
company involved in the resources sector at  
end February 2018)

# Our sustainable development approach

## Focusing on the issues that matter most

### **Sustainable development is the distinctive, significant and characteristic centre of our overall approach to business.**

Driving the integration of sustainable development at Rössing Uranium are the six themes highlighted below. These themes form the framework in which our business is conducted.

Everything we do is in line with the generally accepted definition of *sustainable development*, namely development that meets the needs of the present without compromising the ability of future generations to meet their needs.

This suggests that meeting the needs of future generations depends on how well we balance social, economic and environmental needs when making decisions today.

The aim of sustainable development is therefore to seek out win-win situations that can achieve environmental quality and increase economic wealth and social well-being, today and tomorrow.

Our sustainability vision remains focused on:

- creating long-lasting positive effects for the people of the Erongo Region and Namibia;
- building capacity to ensure that we contribute to the future well-being of our employees;
- minimising negative impacts and optimising positive ones; and
- maintaining our reputation as a responsible corporate citizen of Namibia.

When conducting our business we ensure that we maintain a balance in the way we:

- use our assets — both our own resources and environmental resources — to reflect our integrated approach in terms of profit, people and planet;
- contribute positively to the needs of society by providing support to communities without creating dependency; and
- generate economic wealth.

### **Economy**

#### **Economic viability**

In order to provide the best returns on our shareholders' investment, we need to understand the long-term demand for our product as well as the cost, resource availability and value creation associated with that demand. Economic viability also ensures that we continue to make significant contributions to Namibia's economy and her people in various ways.

### **Social**

#### **People**

Our workforce is central to our business. This means ensuring a safe and healthy workplace geared for human resource development in order to attract and retain employees, while maximising our contribution to their well-being.

#### **Communities**

By understanding the diversity of communities, and through continuous interaction with them, we can respond to their concerns and needs. Moreover, communities should realise a net benefit and a long-lasting, positive effect from our activities.

### **Environment and product stewardship**

#### **Environmental and asset resource stewardship**

We aim to be the leader in environmental stewardship in Namibia and to maintain our reputation as a responsible corporate citizen. This can be achieved by understanding and appreciating our natural resources, both biotic and abiotic, utilising them sustainably, and creating a net positive impact.

#### **Product stewardship**

This theme focuses on expanding our understanding of the impact of our product on society by working with all interested and affected parties.

### **Governance**

#### **Corporate governance and compliance**

We strive to be transparent and proactive in all our business operations. To this end we have auditable business systems in place which form the backbone of good corporate governance.

## Our key drivers

### Our strategic map

**Mission:** To be a uranium supplier to the global nuclear industry creating maximum return for our shareholders — whilst delivering benefits to all stakeholders.

**Vision:** To be the safest and most efficient, long-life uranium producer in the world.

Strategic focus areas	Objectives
Health, safety, environment and communities	Zero harm
People and culture	Talent management
	Living our values
Operational efficiency	Achieve integrated productivity model targets
Finance	Ensure cash flow
	Reduce unit costs
Partnerships	Transformational compliance

**Core values:** Safety — Teamwork — Respect — Integrity — Excellence



The highlight of Rössing's employee recognition programme, Making a difference (MAD), is celebrated every year. In 2017, 29 employees received awards, demonstrating that by working together, and through their commitment, they help raise the mine's performance to the next level.

## Marketing our product



Pontianus Kwandu at the mine's Final Product Recovery section is responsible for recording the newly-filled drums of uranium oxide.

## Marketing our product



Samples of our product, U<sub>3</sub>O<sub>8</sub> (uranium oxide), which is marketed mainly through long-term contracts to various customers worldwide.

All uranium produced by Rio Tinto's mines is marketed by Singapore-based Rio Tinto Uranium. As one of the longest-operating uranium mines in the world, Rössing Uranium supplies uranium oxide via Rio Tinto to nuclear power facilities located in all three major markets, namely Asia, North America and Europe/Middle East.

Almost all of Rössing Uranium's production is marketed through long-term contracts with a diverse selection of customers worldwide.

The uranium market remained in a state of significant oversupply throughout 2017 and the spot price languished between US\$20.00 and US\$25.00 per pound for most of the year. Utility customers are stocked with large inventories and thus have not been very active in the market, leaving most of the spot activity to traders.

The year began on a positive note with the spot price increasing from US\$21.00 to US\$26.50 in the first quarter, as traders reacted to news that the world's largest producer, Kazakhstan, was planning to cut output by 10 per cent in 2017.

Unfortunately, the effect was short-lived, as the spot price returned to the low US\$20s, and remained low until late in the year. The long-term price was stable in the low-US\$30s for most of the year, but there has been relatively little long-term contracting in the last few years as most utilities seek to work down inventories or concentrate on near-term purchasing to maintain flexibility.

Two major developments on the demand side cast a cloud over the industry for much of the year. The first was the surprise election of President Moon Jae-in in South Korea. Under previous administrations, the country had been a world leader in nuclear power, with 24 units in operation and another five under construction or planned for the future.

**Rio Tinto Uranium  
customers by region  
(%), 2017**



North America



Asia



Europe, Middle  
East and Africa



Japan

## Marketing our product

President Moon, however, quickly proposed closing some older units, halting construction of new reactors and developing a plan to completely exit nuclear power by 2025.

This proposal was made despite the absence of any reasonable technical or economic way to replace the large amount of CO<sub>2</sub>-free power generated by the Korean nuclear fleet. The proposal has received criticism from many quarters and it now appears the Government is beginning to recognise how disastrous this policy would be for the Korean environment and export-driven economy, which was largely built on reliable and cost-effective nuclear power. Nevertheless, this wholly unexpected incident was a blow to industry confidence worldwide and it will take time to see how the policy might be enacted.

The other major negative event was less of a surprise. After years of project delays and cost overruns on its AP-1000 nuclear plant design, United States (US) reactor vendor Westinghouse declared bankruptcy, jeopardising several AP-1000 projects under construction in the US and China. Within one month of that announcement, South

Carolina utility SCANA decided to terminate its two-unit VC Summer AP-1000 project, at a cost of \$9 billion, with the plants less than 50 per cent complete.

This was a major blow to what was left of the 'nuclear renaissance' in the United States and brought back bad memories of the post-Three Mile Island period in the 1980s, when a number of reactors under construction were abandoned due to cost overruns and public opposition. In this instance, as with Areva's failed attempts to construct its so-called Evolutionary Power Reactor (EPR) reactors in China and Europe, the problems were primarily related to design challenges and massive cost overruns.

Fortunately the remaining AP-1000 units under construction in China, while delayed, are still moving forward. And crucially, US utility Southern Company announced that it would continue with its two AP-1000 units under construction at the Vogtle plant in Georgia. So, by the early part of the next decade there should be two new reactors in operation in the US — a far cry from what was expected a decade ago, but still a positive development.

In the wake of all of this bad news, the uranium industry witnessed a positive development late in the year when the two largest producers, Kazatomprom and Cameco, separately announced major supply cutbacks in efforts to reduce the market oversupply and support the price.

Kazakhstan is now the largest-producing country by a wide margin, and the Government-owned uranium company Kazatomprom had executed a successful plan to expand its uranium production almost ten-fold over the past 15 years, using cost-effective in-situ leach technology. However, now realising that the post-Fukushima demand is not what it expected, the company has decided to reduce production by 20 per cent over the next three years.

Similarly, Canadian producer Cameco spent the last few years bringing its large, high-grade Cigar Lake project into production in northern Saskatchewan, during a period when market prices have fallen from the US\$60 level to below US\$20. Thus, the company announced that it would suspend operations at its neighbouring McArthur River operation for at least ten months in 2018, resulting in a withdrawal of some 15 million pounds from global production. Cameco will deliver into its contracts using material it has in inventory and possibly through market purchases.

These announcements from the two largest producers are an encouraging sign of more supply discipline by miners in a tough market, one that continues to face challenges on the demand side and from low-cost secondary supplies from a variety of sources, including enrichers. The spot price responded accordingly late in the year, rising back to the US\$25 level.



Rössing performed well in 2017, but the uranium market worsened in the face of several negative events over the course of the year. The first was a leadership change in South Korea that brought an anti-nuclear candidate into power, and the bankruptcy of reactor vendor Westinghouse a few months later was a significant blow to new reactor construction in the United States. As a result the spot price languished at low levels throughout the year.



But there are signs of improvement as some of our major competitors seek to rein in production to try to balance supply with demand.”

**Clark Beyer**  
Managing director, Rio Tinto Uranium

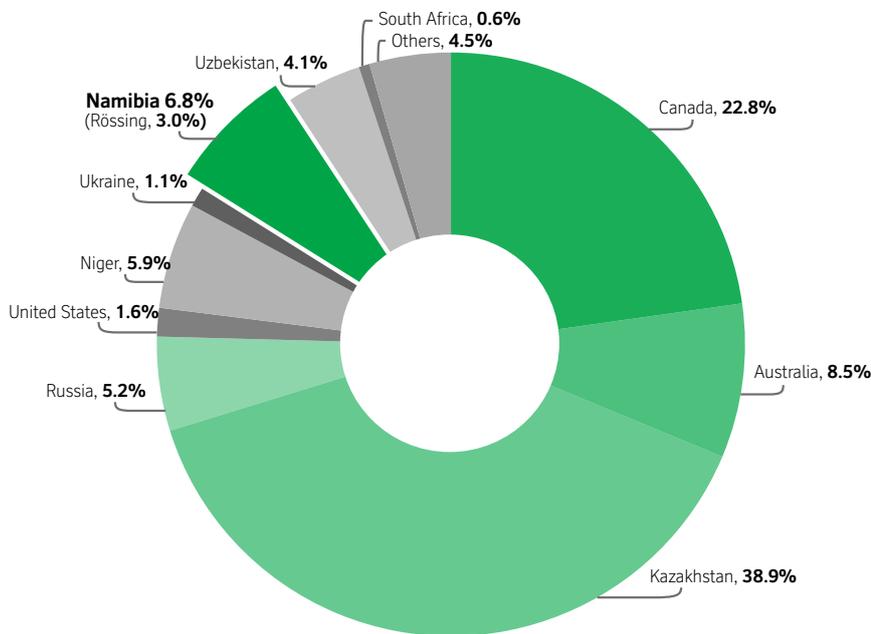
While upward price momentum seems to have stalled for now, these are positive signs that producers are starting to take more responsibility for the level of oversupply that exists in the market today.

In short, it remains a very challenging time for Rössing Uranium and other uranium producers regardless of cost position or geography. The current supply-demand imbalance is shrinking somewhat, but a significant price recovery in 2018 appears unlikely in the absence of a major supply disruption.

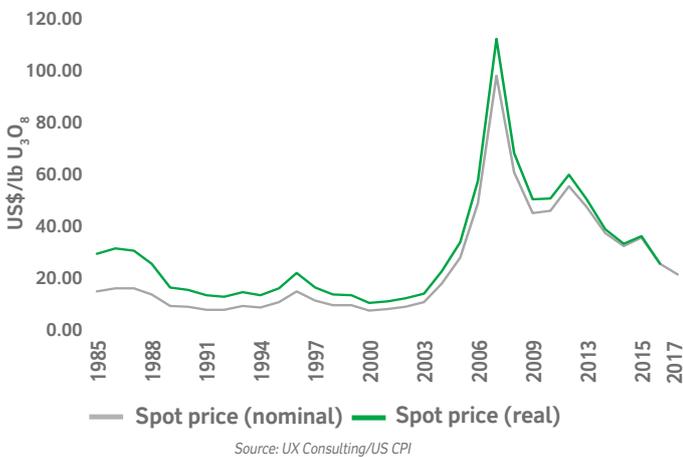
Importantly, Rössing Uranium's customers still value reliability and diversification, two attributes that Rio Tinto and Rössing Uranium bring to their supply portfolios.

In addition, hopefully the world will increasingly begin to appreciate the critical role that nuclear power plays in the world's energy security, reliability and carbon mitigation goals.

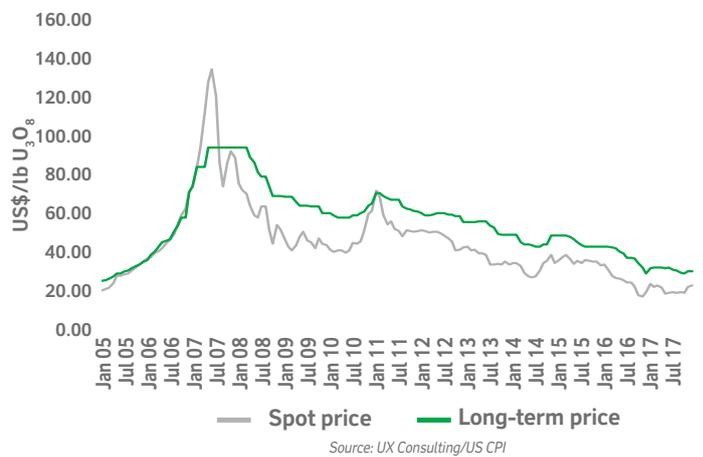
**Figure 1: World primary production of uranium oxide (%), 2017**



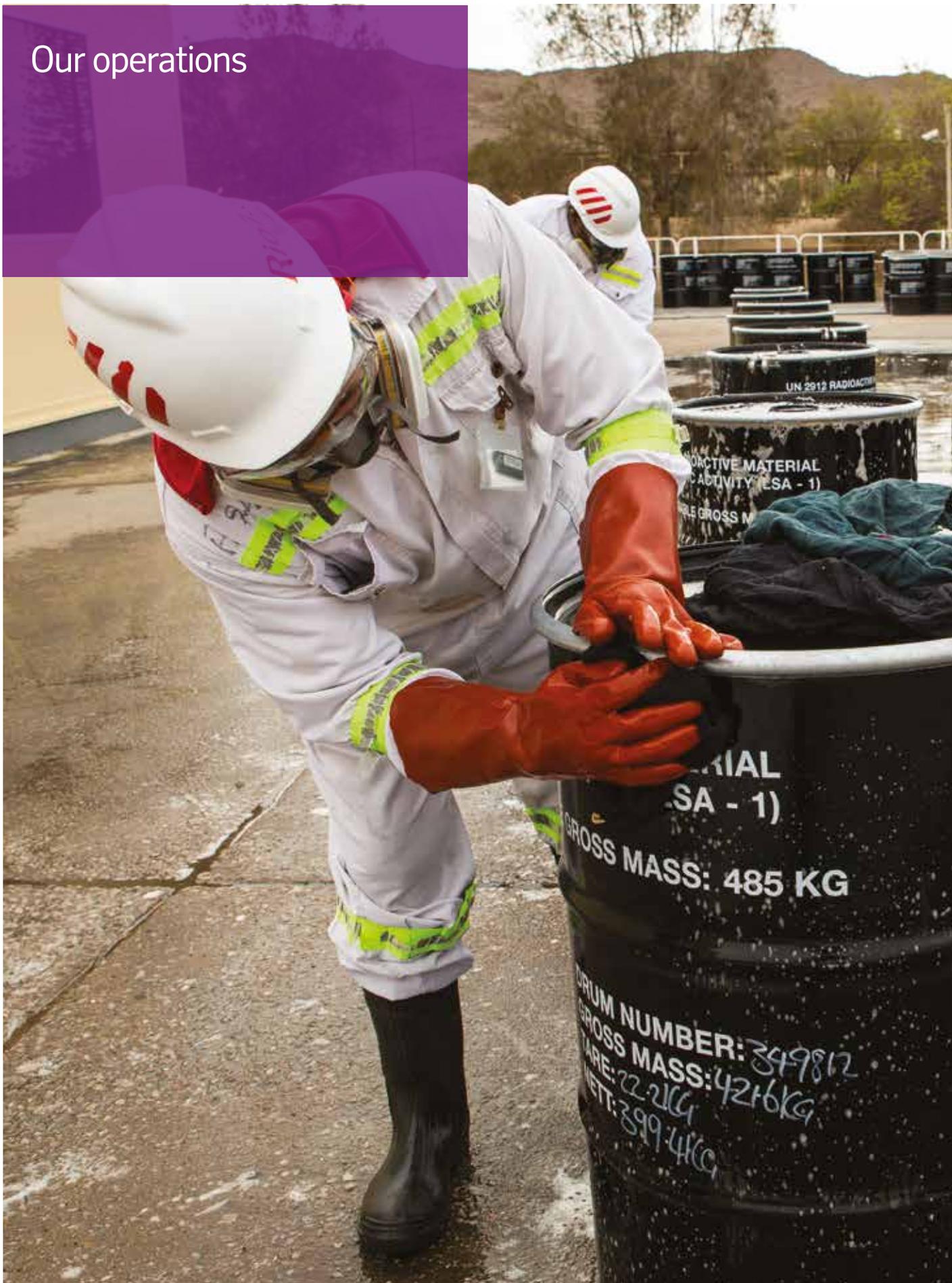
**Figure 2: Uranium spot prices (US\$/lb U<sub>3</sub>O<sub>8</sub>), 1985 to 2017**  
(US dollar per pound of uranium oxide, annual averages)



**Figure 3: Uranium prices (US\$/lb U<sub>3</sub>O<sub>8</sub>), 2005 to 2017**  
(US dollar per pound of uranium oxide)

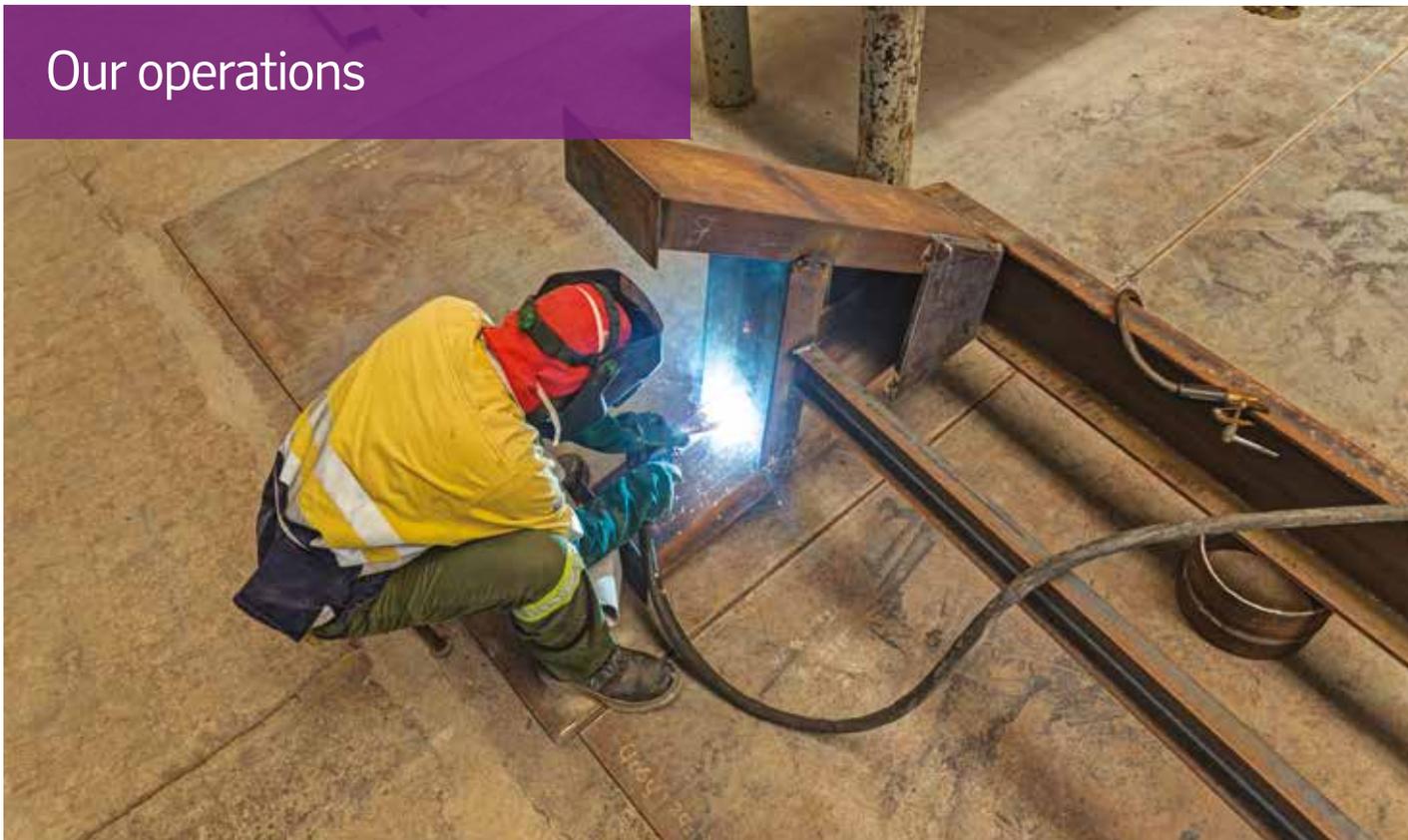


## Our operations



Drums filled with uranium oxide are wiped to remove residues prior to packing the drums in containers for shipment. Rinse water from the Final Product Recovery section is recycled into the recovery process to ensure contamination is not spread to other areas.

## Our operations



Artisan Elieser John, doing welding work at the mine's plate shop.

Rössing Uranium's operations consist of two distinct activities: mining uranium-bearing rock and processing this ore into uranium oxide for the world's nuclear energy market, which fuels the generation of electricity. Our attention is directed towards creating shareholder value and maintaining a secure and viable business, as well as ensuring that we remain a long-term contributor to Namibia's economy.

The uranium located in our mining licence area is embedded in very hard and abrasive granitic rock, known as *alaskite*. To move the necessary volume of ore and waste, the mine must conduct blasting operations regularly.

Electric and diesel-powered shovels load uranium-bearing ore onto haul trucks, which transport the ore to the primary crushers for the first stage in the crushing process. From there the crushed ore is conveyed to the coarse ore stockpile, where it is reclaimed and put through additional crushing stages in the Fine Crushing Plant, before the processing stage of operations begins.

### Mining operations

In 2017 we mined 25.2 million tonnes of rock (3 per cent more than in 2016) of which 9.6 million tonnes were uranium-bearing ore (20 per cent more than in 2016) and 15.1 million tonnes were waste rock removed from the pit (0.5 million tonnes were in-pit dumping). A waste-to-ore strip ratio of 1.57 was achieved which is significantly lower than 2016 at 1.97, and a ratio of ore milled to waste rock removed of 0.63.

This is a direct result of the Phase 3 pushback intersecting more ore with depth. For the first time, the contribution of ore from Phase 3 exceeded that of Phase 2.

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## 25.2 million

tonnes of rock were mined during 2017, compared with 24.4 million tonnes in 2016

## 9.6 million

tonnes of rock were uranium-bearing ore, compared with 8.0 million tonnes in 2016

## 15.1 million

tonnes of rock were waste rock removed from the pit, compared with 16.5 million tonnes in 2016

## 2,110 tonnes

tonnes of uranium oxide were drummed, compared with 1,850 tonnes in 2016

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# Our operations

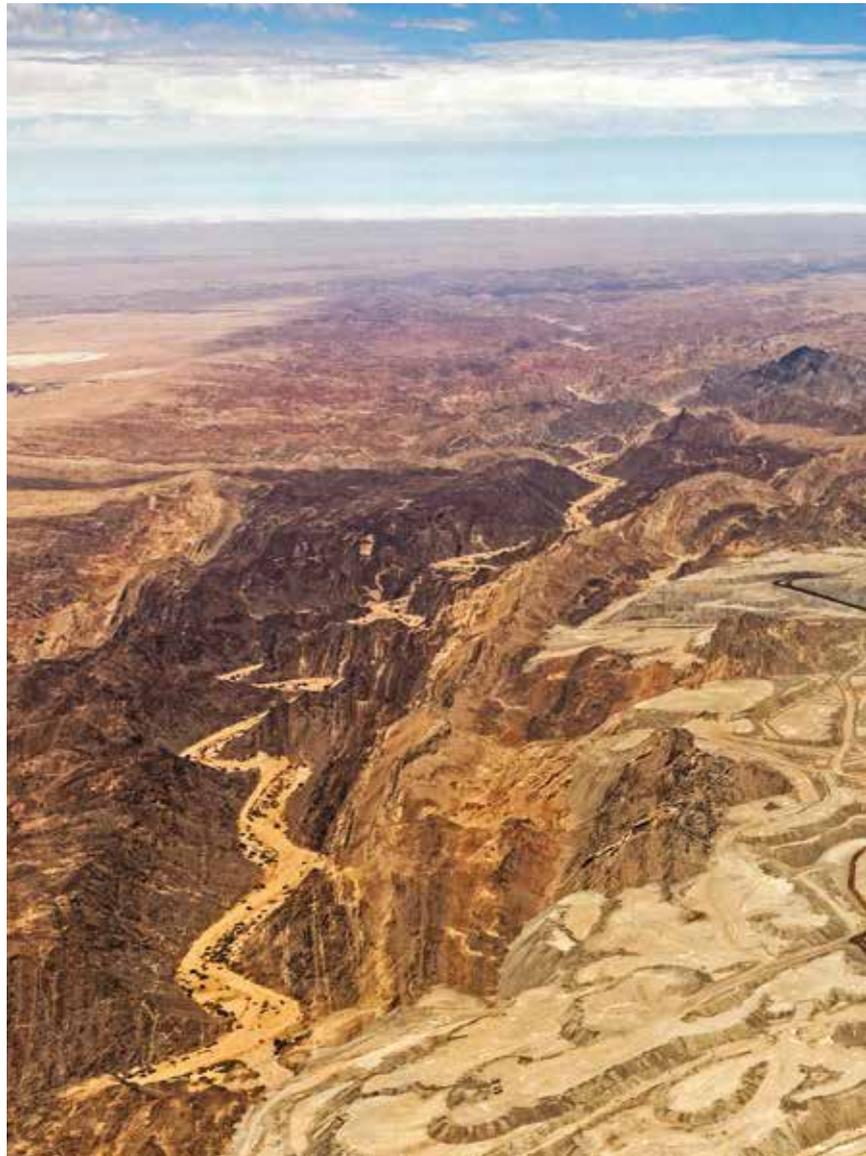
In addition to the increased ore tonnes, came higher uranium grades, as well as a higher calc index. Overall, the grade increased by 20 per cent while the calc index increased by 30 per cent.

A high calc index in the ore has an adverse effect on the extraction of uranium in the Processing Plant, specifically on the sulphuric acid consumption.

A key focus for the year was on trying to achieve a consistent ore blend to the primary crushers with the highest grade material, but at a calc index which the plant could handle. Operating with tight blending limits highlighted a number of areas for improvement which will continue to be a focus into 2018.

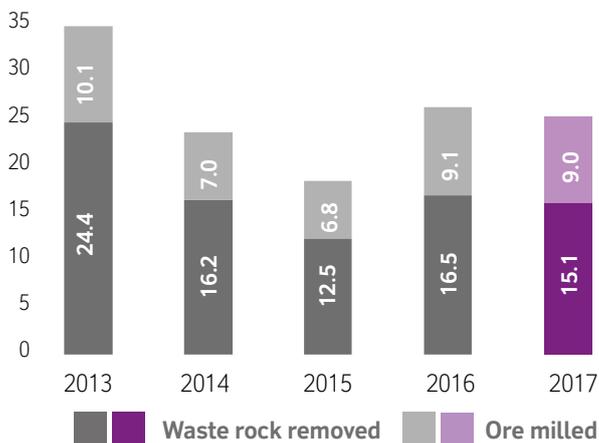
In addition, improvements were achieved in a number of other areas, including maximising haul truck loads.

In terms of safety, 2017 saw a continuation of the safety drives from 2016. The mining team (including the mine maintenance team) achieved a significant reduction in the number of injuries and severe incidents. Segregation of light vehicles and heavy mobile equipment continued and a number of projects were completed that have now almost eliminated this risk on the main access routes. The safety focus for 2018 will be on segregation on the benches in the open pit where traffic types are still mixed.

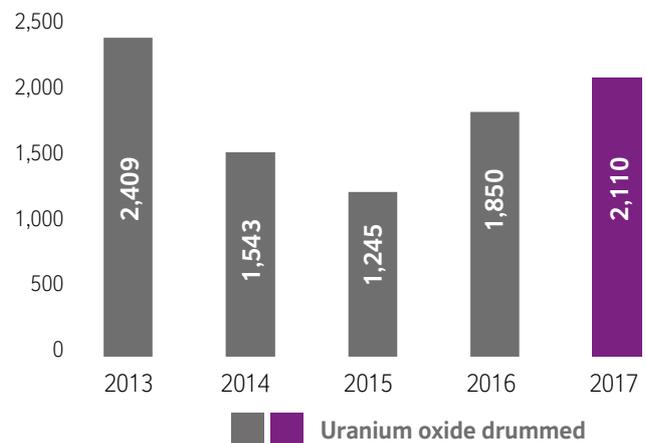


An aerial view of Rössing Uranium's mining operations.

**Figure 4: Production, 2013-2017**  
(million tonnes)



**Figure 5: Uranium oxide drummed, 2013-2017**  
(tonnes)





**Enhancing productivity and safety: finding shovel teeth**

During 2017 Rössing Uranium acquired state-of-the-art technology with the installation of a Ground Engagement Tools (GET) Trakka system.

The system provides support in the operations of heavy mobile equipment used in the open pit by detecting shovel-GET breakage. GETs are tips, lips and wing shrouds of shovels. Sensor tags are placed in a special recess in the shovel bucket GET and collect real-time digging information, which is wirelessly transmitted to a receiver in the shovel. We monitor 13 GETs per shovel bucket.

Upon breakage, an alarm is sounded in the shovel cab, alerting the operator of the breakage and enabling quick identification and removal of the GET and the safe return to production.

The value for Rössing Uranium is in the quick recovery of broken-off shovel bucket GETs before a GET is loaded onto a haul truck, ending up in the crushing circuit which could cause severe damage to crushing equipment and downtime. The implementation of the GET Trakka system provides greater production information and enhances safety and productivity. (See photograph on front page on the use of a GET Trakka scanner to locate broken-off shovel bucket tips or other parts.)



The mine's Final Product Recovery section with drummed uranium oxide ready to be loaded for shipping to our customers. The building on the left houses the new drum-filling machine — see below.

## New drum-filling machine ready to go

In 2017 a state-of-the-art uranium drum-filling system was installed in a new building adjacent to the Final Product Recovery Plant. This new system is a major improvement on the previous one, which was outdated and required on-going maintenance to keep it in working condition.

The new system provides a safer and zero-dust work environment, as well as increased drum-filling speed when the uranium oxide is placed in drums for transportation to our customers.

The drum-filling system is fully automated, allowing the washing of the drums to be done efficiently and safely. The uranium oxide is fed from a 20-tonne bin by screw conveyors to the drum-filling equipment. A roller feeds the empty drums to the drum-filling machine and after filling, another set of rollers takes the filled drums to a point where they are collected for storage.

Towards the end of the year the engineering and project teams completed a number of test runs successfully.



The recently installed drum-filling machine.



## Our operations

On the maintenance side, haul truck availability in 2017 was a particular highlight, exceeding target and continuing to feature as one of the best in the Rio Tinto Group, despite the age of our trucks and the trolley-assist lines.

In 2018 the productivity focus will shift to cycle times and better utilisation of the trolley lines, with the aim to lower diesel consumption.

While haul truck availability increased, shovel availability on the other hand represented a huge challenge during 2017 and will be a key area improvement focus for 2018.

### Processing operations

The Processing Plant is responsible for the extraction of uranium from mined ore through a number of stages to produce uranium oxide ( $U_3O_8$ ). This product is securely packed and shipped to our customers for further conversion.

The aim of the plant is to produce targeted quantities of uranium oxide in the most efficient and safe manner possible.

We drummed a total of 2,110 tonnes of uranium oxide in 2017 compared to 1,850 tonnes in the previous reporting year, representing a 14 per cent increase.

The old drum-filling machine will be kept intact to serve as a backup.

The French company ITEKS manufactured and installed the new system and provided extensive training.

Prior to installation, the system was constructed, assembled and tested in France before being crated for shipping to Namibia through the port of Walvis Bay.



The new drum-filling machine is fully automated; the washing of the drums is efficient and will create a clean and safe working environment.

## Engineering projects

### Maximising technology to increase efficiency and productivity

Several engineering projects were completed during 2017.

#### Replacement of reservoir

One project entailed replacing the heap leach reservoir at the Tailings Storage Facility (TSF) with a redundant tank from the mining area for use as a collection point for seepage water from the different trenches which is then pumped to the so-called lakes. This was necessary as the tank's structural integrity deteriorated over the years to the point where failure was imminent, therefore the decision was taken to replace the tank.

Transporting and placing the tank in its position was challenging due to the extremely steep and narrow road sections which had to be negotiated with a low-bed trailer and truck. Lifting of the new tank into position required a 220-tonne crane and a secondary 70-tonne crane. The new tank was commissioned on time and without any safety or environmental incidents.

#### Trolly-assist line at Haul road 16

Following the successful commissioning of Trolley 17 during 2016, equipping Haul road 16 with a trolley-assist line was another engineering project implemented in 2017. As Trolley 13 had not been used after 2016, it was decided to use the remainder of Trolley 13 equipment to complete Haul road 16. Considering the number of truckloads utilising Haul road 16, a tonnage and cash flow profile was derived reflecting a net present value of N\$21.4 million for the remaining life-of-mine period. Trolley 16 was successfully commissioned, with a cost saving achieved of approximately N\$1.8 million.

#### Speed and flow controls for pumps

The Projects department was also tasked to design and implement an alternative solution for speed and flow controls for pumps in the Processing Plant. Historically the mine has been using older-technology, hydraulic variable-speed couplings (VSCs) to control the speed of pumps and flow-rate in the plant. As state-of-the-art, variable-speed drives (VSDs) are more widely used, the older mechanical equipment has become scarce on the market, putting immense strain on maintaining them.



A rapid-motion scanner was used on storage tanks to evaluate the condition of the tanks' shell thickness. Employees of the contractor, Petro Base, operating the equipment are from left to right Clement Nduka and Ambrose Ezimoha, advanced non-destructive testing specialists, and Johan le Roux, managing director of Petro Base South Africa.

# Our operations

The project was a multi-disciplinary engineering project with a capital plan of N\$6 million which included the delivery and supply of various goods and services. It started mid-2016 and was completed mid-2017, due to long delivery times. This project has improved operational performance, maintenance tactics and reduced plant downtime. It is envisaged that the successful replacement of VSCs with VSDs will be continued during 2018, replacing the counter-current decantation feed pumps' VSCs with VSDs.

## Installation of in-vehicle cameras

Vehicles and driving are listed as Rössing Uranium's top critical risks for multiple fatalities. In an effort to reduce vehicle safety incidents or accidents, the engineering team commenced with the installation of in-vehicle cameras to all vehicles that leave the mine site, as well as to the haul truck and heavy mobile equipment fleet. The aim is to promote a safer and more responsible driving environment.

By early 2018, cameras have been installed in all manager vehicles, all buses and vehicles transporting our personnel and 60 per cent of the haul truck fleet. This project will conclude in mid-2018.

## Rapid-motion scanner

Demonstrating the engineering team's commitment to working smarter, in another engineering project, the latest technology, rapid-motion scanner (RMS), which is an automated ultrasonic scanner, was used for the first time to carry out ultrasonic testing on tank shells. In line with our storage tanks inspection standards and equipment integrity maintenance process to ensure compliance with the statutory requirements, the condition of four of our onsite tanks in the Processing Plant were evaluated in terms of shell thickness.

The RMS scanner provided safer remote access and no scaffolding or other working-at-height equipment was required to access the higher areas of the tank. In addition, the RMS scanner allowed the team to work faster as the scanner crawled up and down the tank shell at high speed with real-time image display, thus enhancing productivity. The 3D view of the data, clearly showing any defect in the tank thickness, further increased accuracy.

The team has several projects planned for 2018. Among others, the team will upgrade the seepage water recovery system, returning it to a physical condition that will allow operation for a further 30 years, which is 20 years beyond the expected life-of-mine.

Groundwater control and monitoring systems will be reviewed and modernised. The project involves upgrading the monitoring network and to fully automate the system, enabling control from Central Processing Control.

## Information technology

Two years ago a lost-opportunity reporting system (LORS) application was implemented. LORS is used to record production downtimes and the reduction of production capacity. The need to record downtime events and reduced feed is critical to help the mine's operations focus on specific areas and specific equipment to ensure optimum and continuous production.

During 2017, in line with Rössing Uranium's critical equipment reliability (CER) mandate, a renewed focus was placed on the information obtained from LORS. With the creation of two new reports, the technical team is now able to get downtime information for individual equipment, as opposed to downtime areas only as reflected in previous reports. The team is now able to view the performance statistics of each item of equipment, which they can then use for maintenance planning.

In addition a contractor-management mandate was established during the previous reporting year to focus on the full governance and administration process of contractors. During the year under review the IT team undertook a gap analysis of these systems at Rössing Uranium operations. This process determined if the current state of the site's contractor-management system is in alignment with the Rio Tinto Contractor management excellence (CMX) programme and provides information to develop a CMX improvement plan.

Based on its findings, several projects were successfully implemented in 2017, such as the upgrading of the current access-control system to provide accurate clocking data and the seamless integration of gate data with contractual terms to ensure accurate invoicing of contractor labour, equipment and material.

In addition, a new application system was developed to maintain administrative data of the contractor employees onsite which contributed to the streamlining of the engagement, extension and termination processes. This application provides key information on the contractor employees, numbers per contracting company and expiry dates, among others.

The roll-out plan of the CMX framework has been finalised and the implementation and embedding of this framework will continue during 2018.

## Our people



Inana Johannes, a Boilermaker from the mine's plate shop, working safely on a project.

## Our people



In September 2017 Rössing Uranium celebrated the memorable careers of our long-service employees during a cowboy-themed gala dinner when eight 40-year, twelve 35-year and four 30-year service awards were handed to employees.

Aspiring to be an employer of choice, Rössing Uranium provides long-term and rewarding employment. We believe that through employment creation we are making significant contributions to society and the economy. We recognise the importance of attracting, developing and retaining people with diverse backgrounds in our business and realise the benefits of developing the skills of others.

### Workforce at a glance

At the end of 2017 Rössing Uranium had a workforce totalling 956 employees (which included 33 temporary employees), slightly more than the 949 at the end of the previous reporting year. The average number of contractors at the mine increased from 752 to 964.

### Employee relations

Employee relations continued to be an important focus area for our business during 2017 as we strive to maintain harmonious relations with our workforce. There were no work stoppages in 2017. A monthly company-union forum takes place where both sides discuss issues and resolve matters. Rössing Uranium and the Rössing Uranium branch of the Mineworkers Union of Namibia signed a two-year salary agreement for the period 2018 to 2019.

### Inclusion and diversity

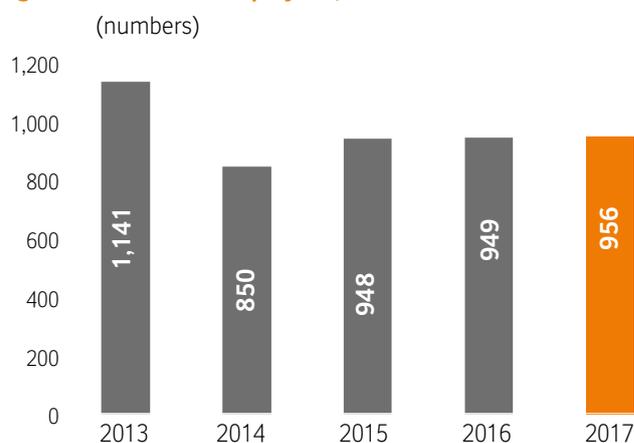
Inclusion and diversity remains a key initiative that serves as the foundation for accelerated development and retention. Our workforce numbers have been stable over the past four years (see the table on this page).

### Recognising our employees

Rössing Uranium is committed to recognising our employees as a means of improving employee morale which drives performance excellence and engagement. The *Making a Difference* (MAD) programme has grown since its inception in 2012.

With our defined values of safety, teamwork, respect, integrity and excellence, we recognise and reward our people's efforts in their quest for excellence. During 2017, 333 employees received recognition awards, which is the highest number since inception of the programme.

Figure 6: Number of employees, 2013-2017



## Capability and development

Capacity building at Rössing Uranium is a critical process aimed at enhancing productivity and organisational performance. The Training and Development section supports the mine's strategy to achieve its objectives by providing support and services to the various departments through collaboration and partnerships. Various initiatives were implemented in the reporting year, supporting the company in achieving our goal of empowering and developing our workforce, which is highlighted below.

### Employee engagement: the WHY project

During 2017 Rössing Uranium initiated the WHY project, which aimed to achieve alignment across the business in terms of our values and also to entrench the concept of *#onlytogether*, promoting the idea that only by working together can we achieve our goals. This programme involved all employees and contractor leaders. New employees will be involved in the programme on a continuous basis.

### Rio Tinto People Survey

Rössing participated in the Rio Tinto Group-wide People Survey which took place during April and October 2017. The People Survey provides employees with an opportunity to share their views on various aspects of the business. The aim of the survey is to listen, obtain input from employees, learn from the feedback and improve the business with focused actions on an on-going basis. This will result in a safer and inclusive environment where people are empowered to perform, challenge, develop and excel.

In the Rio Tinto Group, Rössing Uranium had one of the highest scores in both surveys, indicating that those who responded to the survey have a largely favourable view of working at the mine. In addition, various focus groups were conducted to obtain more information from the workforce on areas of improvement. This provided the company with valuable information, serving as a basis for a better understanding of our people.

### Educational support

Developing young Namibians is part of our corporate social responsibility as it contributes to the growth of the nation at large and ensures the development of skills. A total of ten bursary students received support from Rössing Uranium at a total investment of N\$1.1 million (excluding vacation work).



Rössing graduates share their success stories on the Day of the African Child at the Kolin Foundation Secondary School in Arandis. From left are graduates Andriana Mutimili, Liinda Shipahu and Hanna Uunona.

Five new bursaries in the fields of civil and mechanical engineering were awarded during 2017 for the 2018 academic year in line with operational requirements as determined by our manpower plan. Five existing bursaries were renewed during the same period.

The mine's educational assistance scheme for employee dependants at tertiary education level supported 34 dependants at a total investment of nearly N\$0.5 million. A total of 30 trade apprentices completed their job attachments as part of their tertiary education curriculum, exposing them to on-the-job learning opportunities within their various disciplines. Further opportunities to support trade apprentices will continue during 2018.

### Vocational Education and Training Levy

Rössing Uranium has participated in the Namibia Training Authority's Vocational Education and Training (VET) Levy submission since its inception. Through its contribution, the mine has contributed N\$6.4 million during the 2017 training-levy cycle.

# Capability and development

## Technical training

Technical training remains pivotal to ensure that the knowledge, skills and attributes of our workforce are enhanced. In 2017 various training interventions to drive efficiency and effectiveness were conducted to ensure that skills are imparted at the right levels. Shovel efficiency was identified as an area where practical on-the-job training for operators and maintainers was required.

In addition, as part of uplifting the technical skills of our maintenance teams, the need was identified to facilitate programmes on the basics of electrical and hydraulic components of auxiliary equipment. In an effort to ensure a blended approach to learning is maintained, additional e-learning modules on various heavy mobile equipment will be rolled out during 2018.

Workforce profile	2013 (%)	2014 (%)	2015 (%)	2016 (%)	2017 (%)
Historically disadvantaged Namibian men	79.1	76.0	77.1	78.2	77.0
Historically disadvantaged Namibian women	13.7	16.0	15.7	15.5	16.3
Previously advantaged Namibian women	1.1	1.6	1.7	1.5	1.4
Previously advantaged Namibian men	4.5	4.7	3.7	3.0	3.6
Non-Namibian men	1.6	1.6	1.5	1.5	1.4
Non-Namibian women	0.0	0.0	0.1	0.1	0.1
Persons with disabilities: men	0.2	0.2	0.2	0.2	0.2
Persons with disabilities: women	0.0	0.0	0.0	0.0	0.0

## Statistical information on our workforce, 2017

Local and foreign employees:

- Namibians: 98.4 per cent (941)
- Non-Namibians: 1.6 per cent (15), including:
  - 0.5 per cent (5) work permit holders, and
  - 1.1 per cent (10) permanent residence permit holders
- Female representation: 17.8 per cent (170)
- Average age of new employees: 31 years
- Average age of all employees: 38 years
- Number of employees who left the mine's employment: 72
- Number of new employees recruited: 80

## People supported by Rössing Uranium — 2013 to 2017: Number of participants in training and development programmes

Nature of participation	December 2013	December 2014	December 2015	December 2016	December 2017
Trade bursaries	54	20	10	0	0
Trade job attachments	0	0	10	10	30
Apprentice employees	2	2	1	0	0
College/university bursaries	23	16	10	11	10
College/university job attachments outside company bursary scheme	0	3	0	3	2
Employees enrolled at a technical college (full-time studies)	0	1	1	1	0
Employees enrolled at a college/university (full-time studies)	2	3	3	2	3
Employees involved in correspondence programmes	5	4	12	8	19
Employees enrolled in the Leadership development programme (in-house)	0	0	0	64	0
Rössing Uranium dependant scholarships awarded	35	31	25	26	34
Employees in limited-contact studies in various fields	2	5	3	5	3
<b>Total number of participants</b>	<b>123</b>	<b>85</b>	<b>75</b>	<b>130</b>	<b>101</b>
<b>Training programme costs — this figure includes all other training initiatives carried out as part of capability development</b>	<b>N\$5.6 million</b>	<b>N\$6.1 million</b>	<b>N\$5.4 million</b>	<b>N\$7.6 million</b>	<b>N\$8.5 million</b>

## Ensuring people are healthy and safe



A new facility in the form of a training zone was launched in 2017. The purpose of erecting this training zone is for trainees to practically conduct hazard identification exercises in a controlled environment, and to improve general safety awareness on various HSE aspects and risks.

The health, safety and well-being of our employees come first. We understand that our operational environment may be hazardous. For this reason the identification and management of material risks are crucial in our business approach. We consistently strive to create a zero harm working environment, regardless where our people work or what type of work they are engaged in.

We are committed to zero harm and have put in place rigorous processes to ensure that every employee and contractor finishes his or her work day as safely and as healthy as they were when they reported for work. Every day we strive to eliminate fatalities while reducing the number and severity of injuries.

Utilising a formalised, integrative Health, Safety and Environmental (HSE) management system is essential in enabling Rössing Uranium to optimise, coordinate and manage our operations, personnel, plant and equipment. This management system also informs our

interactions with the environment and communities in a manner that demonstrates the company's consistent application of best practices.

The structure of the HSE management system generally follows the layout of common international standards such as the International Organisation for Standardisation (ISO) 14001 (Environment) and the Occupational Health and Safety Advisory series (OHSAS) of British Standard (BS) 18001. The HSE management system is designed to assist in the achievement of our HSEC goals, which include our legal obligations.

An auditing programme periodically evaluates the effectiveness of our HSE management system. All potential impacts are listed on a risk register with related mitigating and operational controls. However, our approach to the health and safety of our employees goes beyond compliance and we seek to achieve year-on-year improvement.

## HSEC Policy

# Health, Safety, Environment and Communities

Excellence in Health, Safety, Environment and Communities (HSEC) management is one of the foundations of Rössing Uranium's vision to be the safest and most efficient, long-life uranium producer in the world. This is in line with our commitment to Zero Harm, corporate citizenship, social responsibility and sustainability.

To accomplish this, Rössing Uranium is committed to:

- The protection of the health and safety of our employees, contractors, stakeholders and neighbouring communities.
- Operating our business with respect and care for both the local and global environment in order to prevent and mitigate residual pollution.
- Understand and manage the effects of our product through its entire life cycle.
- Work with integrity and be in full compliance with applicable legislation and industry best practice.
- Seek continual and sustained improvement in HSEC performance to create a Zero Harm work environment.
- Identify and assess hazards arising from our activities and manage associated risks to the lowest practical level.
- Enhance biodiversity protection by assessing and considering ecological values and land-use aspects in investment, operational and closure activities.
- Continue in our efforts to raise the awareness of HSEC issues in our neighbouring communities.
- Regularly review our performance and publicly report our progress.
- Communicate our commitment to this HSEC policy to all interested and affected parties.

In implementing this policy we will engage in constructive dialogue with our employees, contractors, neighbouring communities and all other stakeholders in sharing relevant information and responsibilities for meeting our requirements.

  
**Werner Duvenhage**  
Managing director  
January 2018

**RioTinto**  
Rössing Uranium  
Working for Namibia

# Ensuring people are healthy and safe

## Occupational health management

We proudly maintained our certification for ISO 14001:2004 in 2017.

We firmly believe that occupational disease and illness can be prevented, provided that risks are properly identified, managed and controlled. Our occupational health, hygiene and wellness programmes are aimed at preventing ill health, but also promoting good health and well-being.

We identify and quantify health hazards to enable us to minimise exposure and prevent injury and illness that may otherwise develop. In adherence to legislative requirements as well as to the risk-based occupational health standards of Rio Tinto, some of our key programmes include, but are not limited to:

- noise exposure control;
- workplace ergonomics management;
- health and medical monitoring;
- hazardous substances exposure control; and
- fitness for work and fatigue management.

### **Occupational medical surveillance**

Occupational medical surveillance examinations provide baseline and periodic measurements to detect abnormalities in workers exposed to work-related health hazards early enough to prevent or limit disease progression through exposure modification or medical intervention.

At Rössing Uranium, a risk-based periodic medical programme is followed with consideration of the exposures of employees and contractor employees in different similar exposure groups (SEGs). These require employees and contractors to undergo pre-employment, periodical and exit medicals.

SEGs refer to groups of Rössing Uranium workers and site contractors who experience exposures similar enough that collecting exposure samples from any representative from the sub-group of workers provide useful data in terms of predicting exposures of the remaining workers.

Other medical examinations during employment include transfer medicals and return-to-work fitness medicals. Through the mine's workplace wellness programmes employees are encouraged to

undergo additional medical screening tests to manage their own health and as a means of detecting chronic and/or life threatening illness.

### **Wellness**

Our workplace wellness programmes are designed to help us in creating a work environment that is healthy for our employees. Encouraging employees to look after their health and well-being is a critical component of our overall approach to health and safety. The programmes also involve increasing knowledge and awareness through campaigns and education sessions and introducing policies that help employees make healthier choices. Various activities were undertaken during 2017 to support the following programmes:

#### **Wellness week**

In collaboration with Namibia Health Plan (NHP), Rössing Uranium's annual Wellness week was held onsite for the fourth consecutive year during August 2017. A total of 334 employees and 244 contractors received wellness screenings during this week.

#### **Blood donation clinics**

The Blood Transfusion Service of Namibia held three blood donation clinics onsite, during which a total of 160 units of blood were donated. In recognition of the employees' support, we received the Namibian Blood Transfusion Coastal Industrial Award (Gold) at a special event.

### **Occupational hygiene**

Our workplace health exposure monitoring programmes are designed to quantify potential emissions and exposures with the aim of controlling harmful health risks and agents. We have a risk-based monitoring plan which is reviewed annually. During 2017, we had 20 SEGs which were monitored.

Monitoring data is used to better evaluate the risk to people in our workplace and to assist in determining the effectiveness of risk-mitigating controls, compliance with legal requirements, our requirements of the Rio Tinto management system and health performance standards and progress against our objectives and targets.

To ensure that collected data is accurate, comparable and representative statistical analysis and validation is conducted. Internal criteria are established to protect the health of all our workplace personnel, including contractors, and they are defined as occupational exposure limits (OELs). Non-conforming monitoring results are investigated through the incident management process and appropriate actions are developed and implemented to rectify the non-conformance.



Laboratory technician, Cornelius Manjara, of the chemical laboratory at the mine is preparing a test sample from milled rock from the open pit.

Some of the health risks and agents at our workplace include exposure to noise, dust (silica), musculoskeletal stressors and microbiological agents found in the water system.

During 2017 our occupational hygiene monitoring programme included measurements of noise levels, respirable dust (including crystalline silica quartz), welding fumes, compressed-air quality (aero testing) and water-borne bacterium (*Legionella* and potable water).

### **Dust**

Our mining activities, such as the blasting, drilling, loading and hauling of ore on unpaved roads are typically the major sources of dust emissions. Transfer and pulverising of ore, which is mostly dry, at the primary crushing circuit and Fine Crushing Plant hugely contribute to high levels of fine dust concentrations, which are experienced at the Processing Plant and surrounding work areas.

During the reporting year, our dust monitoring was focused mostly on crystalline silica quartz. Silica is a natural substance found in our ore; when the ore is processed, dust is created. Some of this dust is fine enough to reach deep inside the lung; this is known as respirable crystalline silica (RCS).

During 2017 we collected 84 RCS samples from ten SEGs, applying the Rio Tinto OEL of 0.1 mg/m<sup>3</sup> for RCS. Monitoring results are reported not taking into consideration the protection factor of personal protection equipment (PPE). Although the laboratory workers SEG exceeded the OEL, they are adequately protected

through the use of respiratory protection. Respiratory protection is mandatory in this area. Figure 7 on the next page depicts the average personal respirable silica dust based on the OEL of 0.1 mg/m<sup>3</sup>.

The primary reasons that the dust recorded in 2017 was excessive include, among others, engineering controls which were not effective, inconsistent application of work practices aimed at reducing dust, and limited water resources. A review of all dust control and the implementation of the dust-control strategy will be the main focus in 2018.

### **Noise**

The aim of our hearing-conservation programme is to protect our workers' hearing, mainly because over-exposure to sound above the stipulated OEL of 85 dB (A) can result in noise-induced hearing loss, which is irreversible. This can be aggravated by simultaneous exposure to some chemical substances, for example carbon monoxide and solvents. Noise may also have an adverse effect on other systems, including the body's cardiovascular system.

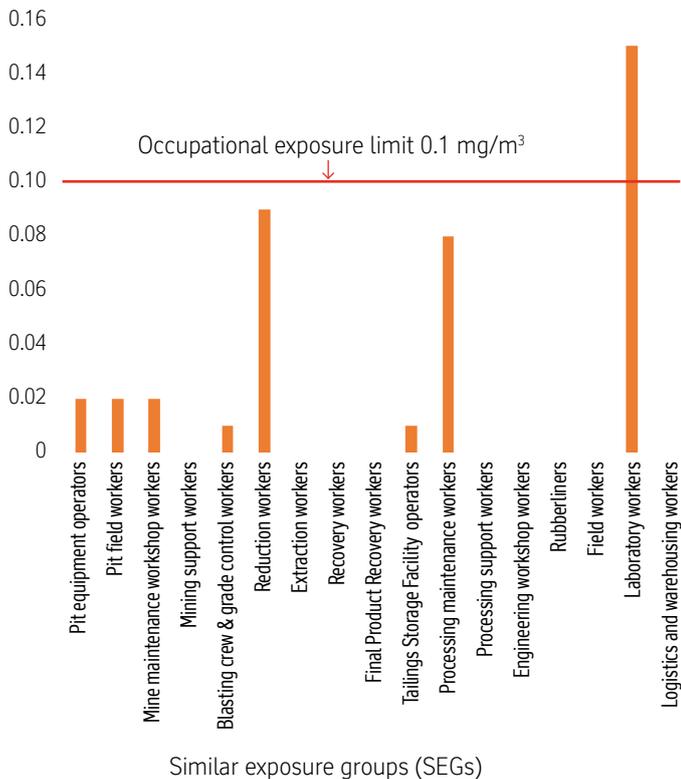
Mining equipment, combined with high volume settings on two-way and FM stereo radios in the equipment cabins, as well as general plant and equipment noise, are the main sources of over-exposure to noise at the mine site. Noise zoning is applied in high-risk areas, together with the application of customised hearing-protection devices. In other areas, disposable ear plugs are used, as and when necessary.

# Ensuring people are healthy and safe

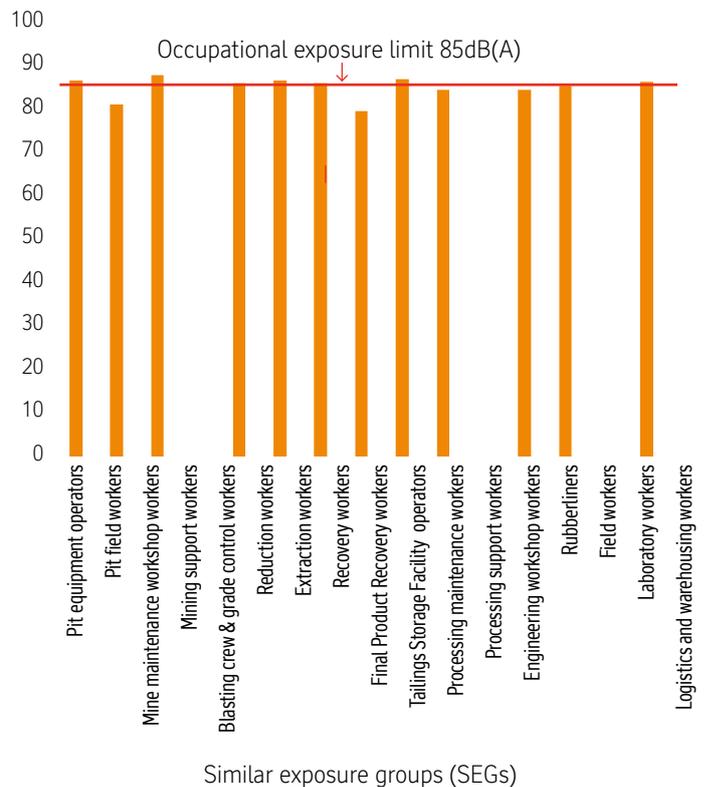


Advisor for Occupational hygiene, Lulia Hamutenya, taking a noise level reading at one of the mine's workshops.

**Figure 7: Average personal dust exposures, 2017**



**Figure 8: Average personal noise exposures, 2017**



Monitoring results are reported not taking into consideration the protection factor of personal protection equipment (PPE). All employees who work in dust or noise high-risk areas are issued with customised respiratory- or hearing-protection devices. These devices are maintained and fit-tested on an annual basis. **Measured exposures indicated in Figures 7 and 8 do not take into account the protection factor provided by these devices.**

During 2017, eight of the 12 SEGs that were monitored exceeded the occupational exposure limit of 85 dB (A). *These measured exposures do not take into account the protection factor provided by the hearing-protection devices in use.* The primary reason for these eight exceedances include the use of impact tools, general plant noise, noise from heavy mobile equipment, maintenance tasks, and high volumes on two-way radios.

Figure 8 on the previous page depicts the average annual personal noise exposures measured for the different similar exposure groups in the reporting year.

Hearing-protection devices (ear plugs, ear muffs and customised hearing-protection devices) are our critical control for noise exposure. In 2018 we will continue to focus on ensuring consistent and correct usage of these devices. Supporting these actions, we will implement a hearing-protection, fit testing validation programme for disposable ear plugs.

We also plan to roll out a technology-based, fatigue risk assessment programme to enhance understanding of our risk and improving on the mine's fatigue management controls.

To remain aligned with global and local, emerging health threats and managing these pro-actively, a mental health programme will be designed and rolled out.

Monitoring dust exposure and supporting the implementation of the dust management plan will remain a key focus area throughout 2018.

## Safe operations

Safety is a core value for Rio Tinto and Rössing Uranium as encapsulated by the words of Rio Tinto chief executive, J-S Jacques, who stated: "We must check that it is safe to start work, remain vigilant to hazards and speak up if something is not safe. This is a shared responsibility — to ourselves, to our families and friends and to each other."

We continued to build on our safety performance and are proud to have ended the 2017 year with an improvement in our All-injury Frequency Rate of over 50 per cent compared with the previous year.

The mine recorded an All-injury Frequency Rate (AIFR) of 0.39 for the year, against a target of 0.67. This AIFR is the best result achieved in the last ten years (see Figure 10 on page 31). The mine had eight months with no recordable injuries reported — an indication that zero harm is achievable.

The following injuries occurred during the 2017 reporting period:

- Lost-day injuries: three (a reduction of two compared with 2016).
- Medical treatment cases: four (a reduction of six compared with 2016).
- Incidents requiring basic first aid: 28 (a reduction of one compared with 2016).

The mine experienced three potentially fatal incidents (PFIs) which is four less than the seven PFIs that occurred in 2016.

Highlights in our safety management during 2017 included the following:

- A safety team from Rio Tinto carried out a safety diagnostic review of our existing systems and culture. They conducted workshops with a cross-section of our employees and contractors and thereafter provided us with a number of examples to further improve our safety record. A follow-up review was conducted six months later.
- A sectional housekeeping competition was held, driven by OHSE representatives. The purpose was to improve general housekeeping around the mine site, as well as to install a sense of pride in individual workshops. The competition took place every quarter and the winners were presented with tokens of appreciation at a prize-giving ceremony.

# Safe operations



Warehouse officer, Gaston September, at the Critical risk signboard at the mine's central store. Our Critical risk management (CRM) programme aims to create a fatality-free working environment for our employees and contractors. CRM boards are placed strategically on the mine site to serve as a constant reminder of risk areas.

The safety of our people remains key in everything we do. We made great strides in reducing the number of potentially fatal incidents and improved our All-injury Frequency Rate with 50 per cent compared with the previous year.

- Working at heights is one of our critical risks. During the year an in-depth review of all our tasks involving working at heights was conducted, which provided opportunities to implement a number of improvements, for example implementing a work-at-heights permitting system.
- We launched a training zone, an area that highlights some of the potential hazards which can be experienced in our working environment. The area is used during annual inductions as an education and awareness tool to demonstrate to employees and contractors specific hazards, such as damaged lifting equipment, waste segregation practices and electrical safety devices.
- Focus group meetings were held with small teams to go through serious incident scenarios which have occurred within the Rio Tinto Group to discuss findings. This ensured that key lessons were communicated in a more sustainable manner in an attempt to prevent such incidents from happening again.
- No major safety issues were identified during the Business Conformance Audit (BCA). This is an audit carried out every two years by a Rio Tinto team and covers all of our HSEC standards.

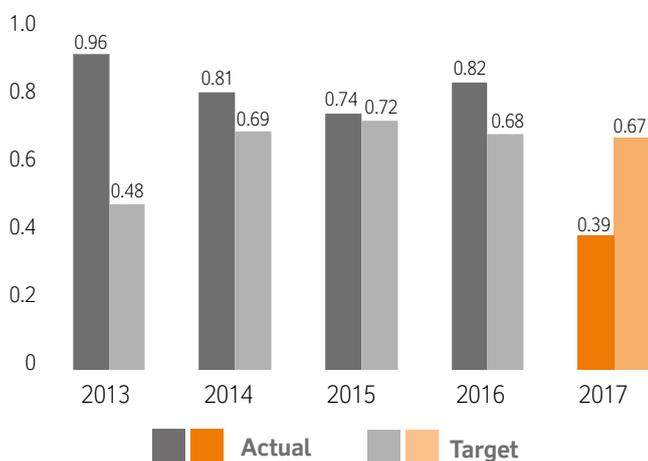
- External auditor PricewaterhouseCoopers conducted a sustainability development assurance audit, evaluating how we capture and record our injury-classification data. No negative findings were recorded.
- *Fundamentals of Process Safety* training was provided to key personnel involved in our Process safety management (PSM) system. PSM focuses on the low probability/high consequence incidents, for example fires or explosions.
- The Rio Tinto Group experienced a serious incident involving rail operations in one of its mining operations. Post-incident evaluation led to a group-wide rail safety assessment and gap analysis, leading to new procedure on how rail operations are to be conducted worldwide. Rössing made good improvements and benefited greatly from this process.
- We achieved a Critical risk management (CRM) score of 3.14 against the target score of 3.00 which is an improvement on the target score.
- The Rössing Uranium safety team actively participated in the Chamber of Mines of Namibia's Safety Committee in 2017.

Although we made great strides in reducing the AIFR, the number and severity of injuries and reducing the number of PFIs, we are still injuring employees and contractors. This is not in line with our goal of zero harm which is that everyone goes home safe and healthy at the end of each working shift.

To enable us to achieve our goal of creating and sustaining a safe, caring workplace, the following will be amongst the focus items during 2018:

- achieve the CRM target score of 4.00 for the sustaining phase of the fatality elimination methodology;
- conduct a gap analysis to determine how our procedure related to the transport of people (focusing specifically on vehicles able to transport nine or more people) should be adapted to align with the Rio Tinto C3 Vehicles and Driving standard;

**Figure 9: All-injury Frequency Rate (AIFR), 2013-2017**  
(per 200,000 hours worked)

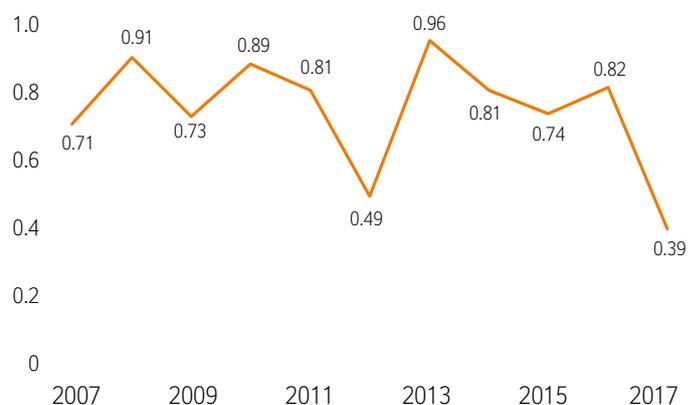


# 50%

improvement in our All-injury Frequency Rate (AIFR) of 0.39 compared with 0.82 the previous year. This is the best AIFR achieved in the past ten years.

- implement a new explosives procedure;
- carry out a review of all tasks involving working on or close to live equipment, which will provide opportunities to reduce the amount of live work carried out, for example perhaps by use of technology distancing devices to remove the person from the hazards;
- review our high consequence/low probability risks and engineering those risks out as far as reasonably practical;
- develop and provide PSM training to all levels of the business;
- continue with the safety initiatives started during 2017; and
- review our HSEC training methodology to improve efficiency.

**Figure 10: All-injury Frequency Rate (AIFR), 2007-2017**  
(per 200,000 hours worked)



## Radiation safety

The primary aim of radiation safety is to assess, quantify and control the risk of radiation exposures in the workplace. In our Radiation Management Plan (RMP) we provide a comprehensive summary of the risk assessments, sources and receptors, and controls implemented. Our RMP is updated annually and anyone can access it via our website via the 'Reports and Research' tab.

The National Radiation Protection Authority (NRPA) audits the implementation of our RMP annually and we provide a narrative report on it to the NRPA. The RMP implementation reports for the past few years are also available for download on our website.

Workers who are considered to be at an elevated risk for radiation exposure are termed 'radiation workers'. We consider anyone at risk of receiving an annual dose of 5 milli-sieverts (mSv) (from all exposure pathways combined) or more, to be a radiation worker.

All the workers belonging to the Final Product Recovery and the Recovery similar exposure groups (SEGs) are classified radiation workers. Workers in these groups receive continuous gamma monitoring in the form of a thermo-luminescent dosimeter, replaced at intervals of three months. They also undergo monthly urine testing to check for accidental ingestion of uranium. Female radiation workers undergo monthly pregnancy testing to enable prompt removal of pregnant employees from this working area.

In 2017 we performed 800 urine samples, without exceeding the warning level for uranium in urine which is 20 micro-grammes per litre ( $\mu\text{g/L}$ ). We also performed 37 pregnancy tests of female radiation workers, as well as 65 pregnancy tests of females not classified as radiation workers who submitted to the testing on a voluntary basis — seven of these tests were positive.

Over the years we have gathered a comprehensive database of radiation exposure measurements by pathway and by SEG. Although not needed in terms of risk, we continue to monitor three radiation exposure pathways for each SEG randomly every year.

In 2017 we collected over 600 personal radiation exposure samples and many more additional samples of area dose rates. In addition, we have a continuous record of the gamma dose for radiation workers. No worker received a dose exceeding 5 mSv during the reporting year. The

average annual dose when averaging over the entire workforce was again 1 mSv, as has been recorded consistently for the past five years.

Assuming a working year of 2,000 hours, the annualised and averaged dose by SEG is displayed in Figure 11 on page 34. The average annual dose is shown for each SEG, broken down into contributions from gamma radiation, dust inhalation and radon inhalation. The dose value recorded in 2016 is shown to indicate the variability of the measurements. The weighted annual dose, 1 mSv per annum, is displayed as a dotted green line.

The area exhibiting the highest risk in terms of radiation exposure is the Final Product Recovery (FPR) area. The area is a controlled radiation area with access restriction, fingerprint access and contamination checks for exiting personnel. We perform regular monitoring of surface contamination, inhalation dose rates for radioactive dust and area gamma dose rates.

To optimise these variables, we set a target of a maximum average surface contamination of 1 Bq per square centimetre ( $\text{Bq/cm}^2$ ) for the area, and a maximum average dust inhalation dose rate of 10 micro-sieverts per annum ( $\mu\text{Sv/h}$ ).

In 2017 we significantly improved on the controls for dust and contamination in the area. And we have been able to meet both of the targets with an average surface contamination measured at 1.0  $\text{Bq/cm}^2$  exactly, and an average dust inhalation dose rate (without taking into consideration the protective factor offered by the use of respiratory protection) of 4  $\mu\text{Sv/h}$ .

The FPR area exhibits five stacks, three of which are low-emission venting stacks from the FPR building and two of which hail from the FPR roasters. As the latter two are fed with the exhausts from the uranium-roasting process, the emissions need to be closely monitored and controlled.

For the past ten years the emissions from each stack were monitored on an annual basis by an external, accredited consultant. This monitoring allows us to draw conclusions about the efficiency of the water-based, stack-scrubbing systems. It also enables us to calculate the annual emission of the total particulate matter from the stacks by extrapolation from the sampling result.

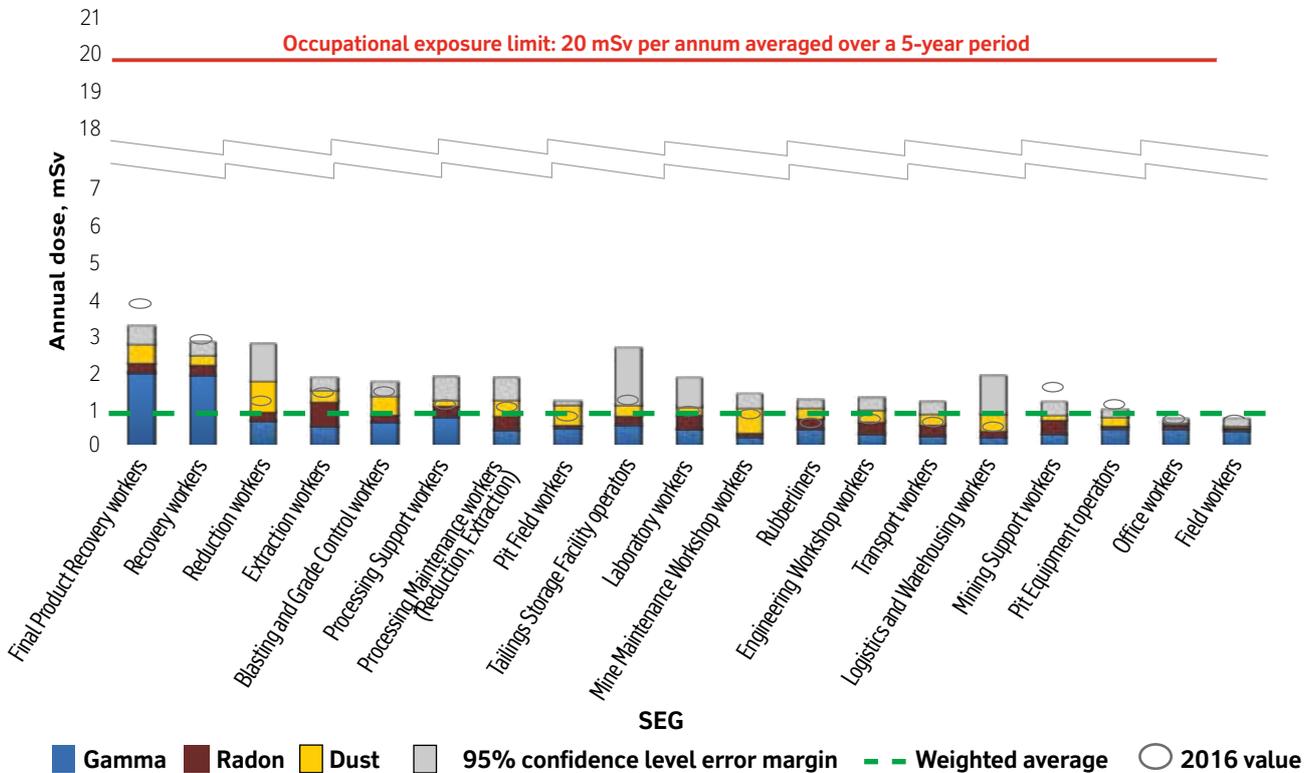
Because of the large variability of stack volumetric flow rate and scrubbing efficiency, the annual monitoring frequency proved to be unreliable in yielding representative results. Based on the extrapolated results from the past years, we realised that the stack scrubbing efficiency needs to be improved and monitoring needs to take place continuously.



Nelao Endjala, advisor radiation safety, at one of the tanks in the Processing Plant, with an Automess Teletector Probe instrument which is used to measure levels of gamma radiation in hard-to-access places, such as inside tanks.

# Safe operations

**Figure 11: Personal radiation exposure dose by similar exposure group (SEG), 2017**  
(Annual dose in milli-sieverts)



We therefore designed a new stack-scrubbing system due to replace the old scrubbers in 2018 and procured equipment to transition from annual to continuous monitoring.

Mid-year we discovered that one of our officers had falsified some results that were to be collected for monitoring radioactive surface contamination in the FPR area. While this type of monitoring does not form part of our legal reporting requirements, it does represent an integral part of our site specific controls and the incident was taken very seriously.

The officer was suspended immediately upon discovery of the falsification. We reported this transgression to the NRPA. Disciplinary action resulted.

Raising awareness of radiation and maintaining appropriate perspective on the associated risks in the workplace remain important focal areas. We continued providing individualised training, tailor-made for each work area.

To render the workplace rules and regulations more accessible for our employees, we embarked on two initiatives:

- We developed a radiation safety calendar for the 2018 calendar year, which contains 26 fact sheets about radiation safety. The calendars were distributed to all employees.
- We developed an online radiation safety refresher training course. The online course will be implemented in 2018 and should supplement the teaching and awareness materials which are contained in the calendar.

To share information of our radiation protection programmes with the public, we post many of our reports, fact sheets and booklets on Rössing Uranium's website, under the 'Reports and Research' tab. Apart from the RMP and RMP implementation reports mentioned earlier, we share technical reports on environmental risk, as well as fact sheets and booklets on radiation protection in uranium mining.

Development of professional skills in radiation safety in the Erongo Region is important and continuously deliverable. In 2017 we again supported the Namibian Uranium Institute with the presentation of several courses to improve the skills of radiation safety officers and mining professionals. The ongoing training support also included an annual radiation safety refresher course for radiation safety officers.

## Raising awareness of radiation and maintaining appropriate perspective on the associated risks in the workplace remain important focal areas.

### **Epidemiology**

From 2011 onwards we began preparations for an epidemiological study on the potential effects of occupational radiation exposures on mine workers, designed to stand up to scientific scrutiny. The scoping for the study, which included an investigation on the available data and the study designs possible, was started in 2014 and concluded in 2015.

The study project was awarded to the Centre for Occupational and Environmental Health at the University of Manchester in the UK and the study kicked off in October 2015. The study design, chosen for best statistical power, was that of a case-cohort study, where a sub-group of the workers who have been diagnosed with specific cancers of interest (the cases) are compared with a larger subgroup of workers (the cohort).

We embarked on a media campaign to inform former workers about the study and to allow them to withdraw their consent for the use of their data, although all data was anonymised. We obtained ethics approval from the Ministry of Health and Social Services, from the University of Manchester and from the South African cancer registry, based on the study design submitted.

We appointed an external oversight committee, consisting of community leaders and Government representatives to provide external input and oversight. We also closely worked with the Namibian and South African cancer registries to identify as many cancer cases within our workforce as possible. The study design ensured that all information about cancer cases is anonymised before it was communicated to the research team, to ensure no personal information is conveyed.

In 2017 we completed the collection of human resources data and cancer data from the cancer registries and gathered the relevant occupational hygiene data for the past 40 years.

The statistical analysis of this information will be completed in 2018, with a final report expected towards the end of 2018. More information about the epidemiology study is available on Rössing Uranium's website, under the 'Reports and Research' tab.

## Process safety management

Process safety management (PSM) is a systematic approach of controlling the unwanted release of hazardous substances, process solutions or fires and explosions that have the potential to significantly impact the health and safety of employees, the environment or the business.

Rössing Uranium's PSM team forms part of the Rio Tinto process safety working group sub-committee, which is tasked with the development of training packages for the Rio Tinto Group. The Institute of Chemical Engineers (IChemE) provided training to the PSM team on the fundamentals of process safety management. This knowledge will be applied when implementing PSM standards and developing training packages for management and first-line leaders.

In 2017 the PSM team started an analysis of all process hazards. Chlorine gas was identified as one such hazard at the mine. A trial-run to substitute chlorine with calcium hypochlorite (which is in a granular format) was successfully completed during the second half of 2017 and the positive results will steer the mine to eliminate the chlorine gas hazard from site.

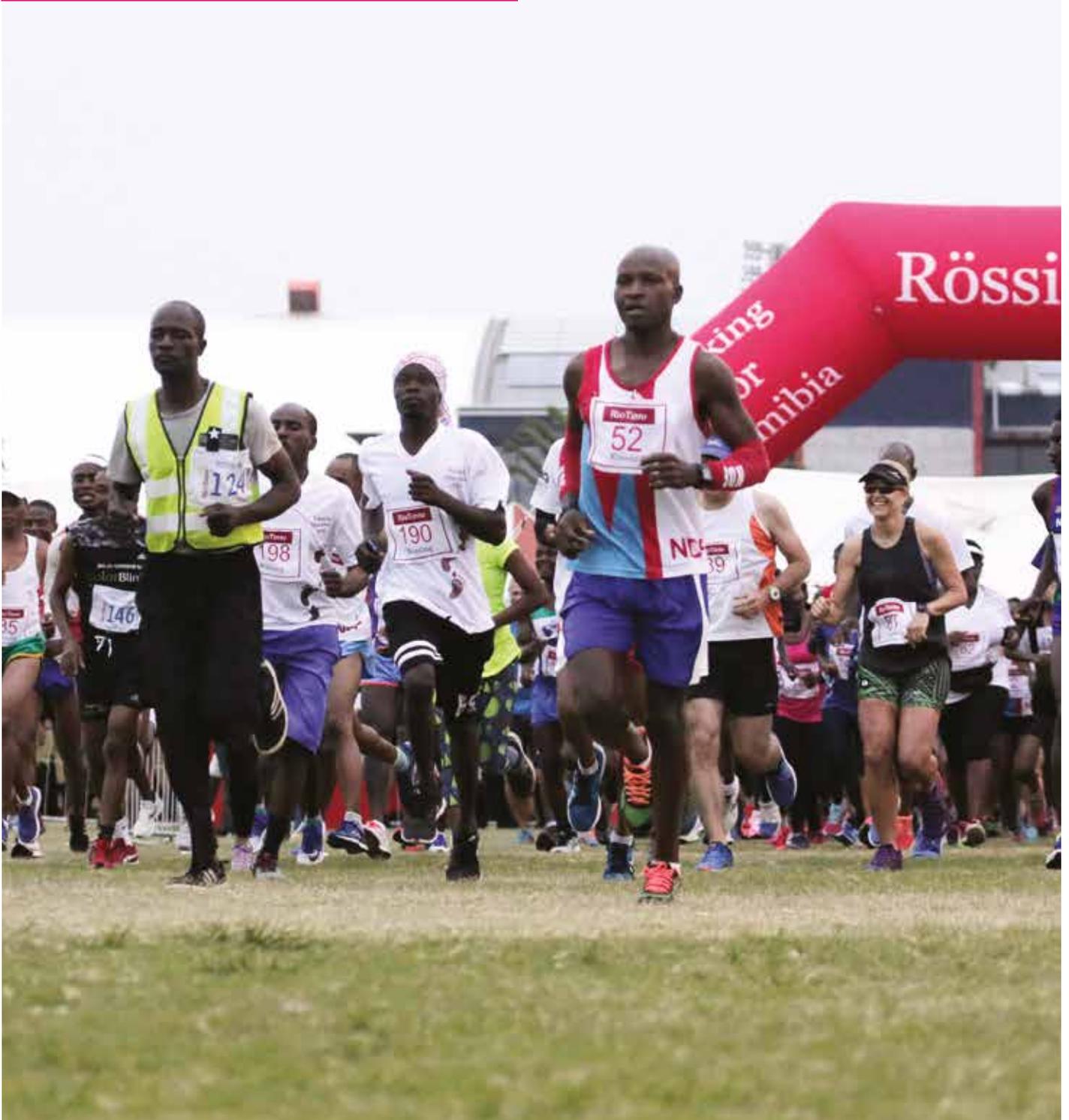
In collaboration with the asset management team, the PSM team also identified all critical process safety assets at the mine. The teams are formalising controls to manage these hazards.

Towards the end of 2017, Rössing Uranium had its first process safety audit with exceptional results, showing the commitment and progress being made towards making the mine a safer place by implementing process safety management controls.

In 2018 the focus will be on the accelerated deployment of the controlled-focused approach as being mandated by the Rio Tinto Energy and Minerals product group. The baseline assessment for both sulphuric acid and anhydrous ammonia was completed and is being managed.

A process safety engineer with a chemical engineering background and experience in a processing environment was appointed to assist with driving the process safety culture, to implement Rio Tinto's D6 Process Safety standard and to accelerate the deployment of the controlled-focused approach.

## Community relationships



The annual Rössing Marathon National Championship held in Swakopmund is a popular event on the Namibian athletics calendar.

## Community relationships



The Rössing Foundation provides library services to community members in the towns of Arandis, Ondangwa and Swakopmund. The purpose of the libraries is to ensure learners, teachers and community members have access to information through books.

Good community relations is as necessary for our business success as the effective management of our operations. This belief is at the heart of our overall approach with communities and is why we work hard to build good relationships with the people in our area of influence.

We strive to build enduring relationships based on open, respectful and trustworthy communication, which promote better understanding of our impact on the social and physical environment and ensure a significant contribution to Namibia's economic and social development.

We acknowledge that operating within a sustainable community provides our business distinct benefits, such as skilled and locally available employees; capable, local suppliers of goods and services; access to sustainably managed natural resources; and healthy and safe environments for our employees and their families.

With this in mind, we implement long-term community development plans that focus on improvements in quality of life. In 2017 we continued successful efforts to maintain these mutually-beneficial relationships.

### **Community relations**

Despite facing various production and market challenges during 2017, we remained steadfast in honouring our corporate social responsibilities. We accomplished this goal through continued investment in supporting sustainability of our neighbouring communities.

We align our community and social investment focus with the requirements of Namibia's Mining Charter. The charter, overseen

by the Chamber of Mines of Namibia, is aimed at positively and proactively addressing sustainable and broad-based economic and social transformation in the Namibian mining sector and is grounded in key Government policies such as Vision 2030, the Harambee Prosperity Plan 2016-2020 and the National Development Plan 5 (NDP5). Throughout 2017 we ensured accountability by tracking our compliance against the charter's targets.

During the year under review we committed a total of N\$12.5 million towards the implementation of community initiatives and activities. This is over and above the direct and indirect economic benefits we created through local employment and the procurement of goods and services from local businesses. We channelled most of our community and social investments through the Rössing Foundation, but also supported various community investment initiatives directly.

Because we pro-actively promote healthy, safe and environmentally responsible lifestyles amongst our stakeholders, we also made direct contributions to initiatives targeting:

- biodiversity protection through support of the annual bird-watching event;
- healthy living by way of the annual Rössing Marathon National Championship and family fun walk;
- awareness of personal health; and
- waste-management activities onsite.



Rössing assisted the Swakopmund Community Skills Development Centre (COSDEC) with much-needed knowledge through sponsoring an introductory training course, focusing on health, safety and environmental management.

We continue to provide support for other initiatives such as the Erongo House of Safety in Swakopmund through our partnership with the Erongo Development Foundation, the Swakopmund Museum, the West Coast Safety Initiative, as well as the Arandis Investment Conference and Uranium Festival, the most recent of which was held in November 2017.

We also coordinated a fundraising drive in support of the Kunene Regional Council (KRC), benefiting the Onkiye satellite school in the region. The Ondiye satellite school is part of a barren settlement area 150 km west of Opuwo. Many of the homes of the children who attend the school are situated kilometres away, forcing the learners to risk run-ins with wild animals and other strangers while they walk over long distances to attend class.

Following the request for assistance by the KRC to upgrade and build more facilities for the school and its learners, and as a result of our fundraising initiative, much needed funds were donated by one of our contractor companies, Uibasen Cleaning Services, which went towards funding the construction of more classrooms, dormitories and accommodation units for the teachers. The 'Namibia Project' of the United Kingdom also provided the school in one of Namibia's poorest regions with tracksuits, school uniforms, school shoes and cutlery and crockery for the 26 learners. The Rössing Foundation pledged books from their libraries.

We empowered 14 trainers from the Swakopmund Community Skills Development Centre (COSDEC) with much-needed knowledge through sponsoring an introductory training course, focusing on health, safety and environmental management. At the certificate hand-over event, Rössing's managing director, Werner Duvenhage, applauded the trainers for making time to attend such important training. He said: "I'm really impressed that the Rössing Uranium team is assisting our communities and that in turn, our partners are open to receiving our help, especially when it comes to safety training. It is really encouraging."

In addition to in-kind and financial contributions, we directed our employees' technical expertise to engage with the public and with community-based organisations to increase health, safety and environmental awareness within the Erongo Region. One such activity is radiation safety training, offered to the public in collaboration with the Namibian Uranium Institute. We also provided expertise to the Namibian Uranium Association on water-management issues to reduce the mining sector's footprint on regional water resources.

#### **Internal and external communication activities**

One of the key enablers in our business success is informing both our internal and external stakeholders about our operations. The Corporate Communication section use various platforms, initiatives and activities to establish, nurture and maintain good relationships and promote the sharing of information with our stakeholders.

# Community relationships

During 2017 various strategic communication activities were implemented to disseminate information about Rössing Uranium via a variety of channels in the print and electronic media, as well as by means of face-to-face communication.

We also kept the Namibian Government informed about our corporate business strategy. This was accomplished through the mine's senior management engaging politicians and senior officials on a number of matters of mutual interest. A number of stakeholder engagement events hosted during the year for the Namibia business community shared information about our business performance.

Our visitors' programme is a key means of engaging guests from around the world. Besides members of the public, the programme welcomes specialists, academics and Government officials. In 2017, we hosted 44 tours at the mine with a total of 844 visitors.

Media relations were facilitated through the management of various media enquiries and through invitations to a number of information-sharing events. The latter promoted the strengthening of our relationships with the media and facilitated balanced coverage of our operations and business activities.

Other communication activities involved a variety of external stakeholders.

We hosted the 17<sup>th</sup> annual Rio Tinto Rössing bird-watching event, which is part of the larger partnership between Rio Tinto and Birdlife International.

In line with our drive to promote healthy habits and support positive lifestyles in the community, we sponsored the 26<sup>th</sup> Rössing Marathon National Championship, while Swakop Striders Athletics Club hosted the event. The competitors participated in a marathon and a 10-km race, while a 5-km fun walk was held in support of the Cancer Association of Namibia. The marathon and 10-km race attracted approximately 400 athletes while 200 members of the public participated in the fun walk.

The cash and in-kind sponsorships and donations initiated through the Corporate Communications section totalled about N\$500,000 in 2017.

## The Rössing Foundation

The Rössing Foundation was established in 1978 through a Deed of Trust as a vehicle to oversee and implement many of Rössing Uranium's corporate social responsibility activities in Namibia.

The Rössing Foundation implements programmes and projects under the following mandates:

- To further the education of all Namibians in order to achieve greater national productivity and enhance lifelong learning.
- To encourage the creation and/or to create opportunities for people to use their education.
- To promote the advancement of the living standards of all the people in Namibia.
- To carry out any act or accomplish any thing, which in the opinion of the Trustees, shall benefit Namibia or any or all of its inhabitants.

In order to align programmes and projects, the Rössing Foundation focuses mainly on the following identified targets:

- the improvement of primary and secondary education through the implementation of various teachers' and learners' support programmes;
- the development of the local workforce and of specialised vocational skills through the provision of scholarships and part-time study opportunities to deserving Namibians;
- the diversification and strengthening of the local economy through support to small- and medium-scale enterprises; and
- working hand-in-hand with local authorities to strengthen their capacity and facilitate the development and implementation of their strategic plans.

### Education programme

The Rössing Foundation has been working in partnership with the Ministry of Education, Arts and Culture since Namibian independence in 1990. The partnership encompasses activities such as strengthening the capacity of teachers and learners, leadership and management programmes, resource sharing and exchanging expertise between the partners.

To address the education challenges facing Namibia the Rössing Foundation assists the Government of Namibia through the Ministry of Education, Arts and Culture by availing opportunities to teachers and learners to acquire subject-related knowledge for the development of competencies in English, Mathematics and the Sciences.

# Community relationships

To this end, the Rössing Foundation built and operates three state-of-the-art English, Mathematics and Science centres in the towns of Arandis and Swakopmund in the Erongo Region and in Ondangwa in the Oshana Region. In addition to these centres, the Rössing Foundation managed the English, Mathematics and Science mobile laboratory which travelled to many areas of the country during 2017.

This operation greatly benefited rural schools, as many teachers and learners cannot afford to travel to the centres. The centres and mobile laboratory will continue to serve as the hub of support programmes, not only for learners and teachers, but also for Namibian communities.

## **Teachers' support programmes**

Rössing Foundation regards support for teachers to be vital, as a single, well-equipped teacher is able to benefit up to 30 learners. Teachers' support programmes are conducted either at a centre or through the mobile unit on school visits to rural areas.

A total of 62 English language, one Mathematics and 11 Science teachers were supported at the three centres. In addition, the Rössing Foundation's Science Education Officer at the Ondangwa Centre, who served as chief judge at the annual Science Fair, trained 25 teachers to judge learners' Science projects fairly. Ten teachers from Swakopmund-based Hanganeni Primary School also visited the Tamariskia Centre to familiarise themselves with the centre's operations.

## **Learners' support programmes**

The Rössing Foundation's three education centres remain popular among learners. In addition to on-going support provided to learners from different schools in the English language, Mathematics and Science, many learners flocked to the Arandis and Tamariskia centres for examination preparations.

Learners who attended learning activities at Namibian College of Open Learning (NAMCOL), non-governmental organisations such as Mondesa Youth Opportunities, or privately-owned training institutions such as EDUBLOX and Africa Institutional Management Services (AIMS), also attended sessions regularly at the Rössing Foundation's centres.

The Rössing Foundation Ondangwa team carried out a special Mathematics session to support Okatana Secondary School in the Ohangwena Region during the school holiday period of May/June 2017.

During the year, vacation classes were conducted in all three centres to assist learners to consolidate what they had learned during the year.

In total, 4,147 junior primary learners benefited from the Rössing Foundation English, Mathematics and Science programmes during the year under review.

## **National mobile outreach programme**

During 2017 the mobile laboratory visited 21 schools in the Erongo, Kavango West, Omaheke, Oshana and Kunene Regions to support rural schools in English, Mathematics and Science subjects. A total of 12,788 learners, 455 teachers and ten education officers of the Ministry of Education, Art and Culture were supported through the programme. Each school received support for a full week.

A team of senior education officers from the Directorate of Education worked with the Rössing Foundation team and staff of the schools. The combined teams contributed greatly to the successful school support intervention in all the visited regions.

Learners are generally well-behaved, enthusiastic and willing to learn, while teachers continued to show enthusiasm and shared contact details with the visiting teams to enable continued support. School management teams played a vital role in ensuring that planned activities are carried out in the schools.

## **Library services to the community**

The main purpose of the Rössing Foundation's libraries is to ensure that learners, teachers and other community members have access to information through books. Improved reading skills are conducive to good results at school and deepen general knowledge as well.

The Rössing Foundation libraries are located in the vicinity of the communities they serve. Learners and other members of the communities of Arandis, Ondangwa and Swakopmund make use of the libraries on a daily basis.

Tamariskia recorded the highest learner attendance, while Arandis recorded the highest book circulations. At all three centres, between 6,500 and 6,750 learners visited the three libraries respectively. All libraries were utilised beyond capacity as learners occupied all available space in preparation for examinations.

In 2017 20,025 learners, 103 teachers and 8,602 community members visited the libraries in Arandis, Ondangwa and Swakopmund.



The Rössing Foundation's mobile laboratory which travelled to 21 rural schools during the reporting year, forms an important part of its education outreach programmes. In total, 12,788 learners, 455 teachers and ten education officers were supported through this programme during 2017.

### Enterprise development support

Four Rössing Foundation-supported enterprises had an opportunity to market their products and services during the Rössing Marathon held in Swakopmund. Afterwards they all indicated that the occasion was a good marketing platform, as the event was attended by many people from across Namibia.

In the first half of the year under review, the Rössing Foundation hosted a ceremony at the Arandis Town Hall to award certificates to eight Arandis residents who completed a Basic Business Skills training course and five who attended six or more sessions of the English Improvement programme.

The Foundation continued with the course during the second half of 2017 as both the Basic Business Skills and English courses are in demand among community members.

Three members of Úiba-Óas Crystal Market Cooperative, situated on the main road between Usakos and Karibib, received training from members of the Namibia Development Corporation and the Ministry of Industrialisation, Trade and SME Development in Karibib. The training focused on the use of the three value-addition machines (the tumbling, slicing and drilling machines). The training enabled the cooperative members to add value to raw stones, turning them into quality products, maximising their potential to turn a profit. Rössing Uranium donated personal protection equipment (PPE) to members for the use at the cutting and polishing centre to enhance safety.

The Rössing Foundation continued to work with project members of the community agribusiness, Dreamland Garden, to devise and implement a long-term solution for water supply to the project. Currently, the garden is using recycled water supplied by the Arandis Town Council to water the plants. After addressing water challenges, the project accelerated its production, enabling it to deliver over 100 bags of spinach per week to a local supermarket in Swakopmund and smaller amounts to local customers.

The Rössing Foundation supported the Ohungu Conservancy in the Dâures Constituency in northern Erongo since its inception in 2016. Following the approval of project funding by the Game Products Trust Fund, the community recruited workers to collect stones and sand to build three protection walls around the community's water points. The protection walls secured the community's water supply, which in the past was regularly compromised due to infrastructural damage caused by elephants roaming the area.

During 2017 the Rössing Foundation also facilitated a two-day workshop to help Khorixas Youth Construction (KYC) in developing project production and marketing plans for submission to the Social Security Commission-Development Fund (SSC-DF). Four members successfully completed a three-day practical course on brick making, machine handling and maintenance.

# Protecting the environment



## Protecting the environment



Above: Biodiversity advisor, Loide Hausiku, checks the condition of a *Euphorbia virosa* in the mining licence area of the mine with the Tailings Storage Facility in the background. Left: While it is not possible to extract mineral resources essential for modern life without impacting on the environment, we adjust the way we operate to reduce our impact on ecosystems and biodiversity as much as possible.

Rössing Uranium is committed to protecting the environment in which we operate. Measures include a wide range of preventative monitoring activities. We have a particular focus on water management and monitoring, especially in light of the extreme rainfall associated with the Erongo Region's water-scarce, hyper-arid climate. We have a strong history of engagement and co-operation with our regulators and other stakeholders to ensure that the environment remains protected.

We manage impacts on the environment with guidance from, among others, Namibian legislation, the ISO 14001 Environmental Management System, Rio Tinto's performance standards and international best practices. Through transparent reporting we provide our stakeholders with the assurance that our environmental impacts are monitored and the necessary mitigation measures are in place to keep our environmental impacts minimal.

Our environmental management performance, measured against set objectives and plans, is discussed below.

### Responsible water management

Water management at Rössing Uranium is guided by a formal water strategy and management plan, developed according to the Rio Tinto performance standard *Water quality protection and water management* and supported by Rio Tinto's *Water use and quality control* guidance notes.

The notes cover all activities related to water abstraction, dewatering, transport, storage, usage (potable and process) and treatment, and involves surface water (including run-off), impounded water and ground water. The intent of the standard is to ensure efficient, safe and sustainable use and protection of water resources and ecosystems.

In addition, Rössing Uranium adheres to all water-related aspects pertained in the Constitution of the Republic of Namibia. To that effect, we operate with a Waste Water and Effluent Disposal Exemption Permit 674 (valid until December 2020) and Water Abstraction Permit 10200 (valid until March 2019).

Knowing that our water requirements are substantial, our focus is on the sustainable and accountable use of this scarce and valuable resource, with minimal adverse effect on the environment.

We carry out various continuous monitoring, which include:

- taking frequent flow-meter readings at various points in the Processing Plant to provide a continuous overview of our water balance data;
- taking frequent water level measurements on our Tailings Storage Facility (TSF) and numerous monitoring locations across the mine site, extending to the Khan and Swakop Rivers; and
- conducting water-quality sampling at various locations (starting at the source, the TSF) which we use to understand changes in water chemistry due to chemical reactions in the heterogeneous environment.

# Protecting the environment

All spillages in the Processing Plant are captured and channelled to a large recycle sump for reuse. Effluents from the workshops are treated to remove oils and sewage is treated in the onsite Sewage Plant. These purified effluents are used in the open pit for dust suppression.

On the deposition pool (active paddy) of the TSF, water is recycled and reused on a continuous basis in the Processing Plant, minimising evaporation and infiltration into the tailings pile. Remaining water that has infiltrated is recovered by pumping boreholes and open trenches installed on the facility itself to reduce the volume of underground water within the tailings pile.

Seepage control systems are also employed outside the TSF. They include a surface seepage collection dam to capture water from the engineered tailings toe drains, cut-off trenches in sand-filled river channels, dewatering boreholes situated on geological faults and fracture systems on the downstream, western side of the facility. All systems are designed to lower the water table to the extent that flow towards the Khan River is interrupted. The recovered water is reused in the Processing Plant.

## Freshwater use

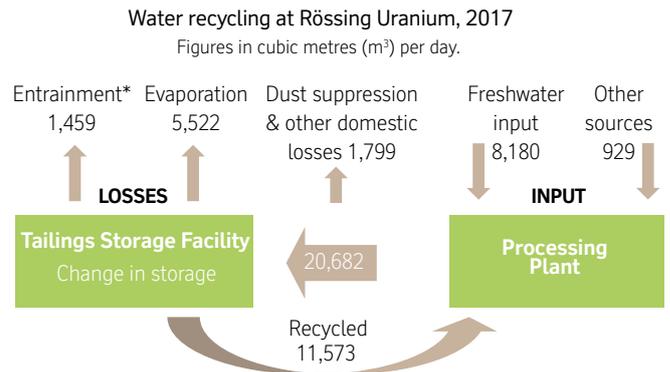
Our water demand is met by the local bulk water supplier, NamWater, via a pipeline from the marine desalination plant at Wlotzkasbaken. The supply of freshwater is an ongoing challenge for our operation due to the cost implications of desalinated water and the disruption in continuous supply.

The total freshwater usage target for 2017 was set at 2.85 million cubic metres (Mm<sup>3</sup>). The actual consumption of fresh water came to 2.99 Mm<sup>3</sup>, which is 4.9 per cent above the planned target. During most months in 2017, the actual monthly freshwater use was higher than planned, as indicated in Figure 13. This relates to the line graph in Figure 13 which shows the water consumption rate per tonne of ore milled. Against the set target of 0.3 cubic metres water per tonne of ore milled, the mine averaged 0.335 m<sup>3</sup>/t for 2017.

The large volume of freshwater consumption was primarily attributed to a higher water requirement per tonne of ore produced as indicated in Figure 14.

This is mostly due to the high calc content in the ore which requires more water during processing. The commissioning of the new deposition paddies, which influenced particularly the entrainment and evaporation losses, hindered our recycling efforts during the reporting year.

Figure 12: Overview of Rössing Uranium's water balance, 2017



\* Water entrainment is the permanent loss of water to the pore spaces of the tailings material and is not recoverable anymore.

Figure 13: Freshwater use per month, 2017

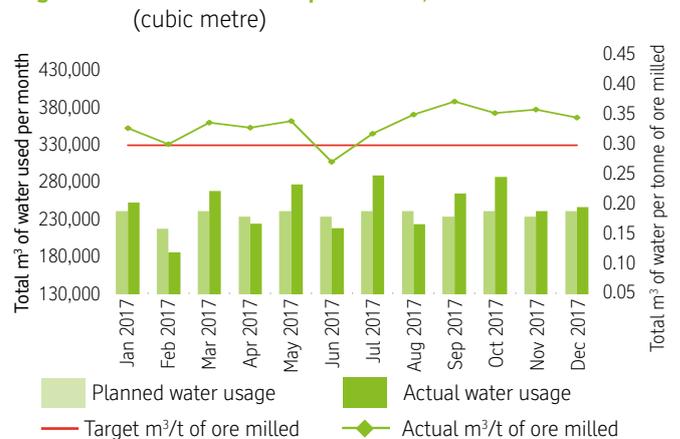
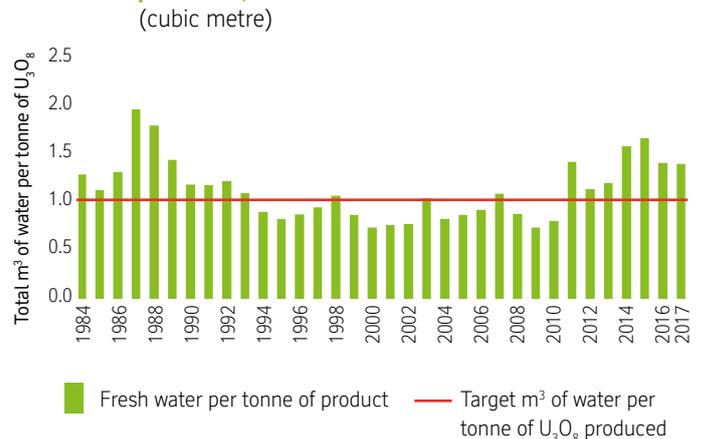


Figure 14: Volume of fresh water consumed per tonne of U<sub>3</sub>O<sub>8</sub> produced, 1984-2017





One of the newly-installed seepage recovery points in a tributary of the Khan River, consisting of a well (photo left) and a pump station (photo right). In 2017 we concluded a large scale, intense revision of our water-quality management programme with the outcome of a structural upgrade on the seepage recovery systems, which involved installation of fully automated, state-of-the-art telemetry systems, currently in construction and to be commissioned in early 2018.

### Water-quality management programme

Acknowledging our impacts and its inevitable influence on the environment, Rössing Uranium established a network of monitoring sites, which begins at the TSF, extending to the Khan and Swakop Rivers.

In 2017 we concluded a large-scale, intense revision of our water quality management programme. It was identified and deemed necessary to:

- upgrade the infrastructure for our seepage-recovery systems; and
- scrutinise the viability of our existing water-quality monitoring programme.

The structural upgrade on the seepage-recovery system, which involves installation of fully automated, state-of-the-art telemetry systems, is scheduled for commissioning in the beginning of 2018. The system is the last line of defence in a multi-layered seepage recovery mechanism and is designed to limit seepage from the TSF flowing towards the Khan River.

During 2017, and in conjunction with relevant stakeholders, Rössing Uranium evaluated the existing water-quality monitoring approach and came to the conclusion that improvements can be made to the routine sampling schedule (location, frequency and type of chemical analysis) and sampling methodology.

The increase in freshwater usage per month and per tonne of uranium oxide produced is mostly explained by the high calc content in the ore, which requires more water during processing.

# Protecting the environment

At the mine and the nearby town of Arandis a monitoring network is in place to quantify dust fallout and allow mitigation when necessary.

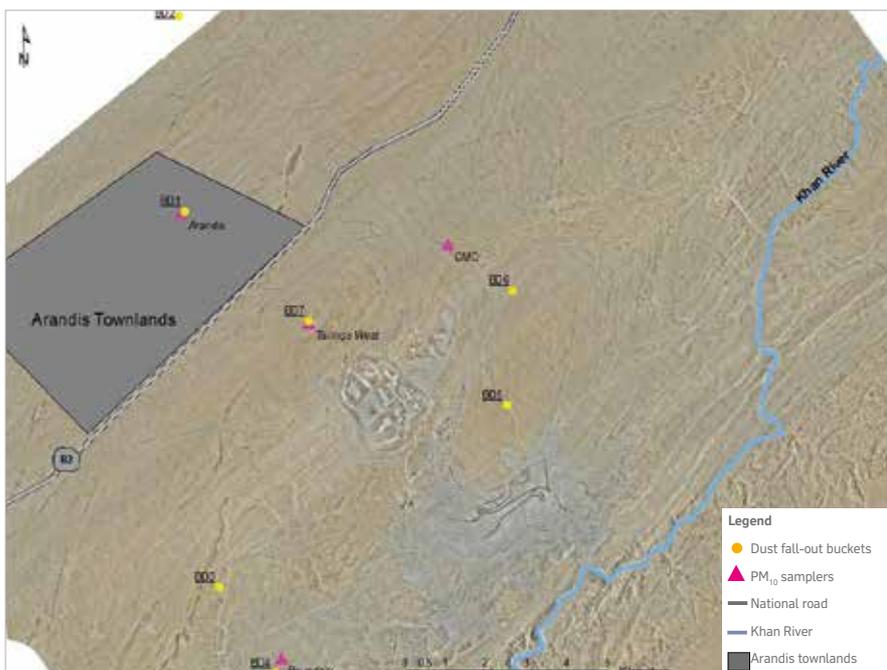
Based on a scientifically justified indicator of sulphate concentration greater than 3,000 ppm defining the seepage front, contours were drawn from the TSF incorporating the hydrogeological setting of the area. An adaptive (to seepage-front regression or progression) water-quality monitoring/sampling approach was discussed with the regulator and stakeholders towards the end of 2017 and will be finalised in 2018. All stakeholders will be involved in the process.

## Khan River water use

Saline water from the Khan River aquifer is used for the purpose of haul-road dust suppression in the open pit. A total of 104,755 m<sup>3</sup> of water was abstracted from the aquifer during 2017, which is 12 per cent of the permitted 870,000 m<sup>3</sup> per year.

Although we abstract a low portion of the permitted volume, we continue to monitor the vegetation and water levels in the Khan River to prevent over-abstraction, based on the ecosystem response.

In compliance with the abstraction permit conditions, annual reports derived from the water-level and vegetation-monitoring programmes are sent to the Ministry of Agriculture, Water and Forestry's Directorate Water Resources Management.



**Figure 15.** The map shows the PM<sub>10</sub> dust monitoring network samplers and dust fall-out buckets.

## Air-quality management

Air-quality management in mining refers to all the actions Rössing Uranium undertakes to help protect the environment from the harmful effects of air pollution caused by mining activities. Dust is generated during blasting, loading and dumping of ore and waste, as well as during crushing and conveying ore. Winds at speeds above 30 km/h potentially erode fine particles from rock dumps and the TSF and disperse them in the environment. In addition, noise and ground vibrations are created during blasting which is conducted when required, while the machinery deployed in the open pit and the Processing Plant generates noise continuously.

## Environmental dust

Dust emissions are of concern to residents of Arandis and Swakopmund as affected environments, especially when high-velocity winds occur during the winter months.

To quantify dust fallout and allow mitigation when necessary, a monitoring network is in place. We apply appropriate standards and regulations to assess monitoring results to ensure that the environmental dust is kept within the recommended limits.

Two types of dust are measured: firstly, a very fine inhalable dust invisible to the naked eye that is comprised of particulate matter less than 10 micron (known as PM<sub>10</sub>), and secondly, fallout dust, which is visible on the ground and comprised of larger particles, including PM<sub>10</sub>.

The measure of PM<sub>10</sub> is the weight of particles less than or equal to ten micrometres in diameter in one cubic metre of air. When inhaled, these tiny particles are not filtered out by the body and therefore reach the lungs.

We monitor PM<sub>10</sub> dust levels onsite at three dust monitor stations and at one station in the nearby town of Arandis (see Figure 15, denoted by pink triangles).

The levels measured in 2017 showed that PM<sub>10</sub> dust concentrations at all stations were below the adopted World Health Organisation standard of 0.075 mg/m<sup>3</sup>, except for one month, May 2017 (see Figure 16 on the next page).



Environmental advisor, Ann-August Shikongo, takes readings at the mine's dust monitoring station at Arandis.

The exceedance in May was at the western mine boundary. However, this case was not cause for concern as the WHO standard requires an annual average of 0.040 mg/m<sup>3</sup>.

Throughout the year, fallout dust is measured at six stations at different locations along the mine boundary (see the yellow dots on the map, Figure 15, on the previous page). The dust-fallout limit is 600 mg/m<sup>2</sup> per day with an annual average target of 300 mg/m<sup>2</sup> per day. Values measured during 2017 at the six stations ranged between 6 and 87 mg/m<sup>2</sup> per day with an annual average of 20 mg/m<sup>2</sup> per day (see Figure 17 below).

All measured deposition rates were well below the selected or adopted South African dust-control regulation.

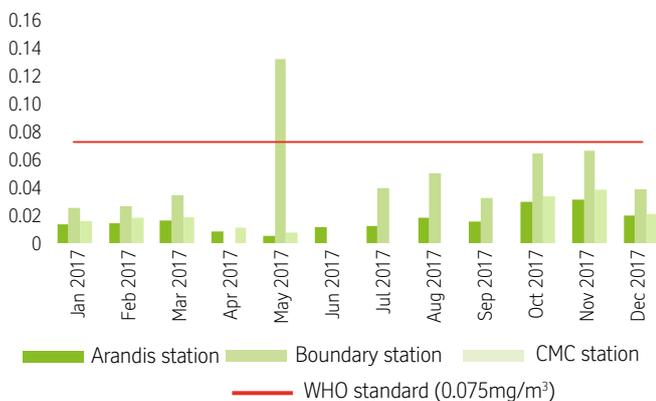
### Noise and vibration

Noise and vibration at Rössing Uranium are monitored through a network of various points and studies. The management of noise and vibration is guided by the Rio Tinto performance standard E6 (*Noise and vibration control*).

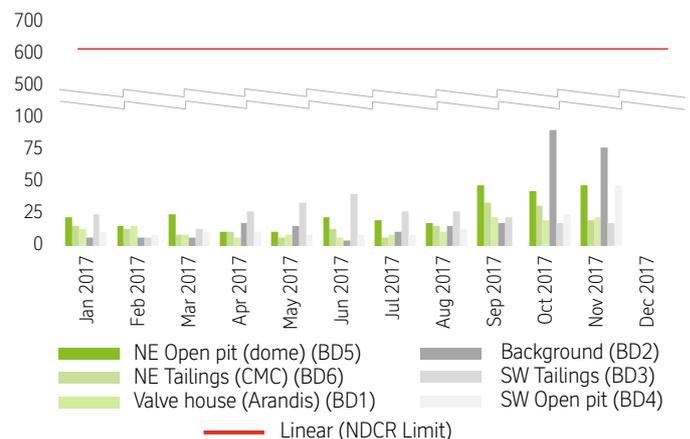
Environmental noise is monitored according to a specific procedure and reported on a monthly basis to minimise noise to threshold levels and identify events when these levels are exceeded.

Throughout 2017, both air-blast and ground vibration levels have been consistently below the limits of 134 dB and 12.5 mm/s respectively. Blasting is only carried out in the open pit approximately three times per month.

**Figure 16: Monthly average PM<sub>10</sub> dust concentration, 2017**  
(milligramme per cubic metre)



**Figure 17: Monthly average of daily dust deposition rates at the mine boundary, Jan-Dec 2017**  
(milligramme per square metre per day)

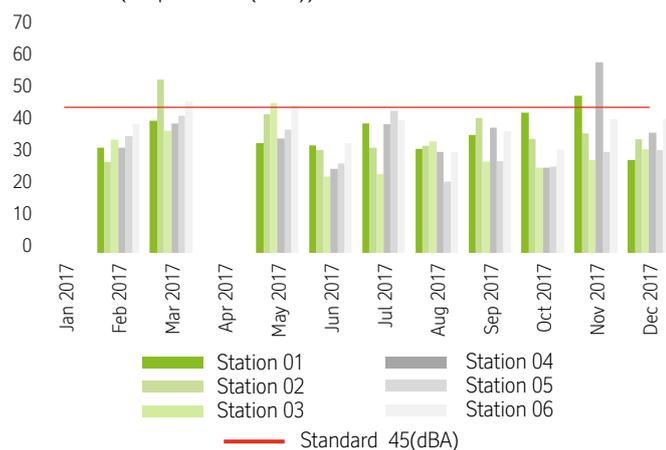


# Protecting the environment

Environmental noise is measured over snapshots of ten minutes. There were four events in 2017 during which noise levels, as recorded at the sampling points on the mine boundary, were above 45 dB(A) and, thus, exceeded the standard (Figure 18).

The events during which noise levels exceeded the standard are not ascribed to the operational activities at the mine, but are the result of natural sounds or passing vehicles in the immediate vicinity of the sampling points.

**Figure 18: Environmental noise over a period of 10 minutes, 2017**  
(Leq 10 min (dBA))



## Waste management

Mining operations are resource-intensive, consuming land, water, power, fuel, chemicals and construction materials to extract the metal held by the ore body. During the ore mining and metal refining processes, waste materials are produced which consist of mineral wastes in the form of rock and process tailings, and other waste products generated by the services that support the mining process.

## Mineral waste

During 2017 a total of 24.1 million tonnes of mineral waste were generated by the mine. This includes 9 million tonnes of tailings and 15.1 million tonnes of waste rock. A similar tonnage of waste was generated in 2016. The total cumulative mineral waste stored onsite at the end of December 2017 amounted to 955 million tonnes of waste rocks and 427.1 million tonnes of tailings.

Tailings were deposited on the existing TSF, mainly in the re-activated deposition areas that were prepared in 2015. The tailings footprint extended by 0.6 ha, or 0.1 per cent, into a partially disturbed

area immediately north of the facility. In total, 0.69 ha of land was disturbed, including 0.6 ha of tailings impoundment and 0.09 ha of a service track. The rock waste was deposited on top of the existing rock dumps close to the open pit without extending the footprint.

The total mineral waste inventory generated by Rössing Uranium over the past 41 years now consists of 1.38 billion tonnes. The mineral waste facilities cover a total area of 1.377 ha north-west of the Khan River. This reflects no change from 2016 as the storage facilities only gained in height but not in footprint. These facilities are about the same size as the town of Swakopmund, but are being managed in such a way that they are not visible to the nearby Arandis community, nor from the B2 highway.

## Non-mineral waste

Non-mineral waste materials include, for example, waste water, scrap materials, used oils and lubricants from maintenance activities, as well as substantial amounts of packaging materials such as containers and wooden pallets. The aim of managing waste at the mine is to ensure that the waste generated onsite is reused, recycled, recovered and disposed of in accordance with Rio Tinto standards, applicable laws, regulations and permit conditions.

The same waste management contractor that was appointed in June 2016 continued to handle recyclable materials such as scrap metal and packaging materials (including containers, paper and wooden pallets) onsite.

During 2017 in total of 1,747 tonnes of recyclable waste (mainly scrap metal and domestic waste) were removed offsite by the contractor.

These recyclable materials are sorted further by the contractor at the Swakopmund facility and dispatched to Windhoek for recycling and reuse at the contractor's refuse derived fuel plant. The non-recyclable materials are disposed of at the landfill site of the Municipality of Swakopmund.

The contaminated waste generated on the mine includes all waste from the Processing Plant area. In 2017 1,018 tonnes of contaminated solid wastes were disposed of on the TSF, while 34 tonnes of oil sludge soil was disposed at the bioremediation facility for treatment.

Hazardous waste generated onsite includes oils, greases, redundant chemicals and other items such as fluorescent tubes and batteries. A total of 62 tonnes of used oil were sent offsite for recycling. No hazardous waste materials were disposed of offsite during 2017.



Two bailer-machine operators of Rent-a-Drum, the waste management contractor appointed to handle recyclable materials such as scrap metal and packaging materials onsite, are compacting packaging material.

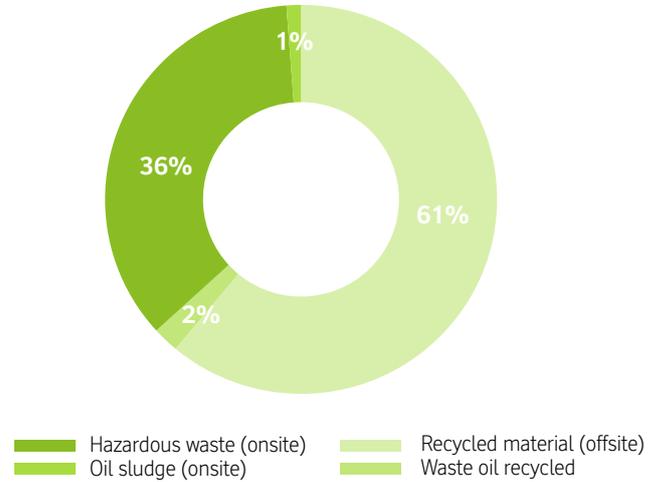
In total 204 tonnes of hazardous wastes, including contaminated hydrocarbons and redundant chemicals, are temporarily retained onsite. This arrangement is necessary due to the Rio Tinto performance standard that requires an offsite waste facility that handles our waste to be licenced. We are currently in collaboration with a few external HSE partners for possible future waste management projects.

### Energy efficiency and greenhouse gas emissions

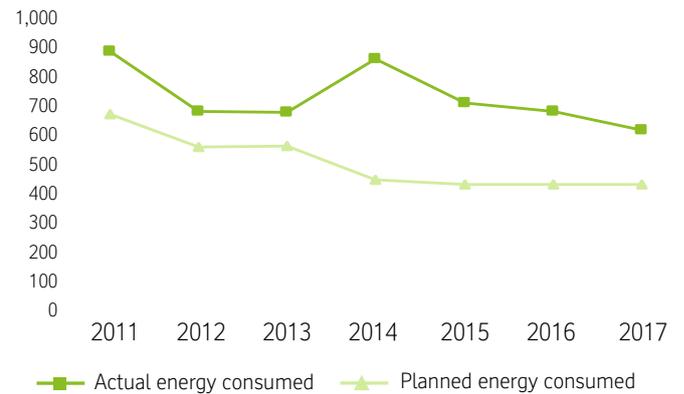
Rio Tinto strives to reduce greenhouse gas (GHG) emissions and improve energy efficiencies. This is done through measuring and managing energy intensity and emissions.

Sources of GHG emissions at Rössing Uranium include electricity and fuel consumption, the transportation of reagents and uranium oxide, blasting explosives, waste management areas (the sewage plant and landfill site), and the extraction and processing of ore. The intensity of emissions is reported per unit of uranium oxide produced.

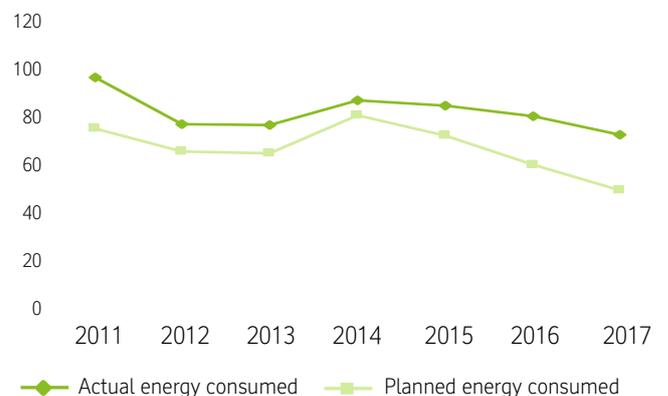
**Figure 19: Waste generated and disposed of, 2017**  
(percentage)



**Figure 20: Energy consumption, 2011-2017**  
(gigajoules per tonne of  $U_3O_8$  produced)



**Figure 21: Carbon dioxide emissions, 2011-2017**  
(tonnes of  $CO_2$  equivalent per tonne of  $U_3O_8$  produced)





A view of the mine's open pit which currently measures 3 km long by 1.5 km wide, and is 390 metres deep.

In 2017 the total energy consumption of the mine was 1.3 m GJ for 2,110 tonnes of uranium oxide drummed. This converts to an annual energy consumption of 616 GJ per tonne (GJ/t) of uranium oxide produced, which is 41 per cent above the projection target of 438 GJ per tonne uranium oxide produced.

This figure represents lower energy consumption when compared with the rate of the previous two years (see Figure 20 on the previous page) and was due to the improved ore grade mined.

Emissions of carbon dioxide (CO<sub>2</sub>) per unit of production in 2017 amounted to 74.2 tonnes of CO<sub>2</sub> equivalent per tonne (CO<sub>2</sub>-e/t) of uranium oxide, which is above the target of 52 tonnes CO<sub>2</sub>-e/t of uranium oxide for the year (see Figure 21 on the previous page).

### **Land-use management**

The disturbance of land is an inevitable consequence of any mining activity. It is our objective to keep expansions of the footprints of the open pit, the rock disposal areas and the tailings facility to a minimum.

This is achieved by following a strategy of preventing area extensions and instead developing the facilities to higher heights, avoiding impacts on plant and animal life, as well as on archaeological finds.

The total disturbed area calculated at the end of 2017 was 0.69 ha. The footprint of the TSF increased by 0.6 ha and about 0.09 ha service track contributed to the total land disturbed in 2017. To date our total foot print is 2,549.21 ha.



### **Closure planning**

Current mine plans foresee a cessation of production six years from now at the end of 2025.

The open pit will not be backfilled; it will remain a mining void into the future. The Tailings Storage Facility will be covered with waste rock to prevent dust emissions and rainwater erosion. Rössing Uranium will continue recovering tailings seepage, but instead of reusing it for mining processes, it will be allowed to evaporate.

The Processing Plant and the mine's infrastructure will be demolished. Recyclable materials will be decontaminated before selling them. Materials not leaving site will be disposed of safely and sufficiently covered so that they cannot cause harm.

To achieve these objectives and targets, Rössing Uranium developed implementation plans for mitigatory measures and calculated the associated closure costs. A detailed closure plan at pre-feasibility

level, containing more technical detail and higher cost-estimation accuracy than the current plan, will be developed in 2018 and 2019.

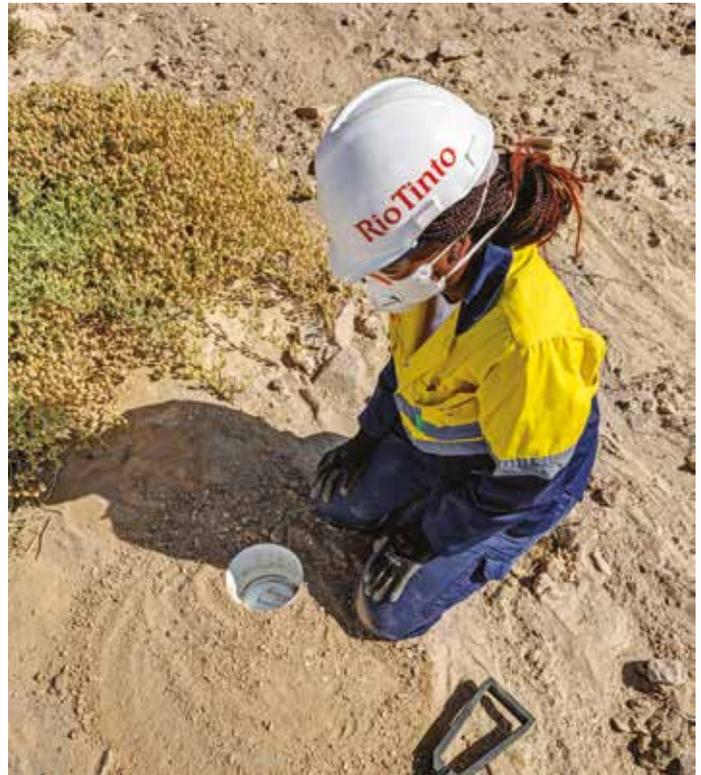
The establishment of the Rössing Environmental Rehabilitation Fund, which provides for expenditures associated with Rössing Uranium's closure, complies with statutory obligations and stipulated requirements of both the Ministry of Mines and Energy and the Ministry of Environment and Tourism.

Accordingly, the fund agreement states that each year the mining company will make a contribution to the fund to provide for the eventual closure of the mine.

At the end of December 2017 the fund had a cash balance of N\$718 million. In 2017 the total cost of closure, excluding retrenchment costs, was estimated at N\$1.58 billion. The mine will make additional payments to the fund each year to provide for the eventual total cost of closure by 2025.

# Biodiversity management

## Invertebrates monitoring at Rössing Uranium



Biodiversity advisor, Loide Hausiku, setting a pitfall trap to identify invertebrate species in the mine's wider landscape.

Rössing Uranium is committed to enhance biodiversity protection by assessing and considering ecological values and land-use aspects in investment, operational and closure activities.

One of the highlights of 2017 was the continuation of the invertebrate monitoring programme by means of a pitfall trapping method in the wider landscape. The focus was on the rocky hillside within our licence area that has not been sampled in the past.

The results indicated that 22 per cent of the species recorded in 2017 (48 out of 212) had not been found in the previous year and were first recorded on these sites in the reporting year. This shows that the increased sampling effort is being effective in recording the uncommon species.

In the past the invertebrate monitoring was carried out with the aim to collect information about the occurrence of 18 conservation-important invertebrate species, with a particular focus on discovering the four spiders only found to date within the rocky hill habitat by Dr John Irish, a leading Namibian ecologist, during a survey at Rössing Uranium in 1984.

The results revealed that none of the species under investigation were found in the traps. However, the study also revealed that there was no change in invertebrate biodiversity since 1984.

Invertebrate is a term used for animals without backbones; the word refers to insects, spiders, scorpions, worms and snails, among others.

Some invertebrates are generalists in habitat and thrive anywhere, while others are specialists occurring in limited habitats and sometimes even depend on a single plant species for their survival.

Invertebrates are the backbone of biodiversity, representing the majority of the world's animal species and play a critical role in the functioning of the ecosystem.

Though they are usually small, their ecological importance is immense. If we lost invertebrates, flowering plants would lose their pollinators, water would lose much of its filtration systems, the soil would lose its composters and earth turners, and the whole ecological system could collapse.

We monitor invertebrates to obtain and expand our knowledge about biodiversity in the Erongo Region. Monitoring of invertebrates improves our understanding of their abundance and diversity in the area we operate. This information can then be used to promote further research.

Monitoring reveals species of conservation value, enabling management strategies for these species to be developed. Monitoring information is vital in informing measures of landscape stability, ecosystem function and biodiversity.

Going forward, invertebrate monitoring will continue to focus on historically active, though now dormant areas to see how the natural environment re-established itself over long periods of time.

## Protecting the environment



We continued with the invertebrate-monitoring programme, enhancing our knowledge of biodiversity in the Erongo Region and improving our understanding of the abundance of invertebrates. This information can then be used for further, focused research.

Rössing Uranium is committed to enhance biodiversity protection by assessing and considering ecological values and land-use aspects in investment, operational and closure activities.

One of the highlights of 2017 was the continuation of the invertebrate-monitoring programme by means of a pitfall trapping method in the wider landscape. The focus was in the rocky hillside within our licence area that has not been sampled in the past.

# 22%

more invertebrate species were recorded in 2017 than in the previous year, indicating that the increased sampling effort is being effective in recording the uncommon species

We monitor invertebrates to obtain and enhance knowledge about biodiversity in the region. Monitoring information is vital for indicating measures of landscape stability, ecosystem function and biodiversity.

# Corporate governance at Rössing Uranium



At Rössing Uranium we conduct our business with integrity, honesty and fairness, building from a foundation of compliance with relevant laws, regulations and international standards, and are in line with various Rio Tinto and Rössing guidelines on leading business practices.

In line with our corporate values, Rössing Uranium is committed to the responsible stewardship of natural resources. We aim to be a leader in environmental stewardship and to maintain our reputation as a responsible corporate citizen. This aim can only be realised if we understand and appreciate the natural resources which are located in the areas in which we operate and if we use them in a manner that minimises the mine's impact, even after mining operations will have ceased.

## The Rio Tinto Integrity and compliance programme

Rössing Uranium has adopted the Rio Tinto Integrity and compliance programme. This programme ensures that the mine meets the Group's integrity and compliance commitment, as set out in *The way we work*, which dictates our work ethic and our global code of business conduct and applies to all our employees and contractors. *The way we work* outlines how we embody both our purpose and strategy. It clarifies how we should behave, in accordance with our values of safety, respect, integrity and excellence.

## The board of directors

The board of directors executes a mandate received from the shareholders. This mandate ensures that Rössing Uranium operates as a world-class, responsible company which has assembled an executive team to achieve specific targets. The board runs the company in accordance with the mandate outlined in Rössing Uranium's Articles of Association, ensuring that stakeholder interests are balanced and receive due attention.

Board of directors as at 31 December 2017	Role
F L Namene	Chairperson, independent non-executive director
W Duvenhage	Managing director (executive director)
S Kaufman	Rio Tinto plc shareholder representative; non-executive director
S J Ellinor (alternate to S Kaufman)	Rio Tinto plc shareholder representative; non-executive director
H P Louw	Independent non-executive director
E I Shivolo	Government of the Republic of Namibia's shareholder representative; non-executive director
C W H Nghamwa (alternate to E I Shivolo)	Government of the Republic of Namibia's shareholder representative; non-executive director
D S Kunji-Behari	Rio Tinto plc shareholder representative; non-executive director
L Dechambenoit (alternate to D S Kunji-Behari)	Rio Tinto plc shareholder representative; non-executive director

# Corporate governance at Rössing Uranium

Rössing Uranium has a unitary board and the roles of chairperson and managing director are separated and distinct. The board is comprised of members who possess a wide spectrum of skills, experience and diversity, which will best serve the interests of the company and its stakeholders.

The board held one special and four regular meetings during the year under review. The members of the board of directors are listed in the table on the previous page.

## Functions of the board

A board charter governs the functions of the board of directors, while the Nomination and Remuneration Committee monitors the board's performance.

The board adopts corporate strategy, plans of action and major policies, and monitors operational performance. Its duties include identifying risks to the company's sustainability, monitoring risk management and internal controls. It also oversees compliance management, corporate governance, business plans and key performance indicators which include non-financial criteria and annual budgets.

The board is also responsible for maintaining favourable and productive relationships with stakeholders. All directors bear full fiduciary responsibility and are obliged to exercise care in all company matters commensurate with their ability and skills. The board meets quarterly and otherwise when circumstances require.

## Board Audit and Risk Committee

The Board Audit and Risk Committee was established as a sub-committee of the board of directors and acts in accordance with an approved mandate under terms of reference, and assists the board to fulfil its oversight responsibilities relating to:

- the safeguarding of assets;
- the operation of adequate systems and control processes;
- the preparation of accurate financial reports and statements in compliance with applicable legal requirements and accounting standards;
- the preparation of accurate and reliable operational reports and statements in compliance with applicable legal requirements and operational standards;
- Rössing Uranium's compliance with relevant laws and regulations;
- Rössing Uranium's compliance with established policies and procedures; and
- the effective implementation and compliance with Rössing Uranium's risk-management process.

In performance of its duties, the Board Audit and Risk Committee maintains effective working relations with the board of directors, management, internal and external auditors and other assurance providers and is entitled to refer to the findings of experts, which shall include internal and external auditors.

## Nominations and Remunerations Committee

The Nomination and Remuneration Committee is appointed by the board of directors to assist in fulfilling its responsibility to the company's shareholders regarding the selection, nomination, performance, remuneration and succession of directors.

The Nomination and Remuneration Committee determines a remuneration structure for the board of directors and members of the sub-committees.

The remuneration rates are subjected to an annual review in February and any increases are submitted to the board of directors for presentation to the Annual General Meeting for shareholder approval.

The primary duties of the Nomination and Remuneration Committee are to:

- identify qualified individuals as potential members of the board of directors;
- make recommendations to the board relating to the nomination and selection of directors;
- review the findings of performance assessments of board members;
- ensure that appropriate procedures are used to assess the remuneration of the chairperson, vice chairperson, executive and non-executive directors, board committees and the board as a whole;
- review the policy for executive remuneration and for the remuneration and benefits of individual executive directors;
- review plans for the succession for board members; and
- review reporting disclosures related to Nomination and Remuneration Committee activities to ensure these disclosures meet the board's disclosure objectives and all relevant compliance requirements.

Functions of the committee will remain flexible so that it can react to changing conditions effectively and assure the board of directors and shareholders that the company can attract, remunerate and retain directors of the highest calibre.

# Corporate governance at Rössing Uranium

## Special-purpose vehicles

The company established two special-purpose vehicles, namely the Rössing Foundation and the Rössing Environmental Rehabilitation Fund, which are managed independently of Rössing Uranium by their own trustees. Members of Rössing Uranium's board are among these trustees.

Rössing Uranium established the Rössing Foundation in 1978 through a Deed of Trust to implement and facilitate its corporate social responsibility activities in communities of Namibia. The trustees of the Rössing Environmental Rehabilitation Fund review the closure plans and trust funds to make provision for eventual closure and rehabilitation of the mine site.

## The Corporate Governance Code for Namibia (NamCode)

Effective 1 January 2014, Rössing Uranium adopted the NamCode, which is the Corporate Governance Code for Namibia, based on international best practices and the King Code of Governance for South Africa, King III.

Rössing Uranium voluntarily adopts the principles of the code which is a prerequisite for all companies registered on the NSX (Namibian Stock Exchange) of which Rössing Uranium is not. In instances where we do not conform to the code, explanations have been provided, thereby adopting the 'apply or explain' principle as set out in the NamCode. Rössing Uranium's deviations from NamCode are listed in the table below.

Deviations from the NamCode	
<b>NamCode 16.1:</b> The chairman should be appointed by the board every year after carefully monitoring his independence and factors that may impair his independence.	<b>Rössing Uranium Articles of Association Art. 82:</b> The chairman is elected for a period determined by the directors. If no period is designated, the chairman shall hold office until otherwise determined by the directors.
<b>NamCode 16.10:</b> There should be a succession plan for the position of the chairman.	<b>Nomination and Remuneration Committee:</b> The appointment of deputy chairman was put on hold in 2016 and will be revisited in 2018.
<b>NamCode 18.12:</b> As a minimum two executive directors should be appointed to the board, the chief executive officer (CEO) and a director responsible for the finance function (CFO). This will ensure that there is more than one point of contact between the board and management.	In line with a board decision to reduce its size, the chief financial officer (CFO) is available at all meetings to answer questions and make presentations to the board.
<b>NamCode 18.17:</b> Independent non-executive directors may serve longer than nine years if, after an independence assessment by the board, there are no relationships of circumstances likely to affect, or appearing to affect, the director's judgement. A statement to this effect should be included in the integrated report.	<b>Rössing Uranium Board Charter:</b> The length of service which a non-executive director may serve is limited to three terms of three years each and a retirement age of 70 is prescribed with the directors' discretion to overrule if deemed fit.
<b>NamCode 26:</b> Companies should disclose the remuneration of each individual director and certain senior executives.	The remuneration of directors and senior management is disclosed to shareholders. Rössing Uranium does not propose to disclose this information to the public.
<b>NamCode 27:</b> Shareholders should approve the company's remuneration policy.	Remuneration is reviewed in detail by the <b>Nomination and Remuneration Committee</b> and approved in principle by shareholders.
<b>NamCode 18.7:</b> While the availability or otherwise of sufficiently experienced directors may be a challenge, shareholders should strive to constitute their boards with a majority of independent directors among their non-executive directors.	The board composition is currently not made up of a majority of independent directors due to a number of resignations received towards the end of 2017. The board composition is, however, still in accordance with <b>Rössing Uranium's Articles of Association</b> .

### **Financial statements**

The directors are responsible for monitoring and approving the financial statements to ensure that they fairly represent the company's affairs and its profits or losses at the end of each financial year. Independent auditors are responsible for expressing an opinion on the fairness with which these financial statements represent the company's financial position.

Rössing Uranium's management prepares the financial statements in accordance with the International Financial Reporting Standards (IFRS) and in a manner which the Namibian Companies Act (Namibian Companies Act (28) of 2004, amended 2011) requires. Independent auditors found the company's statements on appropriate accounting policies were applied consistently and supported by reasonable and prudent judgements and estimates.

### **Independence of external auditors**

The independent auditors, PricewaterhouseCoopers, audited Rössing Uranium's annual financial statements. The company believes that the auditors have observed the highest professional ethics and has no reason to suspect that the firm has not acted independently of the company. The Board Audit and Risk Committee has confirmed the independence of the external auditors for the reporting period.

### **Company secretary**

The company secretary, Glynis Labuschagne, is suitably qualified and has access to the company's resources to effectively execute her duties. She provides support and guidance to the board in matters relating to governance and compliance practices across the company. All directors have unrestricted access to the company secretary.

### **Risk report**

Risk management is a fundamental feature of the company's business activities. The company keeps risk management at the centre of its activities and cultivates a culture in which risk management is embedded in the daily management of the business.

The board acknowledges its overall responsibility in the process of risk management as well as responsibility to review its effectiveness.

Executive management is accountable to the board for designing, implementing and monitoring the process of risk management, as well as for integrating it with the company's day-to-day activities. To this end, the company has fully adopted and implemented the Rio Tinto Group risk policy and methodology.

### **Internal audit**

The company's internal audit function performs an independent appraisal activity with the full cooperation of the board and management. It has authority to independently determine the scope and extent of the business activity which is to be performed. Its objective is to assist executive management with the effective discharge of its responsibilities by examining and evaluating the company's activities, resultant business risks and systems of internal control.

The mandate of the internal audit function requires it to bring any significant control weaknesses to the attention of management and the Board Audit and Risk Committee for remedial action.

The internal audit function is outsourced to KPMG. The internal audit reports functionally to the company's Board Audit and Risk Committee and administratively to the company secretary.

### **Internal control**

Internal control comprises methods and procedures management implemented to ensure:

- compliance with policies, procedures, laws and regulations;
- authorisation, by implementing the appropriate review and approval procedures;
- reliability and accuracy of data and information (decision-making at Rössing Uranium needs to be grounded in accurate, timely, useful, reliable and relevant information);
- effectiveness and efficiency, which all operations at Rössing Uranium need to embody, using resources economically, while adding value to the economy. Rössing Uranium achieves this objective by continuously monitoring its goals and by embodying the credo, "that which is measured is controlled"; and
- safeguarding of assets, which need to be protected from theft, misuse or use for fraudulent or destructive purposes.

The directors are responsible for maintaining an adequate system of internal control. It is understood that such a system reduces, but cannot entirely eliminate, the possibility of fraud or error.

## Our value addition and summary annual financial statements



As a major employer and purchaser of goods and services, Rössing Uranium makes a significant contribution to the economic sustainability of communities and the creation of prosperity in the Erongo Region and the rest of the country..

# Our value addition and summary annual financial statements

The motivation to do value-added reporting is linked to the overall process of disclosure regarding financial information. By sharing information about the value Rössing Uranium adds through its operations and business activities, the mine aims to bring into focus all aspects of the impact the company makes on the economy of the region in which it operates, as well as on the country's economy as a whole.

Our value-added statement (page 61) reflects the wealth created through the sale of our uranium oxide production, payments for services to suppliers, taxes to the Namibian Government, payments to employees and the investments made in Namibian communities.

## How Rössing Uranium adds value

Sustainable development is underpinned by sustainable economies. Our continuing operations are based on our ability to secure access to land, people and capital. We use our economic, social, environmental and technical expertise to harness these resources and create prosperity for our stakeholders.

As a major employer and purchaser of goods and services, we make a significant annual contribution to economic development in the Erongo Region, in particular, and to Namibia at large. Rössing Uranium gives rise to a significant 'multiplier effect' — the phenomenon whereby spending by one company creates income for and further spending by others.

Given the prevailing market conditions, our primary focus was to procure goods and services as cost-effectively and efficiently as possible and to focus on maximising our contribution to the local economy.

Despite the current financial strain under which we operate, Rössing's total expenditure for goods and services for our operations was N\$2.3 billion during 2017.

As was the case during the previous reporting year, most of the N\$2.3 billion procurement expenditure was with Namibian-registered suppliers, amounting to N\$1.7 billion, accounting for 73.5 per cent of our total procurement expenditure. The primary local procurement expenditure was the procurement of sulphuric acid from Tsumeb-based Dundee Precious Metals.

We spent N\$331 million of total procurement with South African suppliers, representing 14.5 per cent of our procurement expenditure, while we spent N\$274 million with international suppliers, representing 11.9 per cent of our total expenditure.

Rössing Uranium remains committed to supporting local suppliers with the main focus on developing SMEs. The bulk of what we spend in Namibia remains in the Erongo (42 per cent) and Khomas (46 per cent) regions.

We invested N\$12.5 million in Namibian communities during 2017, either directly or through the Rössing Foundation.

The review period also saw us continue to demonstrate our value to Namibia through contributions to the fiscal authorities. Rössing Uranium paid the Government N\$77.8 million in royalty tax, and N\$118.3 million in pay-as-you-earn tax on behalf of employees. No corporate tax or dividends were paid in 2017 due to the company's position of having incurred a tax loss.

Payments to public enterprises, such as NamWater and NamPower, amounted to N\$425.0 million, which includes the Vocational and Education Training levy of N\$6.4 million paid to the Namibia Training Authority. We also spent N\$693.3 million in net salaries and wages.

## Preferential procurement and enterprise development

With the aim of securing economic growth, prosperity and the human dignity of all Namibians, the Government of Namibia developed the Harambee Prosperity Plan and the national, broad-based New Equitable Economic Empowerment Framework (NEEEF).

We remain committed to support Government development initiatives and policy frameworks. As such, we support local suppliers with the main focus on developing small- and medium-sized enterprises, equipping them with the necessary skills and knowledge to compete with international suppliers.

During the reporting period, we purchased N\$150 million worth of goods and services from previously disadvantaged Namibians and local small- and medium-sized enterprises.

# Our value addition and summary annual financial statements

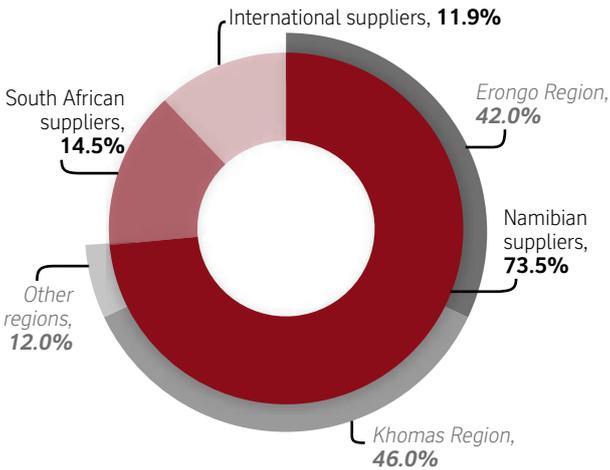
## Summary of Rössing Uranium's value addition

Our business provides a strong base for economic growth in communities located in the Erongo Region and in Namibia as a whole. Our economic contribution comprises the value we add by paying wages, employee benefits and Government taxes and

royalties, as well as by making dividend and interest payments, and by retaining capital to invest in the growth of the mine.

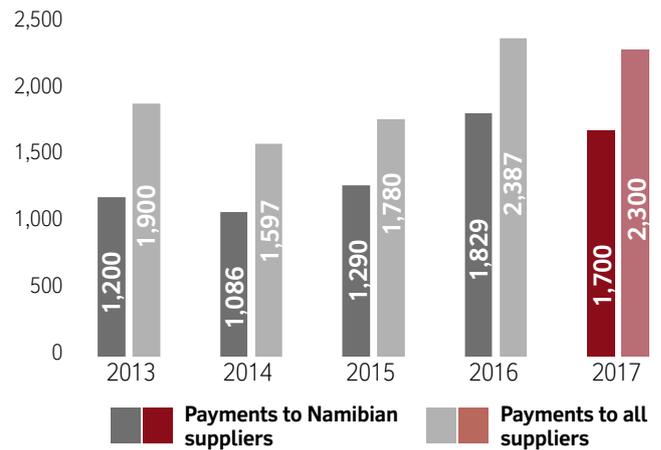
In addition, we make significant payments to our suppliers for goods and services, both locally and nationally. The graphs below highlight some of the key socioeconomic contributions we have made to Namibia over the past five years, 2013 to 2017.

### Distribution of Rössing Uranium's procurement expenditure, 2017



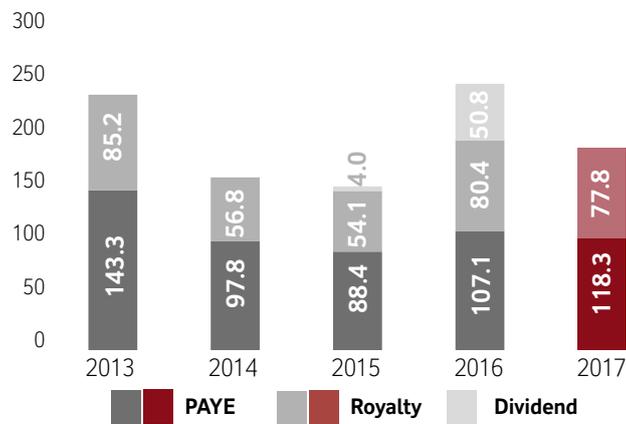
### Payments to suppliers, 2013 to 2017

(N\$ million)



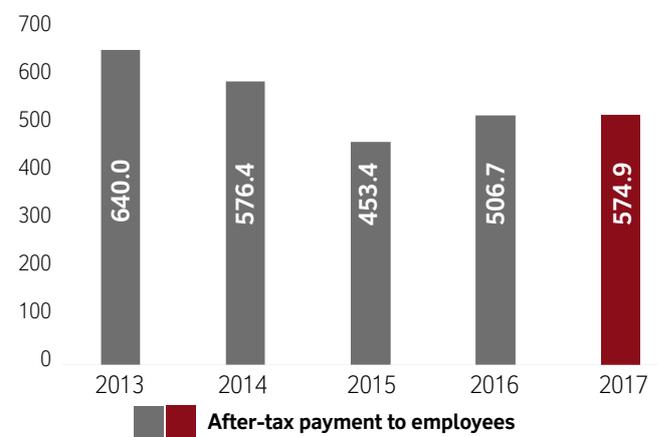
### Contribution to Government revenue, 2013 to 2017

(N\$ million)



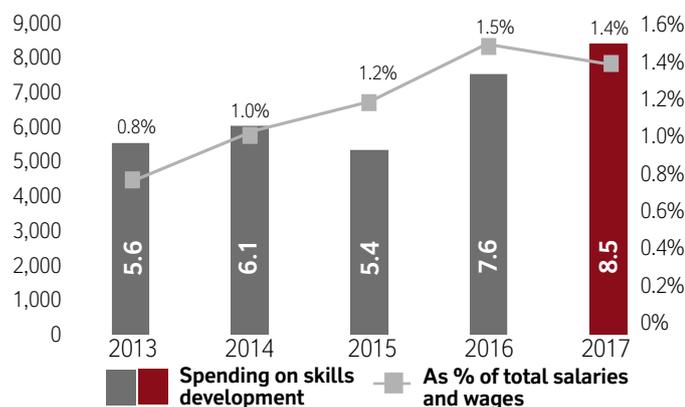
### After-tax payments to employees, 2013 to 2017

(N\$ million)



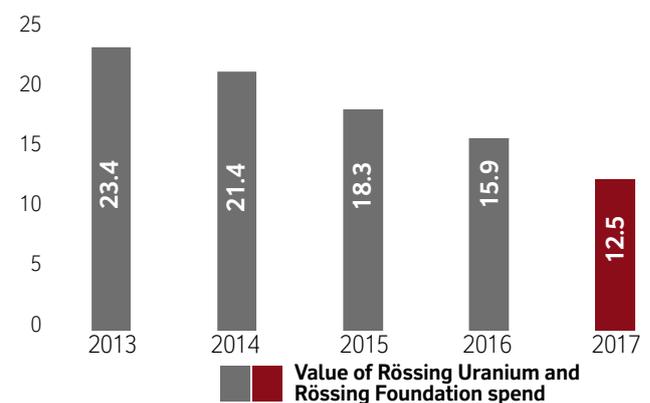
### Contribution to skills development (N\$ million), 2013 to 2017

(N\$ million)



### Contribution to Namibian communities (N\$ million), 2013 to 2017

(N\$ million)



## Our value addition

Stakeholders' Value Added Statement <sup>1</sup>	Notes	N\$'000 2017	N\$'000 2016	N\$'000 2015	N\$'000 2014	N\$'000 2013
<b>For the year ended</b>						
Turnover		2,695,803	3,070,853	1,841,012	2,405,747	2,969,440
Other income — sale of substitute concentrate		325,023	-	-	-	-
Less: Purchased material and services from non-stakeholders		1,714,177	1,830,175	1,347,984	1,597,397	1,894,295
<b>Total value added</b>		<b>1,306,649</b>	1,240,678	493,028	808,350	1,075,145
Investment income		61,903	46,050	39,361	38,735	22,733
Release of foreign denominated cash		-	1,487,750	-	-	-
<b>Total wealth created</b>		<b>1,368,552</b>	2,774,478	532,389	847,085	1,097,878
Employees	1	693,259	613,842	541,761	674,138	783,332
Providers of equity capital		-	1,436,906	111,798	-	-
Providers of loan capital		-	-	-	-	-
Government	2	502,874	523,900	371,891	414,288	394,774
The Rössing Foundation		12,000	12,000	12,000	1,394	
Reinvested in the Group	3	160,419	187,830	(505,061)	(242,735)	(80,228)
<b>Total wealth distributed</b>		<b>1,368,552</b>	2,774,478	532,389	847,085	1,097,878

<sup>1</sup> Stakeholders in this context: Shareholders, Government, lenders, employees and the Rössing Foundation

## Notes to the Stakeholders' Value Added Statement

1. Employees		693,259	613,842	541,761	674,138	783,332
- Net salaries and wages		574,911	506,684	453,379	576,379	640,039
- Pay-as-you-earn (PAYE) taxes		118,348	107,158	88,382	97,759	143,293
2. Government		502,874	523,900	371,891	414,288	394,774
- Dividend		-	50,844	3,956	-	-
- Erongo Regional Electricity Distributor		1,701	2,008	2,372	2,584	2,599
- Mining royalty tax		77,833	80,352	54,132	56,828	85,240
- NamWater		136,887	128,680	101,129	142,392	59,716
- NamPost		-	-	-	-	-
- NamPort		2,551	2,740	2,271	2,064	1,658
- NamPower		257,389	232,043	178,852	183,188	214,639
- Rates, taxes and licences		231	1,388	3,239	2,492	1,948
- Namibia Training Authority		6,432	5,594	5,013	4,756	-
- Receiver of Revenue		-	-	-	-	-
Current tax		-	-	-	-	-
- Road Fund Administration		1,454	1,383	1,349	1,229	1,084
- Telecom Namibia		2,853	4,375	2,683	3,843	4,671
- TransNamib		15,543	14,493	16,895	14,912	23,219
3. Reinvested in the Group		160,419	187,830	(505,061)	(242,735)	(80,228)
- Depreciation		418,004	333,697	279,842	262,876	228,627
- Retained earnings		1,949	107,099	(384,780)	(90,877)	31,586
- Deferred stripping capitalised		(114,501)	(282,538)	(227,591)	(340,564)	(355,305)
- Deferred tax		(145,033)	29,572	(172,532)	(74,170)	14,864

# Our value addition and summary annual financial statements

## SUMMARY ANNUAL FINANCIAL STATEMENTS

### COMPANY OPERATIONAL AND FINANCIAL REVIEW AS AT AND FOR THE YEAR ENDED 31 DECEMBER 2017

#### Financial performance

Revenue decreased by 12%, compared with the previous year, due to a lower, average portfolio sales price and a stronger local currency, despite sales volumes being in line with 2016. This had a negative impact and resulted in a net profit after tax of N\$2 million (2016: net profit after tax of N\$107 million) from normal operations. Further details of the company's financial performance are set out in the summary statement of comprehensive income.

#### Operations

Production of uranium oxide for the year was 2,110 metric tons compared with 1,850 metric tonnes in 2016. A total of 25,157,848 metric tonnes (2016: 24,428,455 metric tonnes) were mined from the open pit and 8,962,922 metric tonnes (2016: 9,194,439 metric tonnes) of ore were milled. The mine is currently operating on an approved life-of-mine plan to 2025 (2016: 2025). The additional available mineral resources have been written off following an economic re-assessment.

#### Dividends

No dividends were declared during the year (2016: N\$1,487,750,400).

#### Subsequent events

There were no subsequent events to report as at date of issue of the audited financial statements.

#### Auditors opinion

The summary results for the year ended 31 December 2017 have been audited by PricewaterhouseCoopers. The auditor's unqualified opinion is available for inspection at the company's registered office.

#### Directors

F L Namene (Chairman), W Duvenhage\* (Managing), S Kaufman\*\* (alternate S J Ellinor\*\*), D S Kunji-Behari\* (alternate L Dechambenoit\*\*\*\*), E I Shivolo (alternate C W H Nghaamwa), H P Louw\*.

\*South African \*\*Australian \*\*\* British \*\*\*\*French

#### Company secretary

G D Labuschagne  
P O Box 22391  
Windhoek

**SUMMARY ANNUAL FINANCIAL STATEMENTS (continued)**
**SUMMARY STATEMENT OF FINANCIAL POSITION AS AT 31 DECEMBER 2017**

	Notes	Audited 2017 N\$'000	Audited 2016 N\$'000
<b>ASSETS</b>			
<b>Non-current assets</b>			
Property, plant and equipment	6	26,944	3,463,209
Defined benefit pension asset		68,775	85,196
Rössing Environmental Rehabilitation Fund asset		718,050	603,482
<b>Current assets</b>		<b>2,407,798</b>	2,635,009
Inventories	7	619,387	560,360
Trade and other receivables		188,863	305,285
Rio Tinto Finance Ltd receivable		968,658	1,447,534
Cash and cash equivalents	8	293,503	57,642
Restricted cash	8	337,387	264,188
<b>Total assets</b>		<b>3,221,567</b>	6,786,896
<b>EQUITY AND LIABILITIES</b>			
<b>Equity</b>			
Share capital		223,020	223,020
Retained earnings		803,379	4,255,879
<b>Non-current liabilities</b>		<b>1,281,459</b>	1,340,614
Interest-bearing borrowings	9	-	9,832
Deferred tax liabilities		-	145,033
Provision for closure and restoration costs		1,266,100	1,170,437
Post-employment obligation		15,359	15,312
<b>Current liabilities</b>		<b>913,709</b>	967,383
Bank overdraft		-	34,385
Trade and other payables		913,709	931,885
Current portion of interest-bearing borrowings	9	-	1,113
<b>Total equity and liabilities</b>		<b>3,221,567</b>	6,786,896

**SUMMARY STATEMENT OF CHANGES IN EQUITY FOR THE YEAR ENDED 31 DECEMBER 2017**

	Share capital N\$'000	Retained Earnings N\$'000	Total N\$'000
<b>Balance at 1 January 2017</b>	223,020	4,255,879	4,478,899
Total comprehensive income and expenses	-	(3,452,500)	(3,452,500)
Dividends paid	-	-	-
<b>Balance at 31 December 2017</b>	<b>223,020</b>	<b>803,379</b>	<b>1,026,399</b>
<b>Balance at 1 January 2016</b>	223,020	5,837,949	6,060,969
Total comprehensive income and expenses	-	(94,320)	(94,320)
Dividends paid	-	(1,487,750)	(1,487,750)
<b>Balance at 31 December 2016</b>	<b>223,020</b>	<b>4,255,879</b>	<b>4,478,899</b>

# Our value addition and summary annual financial statements

## SUMMARY ANNUAL FINANCIAL STATEMENTS (continued)

### SUMMARY STATEMENT OF COMPREHENSIVE INCOME AND EXPENSES FOR THE YEAR ENDED 31 DECEMBER 2017

		Audited 2017 N\$'000	Audited 2016 N\$'000
<b>Continuing operations</b>	<b>Notes</b>		
Revenue		2,695,803	3,070,853
Other income		373,494	203,588
		<b>3,069,297</b>	3,274,441
Operating costs		<b>(2,688,225)</b>	(2,761,970)
Depreciation, amortisation and impairment charges		<b>(3,722,130)</b>	(333,697)
Other net (loss) / gains		<b>(146,728)</b>	(189,267)
Royalties-mining		<b>(77,833)</b>	(80,353)
<b>Operating (loss) / profit</b>		<b>(3,565,619)</b>	(90,846)
Finance income	4	61,903	46,050
Finance costs	4	<b>(96,818)</b>	(76,257)
<b>(Loss) / Profit before income tax</b>		<b>(3,600,534)</b>	(121,053)
Income tax	5	145,033	(29,572)
<b>Other comprehensive (loss) / income for the year</b>			
Actuarial gains on defined benefit pension asset		3,001	56,305
<b>Total comprehensive (loss) / income for the year attributable to equity holders of company</b>		<b>(3,452,500)</b>	(94,320)
<b>Reconciliation of total comprehensive income for the year to net profit/(loss) after tax from normal operations</b>			
<b>Total comprehensive (loss) / income for the year as above</b>		<b>(3,452,500)</b>	(94,320)
- Actuarial gains on defined benefit asset		<b>(3,001)</b>	(56,305)
- Forex loss / (gain) on Kalahari and Extract funds		<b>153,324</b>	257,724
- Impairment loss		<b>3,304,126</b>	-
Net profit/(loss) after tax from normal operations		<b>1,949</b>	107,099

### SUMMARY STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 31 DECEMBER 2017

<b>Cash flows from operating activities</b>			
Cash generated / (utilised) by operations		207,133	77,052
Interest received	4	10,717	8,557
Interest paid	4	<b>(20,740)</b>	(7,035)
<b>Net cash generated by operating activities</b>		<b>197,110</b>	78,574
<b>Cash flows from investing activities</b>			
Purchases of property, plant and equipment	6	<b>(116,524)</b>	(169,302)
Decrease in investment in Rio Tinto Finance Ltd.		<b>325,552</b>	1,492,947
Proceeds from sale of fixed assets		<b>22,553</b>	45,584
Contributions made to Rössing Environmental Rehabilitation Fund		<b>(63,382)</b>	(61,287)
<b>Net cash received from investing activities</b>		<b>168,199</b>	1,307,942
<b>Cash flows from financing activities</b>			
Dividends paid		-	(1,487,750)
Decrease in interest-bearing borrowings		<b>(10,945)</b>	(864)
<b>Net cash utilised by financing activities</b>		<b>(10,945)</b>	(1,488,614)
<b>Increase / (decrease) in cash and cash equivalents</b>		<b>354,364</b>	(102,098)
Cash and cash equivalents at beginning of year		<b>287,445</b>	312,957
Effects of exchange rate changes on cash and cash equivalents		<b>(10,919)</b>	76,586
<b>Cash and cash equivalents at end of year</b>	8	<b>630,890</b>	287,445

**SUMMARY ANNUAL FINANCIAL STATEMENTS (continued)****NOTES TO THE SUMMARY ANNUAL FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2017****1. Reporting Entity**

Rössing Uranium Limited is a company domiciled in the Republic of Namibia. These are the summary annual financial statements of the company as at and for the year ended 31 December 2017. The audited annual financial statements of the company as at and for the year ended 31 December 2017 are available upon request from the company's registered office.

**2. Statement of compliance**

These summary annual financial statements have been prepared in accordance with the framework concepts and the measurement and recognition requirements of IFRS and disclosure requirements of IAS 34, Interim Financial Reporting and the requirements of the company's Act of Namibia. They do not include all of the information required for full annual financial statements, and should be read in conjunction with the annual financial statements of the company as at and for the year ended 31 December 2017.

**3. Significant accounting policies**

The accounting policies applied by the company in these summary annual financial statements are the same as those applied by the company in its annual financial statements as at and for the year ended 31 December 2017. The accounting policies and methods of computation applied in the preparation of the summary consolidated financial report are consistent with those applied for the period ended 31 December 2016.

	<b>2017</b>	<b>2016</b>
	<b>N\$'000</b>	<b>N\$'000</b>
<b>4. Finance income and costs</b>		
Finance income - Rehabilitation fund	<b>51,186</b>	37,493
Interest income - Bank balances	<b>10,717</b>	8,557
Finance income	<b>61,903</b>	46,050
Interest expense - Bank borrowings	<b>(20,740)</b>	(5,767)
Interest expense - Finance lease liabilities	-	(1,268)
Provisions - unwinding of discount	<b>(76,078)</b>	(69,222)
Finance costs	<b>(96,818)</b>	(76,257)
<b>5. Taxation</b>		
Namibia - current taxation	-	-
Namibia - deferred taxation	<b>(145,033)</b>	29,572
	<b>(145,033)</b>	29,572
<b>6. Property, plant and equipment</b>		
Net book value at beginning of the year	<b>3,463,209</b>	3,310,150
Additions	<b>116,524</b>	169,302
Deferred stripping capitalised	<b>114,501</b>	282,538
Disposals	<b>(1,328)</b>	(1,350)
Depreciation charge	<b>(418,004)</b>	(333,697)
Impairment loss	<b>(3,267,543)</b>	-
Increase / (decrease) in closure provision	<b>19,585</b>	36,266
Net book value at end of the year	<b>26,944</b>	3,463,209
The continued decline in the uranium spot price, combined with the increasing exposure of the production to the spot market and a strengthening local currency against the US Dollar, sees the carrying value of property, plant and equipment unsupported by future cash flows and the asset's value in use. This resulted in an impairment loss amounting to N\$3,267,542 564 recognised in 2017 against the property, plant, equipment and intangible assets as well as a further N\$36,583,353 against long-term inventory (refer to Note 7). No impairment charge was incurred during 2016. The value-in-use was used as the recoverable amount for the cash generating unit, which comprise the business as a whole, to determine the impairment. The net present value of future cash flows was used to determine the value in use, which is estimated at a negative value of N\$1,485,600,000 (approximately US\$120 million at the year-end exchange rate of US\$/N\$12.38) using a discount rate of 7.7% and a closure discount rate of 2%.		
<b>7. Inventory</b>		
Inventory is stated after		
- Providing for obsolescence and impairment		
- raw materials obsolescence	<b>25,005</b>	22,316
- long term work-in-progress impairment	<b>36,583</b>	-

# Our value addition and summary annual financial statements

## SUMMARY ANNUAL FINANCIAL STATEMENTS (continued)

### NOTES TO THE SUMMARY ANNUAL FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2017 (continued)

#### 8. Cash and cash equivalents

Cash at bank and in hand	293,503	57,642
Bank overdraft	-	(34,385)
Restricted cash – Rio Tinto sales agreement guarantee (Note 12)	61,912	-
Restricted cash – Iran Foreign Investment Company	275,475	264,188
	<u>630,890</u>	<u>287,445</u>

The restricted cash relates to historic dividends that are payable to the Iran Foreign Investment Company shareholder. The transfer of the funds was restricted in terms of UN Security Council Resolution 1929. The board is actively investigating the potential payment of these dividends within the legal ambit of the remaining sanctions on the restriction. For the purpose of the statement of cash flows the year-end cash and cash equivalents comprise the above. The overdraft is unsecured. The company deposits cash surpluses only with major banks of high-quality credit standing.

#### 9. Interest bearing-borrowings

Non-current liabilities		
Capitalised finance lease agreements	-	9,832
Current liabilities		
Capitalised finance lease agreements	-	1,113
	<u>-</u>	<u>10,945</u>
Capital expenditure contracted but not yet incurred as at 31 December 2017	<u>9,719</u>	<u>70,433</u>

#### 10. Capital commitments

Capital expenditure contracted but not yet incurred as at 31 December 2017

#### 11. Unconditional purchase obligations

The company has entered into minimum off-take agreements with the suppliers of sulphuric acid for the next three years and HME tyres for the next year as well as commitments with regard to imports of manganese, sulphuric acid and grinding rods within one year. The total undiscounted amount at the year-end amounted to N\$680,571,315 (2016: N\$997,167,921). The company also entered into a new desalinated water off-take agreement with NamWater, which includes the commitment to off-take certain quantities of water for the next months. The total undiscounted amount at the year-end amounted to N\$73,648,317 (2016: N\$53,926,288).

#### 12. Guarantees

During 2016 the company entered into a new desalinated water off-take agreement with NamWater. The agreement includes the provision of a bank guarantee of N\$14,736,218 (2016: N\$14,736,218). The updated off-take agreement is valid until 25 October 2018. During the course of the year the company entered into an amended marketing arrangement with Rio Tinto Marketing Singapore Pte (RTU). The arrangement allows for more flexibility regarding the delivery on sales commitments through a margin scrape mechanism whereby RTU could be instructed to buy and sell material on behalf of the company and only remitting the margin scrape differential on the transaction to the company. In order to facilitate this arrangement, the company issued a financial guarantee to RTU of US\$5 million (value at year end: N\$61,911,838) in terms of the requirements of the amended agreement.

#### 13. Related parties

The company is controlled by Skeleton Coast Diamonds Limited which owns 68,6% of the company's issued shares. The remaining 31,4% of the shares are widely held and includes a 3.4% shareholding by the Government of Namibia. The ultimate holding company is Rio Tinto plc, a company registered in the United Kingdom.

Summary of related party transactions

Sales to Related Parties	2,544,973	2,922,659
Other income from Related Parties	325,023	-
Purchase of Product and Services	209,216	322,235
Receivables from Related Parties	1,004,696	1,553,889
Payables to Related Parties	91,609	66,881
Transactions with Government, state-owned and semi-state-owned enterprises	502,874	523,900

#### 14. Fair Value of Financial Instruments

At 31 December 2017, the carrying amounts of cash and short-term deposits, trade accounts receivable, trade accounts payable, accrued expenses and current interest-bearing borrowings approximated fair values due to the short-term maturities of these assets and liabilities. The carrying value of non-current interest-bearing borrowings approximates fair value due to the fact that the underlying interest rate is linked to the prevailing market interest rates. All financial instruments are categorised as level 3. Settlement costs are expected to be immaterial.



# Performance data table

	2017	2016	2015	2014	2013
<b>Employees</b>					
Number of employees	<b>956</b>	949	948	850	1,141
<b>Production</b>					
Uranium oxide produced (tonnes)	<b>2,110</b>	1,850	1,245	1,543	2,409
Ore milled ('000 tonnes)	<b>9,000</b>	9,194	6,876	7,040	10,076
Waste rock removed ('000 tonnes)	<b>15,110</b>	16,467	12,471	16,225	24,448
Ratio of ore milled to waste rock removed	<b>0.63</b>	0.56	0.55	0.43	0.41
<b>Health, safety and environment</b>					
New cases of pneumoconiosis	<b>0</b>	0	0	0	0
New cases of dermatitis	<b>0</b>	0	0	1	2
New cases of hearing loss	<b>1</b>	0	0	1	0
New cases of chronic bronchitis	<b>0</b>	0	0	0	0
All-injury Frequency Rate (AIFR)	<b>0.39</b>	0.82	0.74	0.81	0.96
Number of Lost-day injuries	<b>3</b>	5	7	8	13
Source dust levels at Fine Crushing Plant (mg/m <sup>3</sup> )	<b>2.37</b>	1.81	1.25	2.03	2.95
Freshwater consumption ('000 m <sup>3</sup> )	<b>2,998</b>	2,654	2,103	2,436	2,914
Freshwater usage per tonne of ore milled (m <sup>3</sup> /t)	<b>0.33</b>	0.29	0.30	0.35	0.29
Ratio of fresh water:total water	<b>0.40</b>	0.38	0.36	0.43	0.41
Seepage water collected ('000 m <sup>3</sup> )	<b>2,083</b>	2,407	2,206	1,848	2,060
Energy use onsite (GJ x 1,000)	<b>1,321</b>	2,528	1,777	1,108	1,007
Energy use per tonne of ore processed (MJ/t)	<b>147.46</b>	137.03	129.25	148.88	174.79
CO <sub>2</sub> total emission (kt CO <sub>2</sub> equivalent)	<b>157.44</b>	150.06	106.87	118.31	187.82
CO <sub>2</sub> equivalent emission per tonne of production (e/t uranium oxide)	<b>74.20</b>	81.81	85.87	82.00	78.04
<b>Product and customers</b>					
Uranium spot market price (US\$/lb) (average)	<b>22.16</b>	25.64	36.55	33.17	38.17

# Rössing Uranium's production of uranium oxide and the nuclear fuel cycle

Uranium is a relatively common element that is found in the earth all over the world, mined in many countries and processed into yellow cake, that is, uranium oxide ( $U_3O_8$ ). Uranium oxide has to be processed before it can be used as a fuel for a nuclear reactor, that is, where electricity is generated to produce heat and steam in order to drive a turbine connected to a generator.

## Rössing Uranium's operations



### 1. Drilling and blasting

Through drilling, blasting, loading and hauling, the uranium ore at Rössing Uranium is mined. Due to the erratic distribution of minerals in the ground, waste and ore are often mixed. Radiometric scanners measure the radioactivity level of each truckload, determining whether the material is sent to the primary crushers or to the stockpiles. Waste is transported to a separate storage area.



### 2. Crushing

Ore is delivered to the Primary crushers by haul trucks and then taken by conveyor to the coarse ore stockpile. It passes through a further series of crushers and screens until the particles are smaller than 19 mm. After weighing, the fine ore is stored.



### 3. Grinding

Wet grinding of the crushed ore by means of steel rods reduces it further to slurry with the consistency of mud. The four rod mills, which are 4.3 m in diameter, are utilised as required by production levels and operate in parallel.



### 4. Leaching

A combined leaching and oxidation process takes place in large mechanically agitated tanks. The uranium content of the pulped ore is oxidised by ferric sulphate and dissolved in a sulphuric acid solution.



### 5. Slime separation

The product of leaching is a pulp containing suspended sand and slime. Cyclones separate these components and, after washing in roto scoops to remove traces of uranium-bearing solution, the sand is transported via a sand conveyor to the Tailings Storage Facility.



### 6. Thickening

Counter-current decantation thickeners wash the slimes from previous stages. A clear uranium-bearing solution ('pregnant' solution) overflows from the thickeners, while the washed slime is mixed with the sands and pumped to the tailings area.



### 7. Continuous ion exchange

The clear 'pregnant' solution now comes into contact with beads of specially formulated resin. Uranium ions are adsorbed onto the resin and are preferentially extracted from the solution. Beads are removed periodically to elution columns. There the acid wash removes the uranium from the beads. The resulting eluate is a purified and more concentrated uranium solution.



### 8. Solvent extraction

The acidic eluate from the ion exchange plant is mixed with an organic solvent which takes up the uranium-bearing component. In a second stage, the organic solution is mixed with a neutral aqueous ammonium sulphate solution which takes up the uranium-rich 'OK liquor'. The acidic 'barren aqueous' solution is returned to the elution columns.



### 9. Precipitation

The addition of gaseous ammonia to the 'OK liquor' raises the solution pH, resulting in precipitation of ammonium diuranate, which is then thickened to a yellow slurry.



### 10. Filtration

The ammonium diuranate is recovered on rotating drum filters as yellow paste, known as 'yellow cake'.



### 11. Drying and roasting

Final roasting drives off the ammonia, leaving uranium oxide. The final product is then deposited in metal drums. Neither ammonium diuranate nor uranium oxide are explosive substances.



### 12. Loading and dispatch

The drums of uranium oxide are dispatched and exported to overseas converters for further processing. At full capacity, the Processing Plant can produce 4,500 tonnes of uranium oxide each year. **This step completes the Rössing Uranium production process.**

## Our customers' operations



### 13. Conversion

The uranium oxide is converted to uranium hexafluoride crystals. Conversion plants operate commercially in Canada, China, France, the UK, and the US. \*



### 14. Enrichment

This step increases the concentration of the isotope uranium-235 ( $^{235}U$ ) from its naturally occurring level of 0.7 per cent to higher levels required for nuclear reactors — about 3 per cent. \*



### 15. Fabrication

Enriched uranium is converted into uranium dioxide, formed into solid cylindrical pellets, sealed in metal fuel rods, and bundled into fuel assemblies. \*



### 16. Power generation

Fuel assemblies are loaded into nuclear reactors where the  $^{235}U$  fissions, producing heat and steam used to generate electricity. (\*Photos: www.aveva.com)



## Rössing Uranium Limited

Registered in Namibia No. 70/1591

### Please contact us for any feedback, comments, concerns, suggestions or complaints about Rössing's operations.

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