CNNC Rössing Uranium
Working for Namibia

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2020

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Acronyms and Abbreviations

µm	micrometre, 10^{-6} m
dB	decibel
cm	centimetre
CO	carbon monoxide
CO_2-e	carbon dioxide equivalent
CSIR	Council for Scientific and Industrial Research
DWA	Department of Water Affairs
EMS	Environmental Management System
FPR	Final Product Recovery plant
GHG	greenhouse gas
GIS	Geographic Information Systems
GJ	gigajoule
GJ/kt	gigajoules per kilotonne
HSE	health, safety and environment
HSE MS	Health, safety and environment management system
IUCN	International Union for Conservation of Nature
km	kilometre
L	litre
m	metre
M	mega, one million
m^3	cubic metre
mamsl	metres above mean sea level
MAWLR	Ministry of Agriculture, Water and Land Reform
mg	milligram
mg/kg	milligram per kilogram
mg/L	milligrams per litre
mg/m^3	milligram per cubic metre
mg/m^2	milligram per square metre
ML 28	Rössing Uranium Limited's Mining Licence 28
m/s	metre per second
m^3/s	cubic metres per second
MSDS	material safety data sheets
m^3/t	cubic metre per tonne
NO_x	nitrogen oxide
PM_{10}	particulate matter smaller than 10 microns in diameter
ppm	parts per million
SANS	South African National Standards
SO_2	sulphur oxide
SOP	standard operation procedure
TPH	total petroleum hydrocarbon
TPM	total particulate monitors
TSF	Tailings Storage Facility
UN	United Nations
UNSCR	United Nations Security Council Resolution
U_3O_8	uranium oxide
yellowcake	ammonium diuranate

1. Introduction

1.1 Location

Rössing Uranium Limited mines a large-scale, low-grade uranium ore body in the Namib Desert, in the sparsely populated Erongo Region of Namibia (Figure 1).

The mine is located 12 km from the town of Arandis, which lies 70 km inland from the coastal town of Swakopmund. 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^2, of which 25 km^2 is used for mining, waste disposal and processing. Rössing mine is situated about 25 km upstream of the Khan/Swakop rivers confluence.

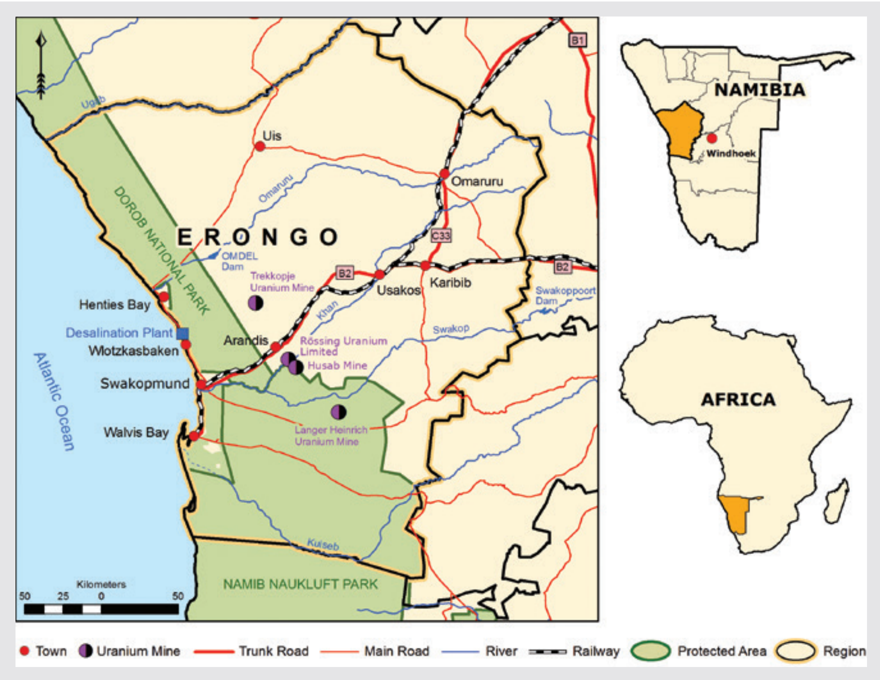


Figure 1: Location of Rössing mine.

1.2 Shareholding

China National Nuclear Corporation Limited (CNNC) is the majority shareholder in Rössing Uranium Limited, holding 68.6 per cent of the shares.

The Namibian Government has a 3 per cent shareholding, with a majority (51 per cent) when it comes to voting on issues of national interest.

The Industrial Development Corporation of South Africa owns 10 per cent, while individual shareholders own a combined 3 per cent shareholding. The Iranian Foreign Investment Company owns 15 per cent, a stake that was acquired during the set-up of the company in the early 1970s.

In 2020, the production of uranium oxide for the year was 2,489 tonnes compared to 4,449 metric tonnes in 2019. A total of 19.4 million metric tonnes (2019: 22.4 million metric tonnes) were mined from the open pit, and 8.7 million metric tonnes (2019: 8 million metric tonnes) of ore were milled.

1.3 Scale of operation

Rössing is the world's longest-running, open-pit uranium mine. It is a 24-hour, 365-days-a-year operation. Rössing is among the two Namibian uranium mines in operation which provide a considerable amount of the world uranium oxide mining output.

1.4 Current life-of-mine

The life-of-mine plan currently is ending in 2025, however, there are support studies underway to inform the feasibility of extending that to 2035.

2. Brief description of the environment

2.1 Geology

The Rössing uranium deposit lies within the central part of the late-Precambrian Damara orogenic belt that occupies an area approximately 50 km wide and extends northeast for over 100 km in west-central Namibia. The Damara lithology consists mainly of folded, steeply dipping meta-sediments (gneiss, schist, quartzite, and marble) arranged in a northeast-southwest striking belt.

The geology of the mining area at Rössing is associated with a dome structure and occurs in pegmatitic granite known as alaskite, which intruded into meta-sediments. The Rössing ore body is unique in that it is the largest known deposit of uranium occurring in granite. The nature and grade of uranium ore is extremely variable and can be present as large masses or narrow inter-bands within the barren meta-sediments.

All the primary uranium mineralisation and most of the secondary uranium mineralisation occurs within the alaskite. However, the alaskite is not uniformly uriniferous, and much of it is un-mineralised or of sub-economic grade.

Uraninite is the dominant ore mineral (55 per cent); secondary uranium minerals constitute 40 per cent, while the refractory mineral betafite makes up the remaining 5 per cent. Ore grades at the mine are very low, averaging 0.035 per cent. The uranium ore consists of 70-90 per cent alaskite and is subdivided into four ore types, according to the composition of the host rock.

2.2 Climate

Rössing is situated in an arid area and receives very low annual precipitation. In 2020, the total annual rainfall received on the mine was 1.3 mm. The annual rainfall, and the long-term rainfall average, is displayed in Figure 2.

Rössing rainfall measurements indicate an average annual rainfall of about 30 mm over the years.

In terms of temperature, the variation between daily minimum and maximum temperatures are wide. The lowest temperatures are recorded during August and the highest temperatures are recorded in December, as shown in Figure 3. The coldest months usually begin in April and continue to July before temperatures start picking up again during summer.

In 2020, at Rössing the predominant winds experienced were blowing from a west-southwestly direction.

The combination of low rainfall, high temperatures, wide temperature ranges and prevalent winds result in high evaporation rates that vary between 6 and 15 mm per day. The potential evaporation is thus around 3,000 mm per annum.

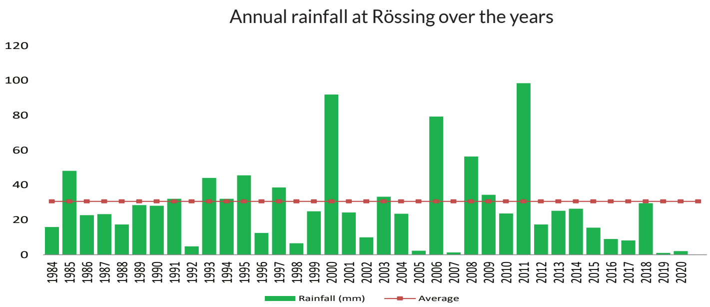


Figure 2. Variation in annual rainfall at Rössing, 1984-2020

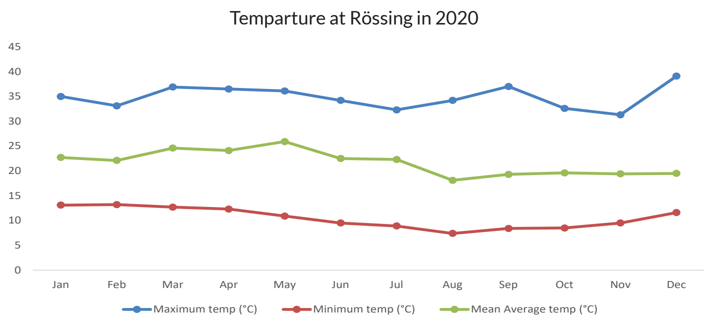


Figure 3. Temperatures measured at Rössing mine, 2020

2.3 Topography and soils

At a mean altitude of 575 m above sea level, most of the Rössing tenement in the west, north and northeast consists of broad peneplains. The flat terrain is traversed by shallow drainage lines and stormwater gullies that drain into the Khan River. Close to the Khan River, the undulating plains change to an increasingly rugged terrain, which further increases towards the Swakop River.

Soils in the vicinity of Rössing could be described as shallow (<25 cm), with a large proportion of coarse fragments and occasional concretions, characterised by high soil pH-values. Hard surface and near-surface crusts are common. The crusts reduce rainfall infiltration rates and enhance run-off.

Sand deposits of varying depth are found in sheltered areas and are a mixture of dark- to light-brown grit, quartz, and feldspar fragments. Coarse material is present on the slopes of some hills. Thickness varies, but may reach a depth of up to about 1.5 m.

The deepest soil is confined to the drainage lines, comprising of mainly infertile – almost sterile – alluvium, that varies in thickness. Moreover, topsoil is shallow, poorly developed, infertile and even absent over the largest part of the hill slopes and gravel plains of the mine tenement.

2.4 Biogeography

On the gravel plains at Rössing, vegetation is dominated by sparsely scattered dwarf shrubs and ephemeral grasslands. This is also the case for the undulating hills and mountains with sparse grass cover. A total of 21 biotopes are discernible to identify landform boundaries in association with ecosystem functions and characteristic plant species. To date, a total of 241 plants species have been identified in the mine vicinity.

Sparse riparian vegetation marks the drainage lines, particular in the Khan River. In general, vegetation relates strongly to the frequency, intensity, and duration of flooding events.

A few species dominate: Anaboom (Faidherbia albida, previously Acacia albida), Camelthorn trees (Vachellia erioloba, still more commonly known as Acacia erioloba), Tamarisk (genus Tamarix) and thickets of the Mustard tree (Salvadora persic). The relatively denser riparian vegetation provides food and shelter to many animal species, and sustains important migration and dispersal routes as a result.

A total of 272 species of ground-living insects are recorded at Rössing; this excludes flying groups such as moths and lacewings. The rocky hillsides, particularly those located along the Khan River, are regarded as the most important habitats of invertebrates.

The Namib Desert is known for its reptile diversity, particularly of lizards and geckos. At Rössing, 33 reptile species are expected to occur. Two species, Merolis sp. Nov and Pedioplanis husabensis, are of special concern. Three species of frogs are known to occur at Rössing. From a local perspective, the Khan River has the highest bird species diversity, indicating the importance of water availability and consequent-supported plant life, as well as the diversity of cliff habitats.

Mammal diversity at Rössing is not very high, as is typical in the central Namib. Climatic variation is closely coupled with marked changes in the abundance of animal species. Many of the animal species that occur around use a wide range of habitats or may cross a wide range while migrating from one habitat to another. Common animal species include klipspringer, oryx, springbok, ostrich, kudu, Hartmann's zebra, dassie (rock hyrax), black-backed jackal, baboons, and rodents (particularly gerbils).

2.5 Surface and groundwater

Open-surface water in the Namib Desert is a rarity and may occur only ephemerally during the rainy season. Flowing surface water on the mining licence area only occurs after heavy rainfall. Run-off in the drainage lines is an episodic, brief event and peaks and periods of run-off vary widely.

Due to their alluvium beds, the tributaries of the Khan River contain subsurface water flow for most of the year. Permeability of the alluvium is high, and the alluvium has also a high storage capacity with the water table being within 2 to 3 m of the surface.

Seasonal springs and small pools may occasionally form in the Khan River and in the gorges that drain into the Khan River. Only one natural perennial spring occurs in the Rössing area and is in a side-arm of Panner Gorge.

Groundwater flows and rainfall seepage at Rössing is mainly along fractures, and focuses towards the gorges that drain into the Khan River.

Super-imposed on the natural groundwater system are sources and sinks created by mining. The open pit, which is more than 300 m deep, cross-cuts the hydrogeological connection between the existing Processing Plant and the Khan River receiving environment. It acts as a cut-off trench and enables the interception and subsequent evaporation of potentially contaminated water moving downstream from the plant area.

The open pit also creates a cone of groundwater table depression that cuts off groundwater flow through bedrock and alluvial channels. Around the open pit, hydrogeological parameters of storage and permeability are very low.

The current elevation of the bottom of the open pit is substantially lower than the level of the Khan River (3 km to the south), and the regional water table (about 20 m below ground). The Khan River is also separated from the open pit by a low-permeability rock mass, and the possibility of water from the Khan River entering the pit void is significantly reduced this way.

The natural groundwater quality in the vicinity of Rössing is very saline with total dissolved solids concentrations of 20 000-40 000 milligrams per litre (mg/L). The only groundwater potentially suitable for agricultural use near Rössing is found in the Khan River. This water is brackish and only suitable for livestock watering.

As a result of the high salinity of the water in the Khan River, the only beneficial uses of the water are for industrial purposes, such as dust suppression. Despite its salinity, the very hardy natural vegetation along the river depends on this water and abstraction is closely linked to monitoring of the water table.

2.6 Air quality

Average daily wind speed measured at Rössing in 2020 was 2.2 metres per second (m/s), with the highest maximum wind speed over a one-hour period recorded at 14.3 m/s in May. These velocities usually occur during the winter and gusts of up to 34.90 m/s have been known to occur before.

Potential for the transport of dust and other impurities via atmospheric pathways towards inhabited areas is dependent on the direction of receptor points relative to wind direction. Table 1 summarises localities relevant to wind direction at Rössing.

Generally, deposited dust is not considered a health hazard, but because it is visible, it could be the cause of public complaints. In suspension, dust particles with a diameter of less than 10 micrometre (μm) can be inhaled by humans. This kind of hazard is determined by concentrations of dust and the period of exposure.

It is not only human health that can be adversely affected by dust: the fall-out of heavy metals onto soil and plant foliage can also result in adverse environmental impacts. Combined with the concern about nuisance dust that may end up on the land neighbouring Rössing's mining licence area ML 28, potential environmental dust deposition is monitored at several stations around the mine site.

While most of the dust generated in the open pit at Rössing is of a fugitive nature, blasting activities can be considered as a point source of particulates, from where dust is dispersed into the surroundings of the mine. Large blasts occur approximately every two weeks, with smaller blasts twice or thrice a week.

The size of the blasting dust plume is unlikely to increase in size because as the pit deepens, the effects of blast dust become less. The dust plumes from the smaller blasts tend to disperse along the length of the pit and the dust settles on the benches and roads within the pit, from where it is remobilised by wind action and vehicles.

Of the eight common air impurities identified, five (SO_2, CO, NOx, PM_{10} and dust deposition) are released at Rössing. However, only two are recognised as significant, i.e., particulate matter smaller than 10 microns in diameter (PM_{10}) and dust deposition, which are regularly monitored. Rössing conducts annual monitoring of SO_2, CO and NOx that could be emitted as a result of the yellow cake roasting at the Final Product Recovery (FPR) plant.

In addition, greenhouse gas (GHG) emissions are estimated as carbon dioxide equivalent (CO_2-e) on a monthly basis, deduced from fuel consumption, electricity usage and the explosives used for blasting.

Noise and vibration arise from exploration and operation activities, including mining, mineral processing, materials handling, infrastructure and on-site transport. Noise, ground vibrations and air blasts can have adverse impacts on the general living conditions of species and/or lifestyle of neighbours and are monitored to mitigate these impacts. In addition, spot-checks, specific surveys and investigations and regular risk assessments are done.

Air blast and ground vibration are monitored to provide information for geo-technical purposes as well, specifically to assess the stability of man-made landforms.

Table 1: Geographical position of localities relative to wind direction

Locality	Distance from mine	Direction	Relative to wind direction
Arandis Town	5 km	Northwest	Does not lie in the direction of E, NE, or SW winds
Arandis Airport	6 km	West	Lies in the direction of E wind
Swakopmund small holdings	50 km	Southwest	Lies in the direction of NE wind at a distance
Swakopmund Town	60 km	Southwest	Lies in the direction of NE wind at a distance
Walvis Bay	75 km	South-southwest	Lies in the direction of NE wind at a distance
Henties Bay	88 km	Northwest	Does not lie in the direction of E, NE, or SW winds

2.7 Sites of archaeological and cultural interest

A total of 49 archaeological and historical sites are recorded at Rössing. Although there is some evidence of upper Pleistocene occupation, most of the archaeological sites date to within the last 5,000 years. A cluster of sites relate to grass-seed digging activities in well-drained soils derived from weathered granite, estimated to post-date AD 1000.

The seed-digging sites are concentrated around a few low-lying granite outcrops associated with shallow depressions, which may contain water after rain, and relate to the seed-digging activities that still exist among Damara-speaking Namibians today. Historical sites also relate to the narrow-gauge railway that operated between Khan Mine and Arandis siding until about 1918.

The Rössing tenement is not an area of outstanding archaeological importance and does not have the dense site clusters which are characteristic of some parts of the escarpment and ephemeral river systems of the Namib Desert.

The areas of highest heritage value lie outside the main focus of mining activity and the mining area, and related high disturbance locations have a rather low heritage value. The sites also show a low vulnerability potential to disturbance. In general, the archaeological and historical sites are mainly of a low individual significance.

2.8 Land use

Apart from Arandis, there is no active land use in the proximity of Rössing's mining licence area. Water around Rössing is severely limited, meaning that agriculture is of marginal potential only, even along the ephemeral water sources of the Khan and Swakop rivers.

The closest commercial farmland is about 15 km to the east, and the border of communal land is about 15 km to the north. Along the lower Swakop River, close to the coast, commercial farming is undertaken on several smallholdings. Production aims to supply the needs of Swakopmund and Walvis Bay and includes asparagus, olive, mushroom, and vegetable farming, as well as tourism- and leisure-oriented activities.

The Rössing mining license area is located within the #Gaingu Conservancy area. Not many people reside within the #Gaingu Conservancy area south of the main road. About 720 ha of the mining licence area overlaps with the Namib-Naukluft Park on the southern bank of the Khan River.

The Dorob National Park is located about 10 km to the west of the mining licence area. Both parks fall within Category 2 of the International Union for Conservation of Nature (IUCN).

3. Environmental management at Rössing

3.1 The management system in effect

All operational activities at Rössing are managed to ensure that all impacts, on both the biophysical and socio-economic environment, are reduced to acceptable limits. Operations are governed through applicable national legislative and regulatory frameworks and managed through an integrated Health, Safety and Environment Management System (HSE MS). The HSE MS conforms to the international standards ISO 14001, ISO 45001, and ISO 9001, of which Rössing is certified to ISO 14001 since 2001.

Based on an understanding of potential health, safety, and environment hazards/aspects, the HSE MS enables Rössing to identify key aspects and impacts, guide operating procedures and strive to continuous improvement in managing these. All potential impacts are listed on a business or site risk register, with related mitigating and operational controls.

The HSE MS is a tool designed to assist in achieving Rössing's goals, including its legal obligations. This systematic approach to management performance promotes the efficient use of resources and offers the prospect of financial gains to the company, generating a win-win outcome in terms of environmental and business performance.

External ISO audits evaluate the HSE MS periodically. In 2020, Rössing Uranium was successfully recertified for the ISO 14001:2015.

In addition to the HSE MS, Rössing implemented the Health, Safety and Environmental Performance Standards in 2005. The intent of these standards is to gain the commitment of the employees on an annual basis to improvement in impact management performance. With the new shareholder, Rössing retained similar standards for managing the various HSE aspects/risks. Rössing will continue to uphold a high level of standards and retain its existing systems for managing HSE on all its facilities. Ultimately, environmental management at Rössing aims at achieving the following:

- Assess environmental impacts of mining activities throughout the design, planning, construction, operational and decommissioning phases;
- Develop, implement, and manage monitoring systems to ensure maximising of avoidance, minimisation, and rehabilitation of adverse environmental impacts;
- Comply with all environmental regulatory and legislative frameworks during all phases of the mine's operations through approved environmental management plans;
- Investigate and exploit measures to reduce usage of non-renewable resources;
- Maximise positive environmental impacts;
- Avoid, minimise, and rehabilitate adverse impacts;
- Avoid contamination through prevention measures (escapes into aquatic and atmospheric pathways), appropriate containment, recycling, and removal measures;
- Protect, conserve, and enhance cultural, heritage and archaeological resources;
- Keep communities informed and involved in decision making about mining activities; and
- Support and encourage awareness, training, and responsibility of environmental management.

The use of a formalised, integrative HSE MS is essential in allowing Rössing to optimise, coordinate and manage the various operations, personnel, plants and equipment and their interactions in a manner that demonstrates consistent application of best practice in environmental management.

Matters of planning, implementation, and operation, checking and corrective action, and management review are embodied in the system. This approach assists in the identification of key environmental aspects and serves to guide Rössing in continued formulation of suitable standard operating procedures (SOPs), and in attaining continual improvement objectives.

Annual HSE management reviews are conducted at Rössing by leaders of the business. The annual review is a necessary part of the continual improvement process and helps senior management focus on the effectiveness of the management system and authorise actions and/or provide resources to improve HSE performance.

The aim of the HSE management review is to ensure that the HSE MS is efficient and effective in managing HSE performance and meeting legal and other requirements.

3.2 Environmental monitoring localities

The comprehensive environmental monitoring network at Rössing includes ambient dust fallout buckets, lithops monitoring, water-quality monitoring boreholes, environmental noise and vibration, and weather stations for meteorological parameters (see Appendix 5).

4. Environmental performance in 2020

Rössing's Environmental Management Plan contains a concise description of the management of environmental aspects and impacts at the mine, covering the various mine phases, from the designing to the decommissioning phase.

No significant environmental incidents occurred during 2020 and no deviation from the Environmental Management Plan was reportable to the respective authorities.

As a resource-intensive industry, Rössing's operations have the potential to impact on natural resources and the environment. For this reason, Rössing focuses continuously on improving environmental management programmes to maximise benefits and to minimise negative impacts. Key environmental management programmes include:

- Energy efficiency and the reduction of greenhouse gas emissions;
- Air quality control (including emissions of dust, other impurities, noise, and vibration);
- Water management;
- Waste management (both mineral and non-mineral waste);
- Chemical substance management; and
- Land-use management (including biodiversity, rehabilitation, and closure).

As part of continuous improvement, there were notable improvements in the environmental monitoring space, as well as awareness on environmental aspects, such as waste management, air quality monitoring, and water quality management. To mention a few:

- On some sections along the Rössing access road, the speed limit was reduced from 100 km/h to 80 km/h to minimise vehicle-wildlife collisions.
- The use of environmentally stable isotopes as an additional tool to support existing methods of groundwater quality monitoring.
- Various progressive rehabilitation and clean-up projects were identified for action; these are aimed at minimising mine closure liabilities.
- A tailor-made training programme for each working area in addition to the annual HSE training and inductions.

The performance in 2020 with regard to the environmental management programmes is discussed in the following sub-sections. Environmental awareness and training are integral components of our environmental management system.

4.1 Environmental awareness and training

4.1.1 Environmental Day commemorations

In support of the World Environment Day celebrations on 5 June 2020, the mine promoted an initiative that aimed to strengthen food security in Namibia. The day was commemorated under the theme 'Biodiversity', with a slogan of 'The Mighty Earth'.

Each employee was given a vegetable seedling to encourage them to start a backyard garden at their homes in towns, villages, and farms. Backyard gardening has been identified as a means of providing year-round access to food for households with short paths to consumers. Crop production is one key initiative, and small-scale gardening has huge potential to enhance food security, especially during the challenging times of the COVID-19 pandemic. Considering that Namibia imports most of its food produce, employees were encouraged to get into the habit of growing their own food, as well as supporting or encouraging their communities to do so. In support of this initiative, the first thirty employees to transplant their seedlings successfully received prizes, Figure 4.

Figure 4: Backyard garden competition winner, Mr John Moody.

Figure 5: Leaners taking part in the competition

4.1.2 Birdwatching event

Rössing successfully hosted its first-ever virtual birdwatching day for Namibian school learners on 20 October 2020. More than 600 learners participated in the virtual event. The 2020 birdwatching day also marked the 19th year that Rössing has hosted this event (although previously they were 'in-person' and not virtual). The local schools in Arandis, Swakopmund and Walvis Bay have always formed the nucleus of Rössing's environmental education activities over the past 18 years.

However, due to COVID-19 regulations, the mine's management decided to offer a virtual birdwatching experience through the Rössing website, thus creating an opportunity for schools from all regions to participate in our environmental awareness initiative. Participating schools watched a video on birdwatching prepared by Rössing, and learners then completed a questionnaire to participate in a competition, Figure 5. The video was narrated by well-known birdwatching guide, Peter Bridgeford.

The aim of hosting a birdwatching event was to give participants an opportunity to view Namibia's unique birdlife and to instil a long-term interest in birds, linked to conserving our local and wilderness biodiversity. For Rössing, the bird watching event is a valuable Additional Conservation Action (ACA), contributing to the company's Biodiversity Action Plan that strives for the protection of environmental quality, mostly in terms of biodiversity.

4.1.3 'Animals have right-of-way' campaign

Due to human-wildlife conflicts on the Rössing access road over the years, we introduced the 'Animals have right-of-way' campaign. The aim of the initiative was to reduce human-wildlife incidents on our roads and to remind all employees, contractors, and visitors to be responsible on the road. Wildlife having right-of-way means that employees should be prepared to stop for the animal to cross the road.

An 'Animals have right-of-way' billboard was erected as an awareness reminder for employees and the public, Figure 6. The campaign is intended to create a healthy respect for wildlife on our roads, and to keep us safe as the road users.

Figure 6: An 'Animals have right-of-way' billboard was erected on the road to the mine as an awareness reminder for employees and the public.

An accident zone was mapped, based on the vehicle wildlife incidents on our road, to create an awareness for all road users to be cautious and to avoid collisions with wild animals.

The speed limit on the Rössing access road was also changed from 100 km/h to 80 km/h. The reduction of the speed limit will help to minimise the chances of colliding with animals by being able to stop the vehicle at ease.

The awareness campaign is a result of our continuous effort to manage vehicle-wildlife incidents on the Rössing access road, by acknowledging the responsibility of Rössing to ensure that all wildlife in our mining license and accessory work areas is protected. The responsibility to protect all wildlife is linked to our license-to-mine, and it is also endorsed by our commitment as a company to the Environmental Management Plan and our HSSEC policy.

4.1.4 In-house waste management training and 'Wapaleka' cleaning initiative

The Rössing Environmental Performance Standard requires all employees who are involved with hazardous materials handling and waste handling to be trained so that they understand the environmental hazards and risks for routine activities and emergency actions.

To ensure compliance on waste management, regular inspections are carried out in workshops, storage, and disposal areas. The outcome of these inspections guides the training content. This is to ensure that shortcomings, which are identified, are addressed for the relevant areas.

During 2020, an approximate 300 employees and contractors attended the hazardous material and waste management training.

The 'Wapaleka' cleaning campaign was re-introduced and launched in 2018 ('Wapaleka' means 'clean up' in one of the local languages, namely Oshiwambo). The initiative promotes waste segregation, voluntarily cleaning, and improved workplace conditions in and around the mine site. In 2020, reduced participation was observed due to the reduction of workforce onsite as a mitigation measure for COVID-19. A total number of 105 refuse bags were collected voluntarily, which is equivalent to 1.1 tonnes of waste, in addition to the waste managed through the integrated waste management contractor.

Figure 7: Loide Hausiku (Environmental Advisor) at the waste bin donated to Westside High School in Swakopmund.

4.1.5 Donations to the community

Rössing supported the Community Skills Development Centre (COSDEC) by donating 10.3 tonnes of redundant wood pallets towards the joinery and cabinet-making workshop in Swakopmund.

In addition, a waste sorting stand was donated to West Side High School to promote the 3Rs. The stand was fabricated by using offcuts from the plate shop and covered with redundant wood pallets collected from site, Figure 7.

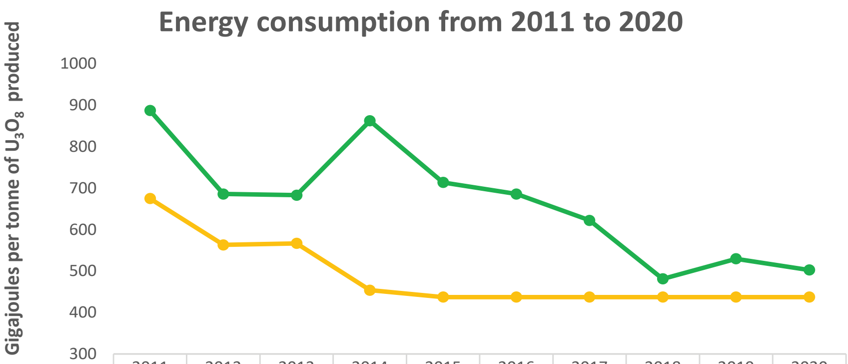
4.2 Energy efficiency and greenhouse gas emissions

As part of the environmental commitment and priority, Rössing measures and manages its greenhouse gas (GHG) emissions and energy intensities. This helps in improving energy efficiencies and reduce GHG emissions. Sources of GHG emissions at Rössing are electricity and fuel consumption, the transporting of reagents and uranium, blasting (explosives), waste (sewage, rubbish disposal and landfill), and the extraction and processing of ore. The intensity of emissions is reported per unit of uranium oxide produced.

In 2020, the total energy consumption of the mine was 1,251,283.42 GJ for 2,489.03 tonnes of uranium oxide drummed. This converts to an annual energy consumption of 503 GJ per tonne (GJ/t) of uranium oxide produced, which is 15 per cent above the projection target of 438 GJ per tonne uranium oxide produced, Figure 8.

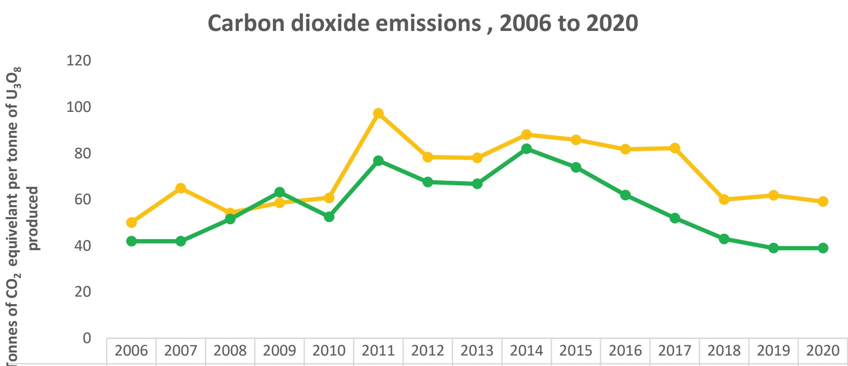
Energy consumption decreased in 2020 compared with 2019, which could be linked to the ore grade that decreased from 0.371 kg/t in 2019 to 0.343 kg/t in 2020, as well as to the decreased total mined tonnage, from 22.4 million tonnes in 2019 to 19.3 million tonnes in 2020.

In 2020, emissions of carbon dioxide (CO_2) per unit of production amounted to 59.1 tonnes of CO_2 equivalent per tonne (CO_2- e/t) of uranium oxide, which is above the target of 39 tonnes CO_2-e/t of uranium oxide for the year, Figure 9. This could also be attributed to the decrease in ore grade.



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual	887.6	686.01	683.27	862.68	714.081	686.0695	622.6307	481.3033	529.9323	502.7185
Target	675.14	563.5	566.95	454.12	437.57	437.57	437.57	437.57	437.57	437.57

Figure 8: Energy consumption, 2011-2020 (gigajoules per tonne of U_3O_8 produced)



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual	50.1	64.9	54.2	58.63	60.76	97.35	78.41	78.04	88.12	85.87	81.81	82.26	60.044	61.855	59.141
Target	42	42	51.6	63.2	52.57	76.84	67.62	66.85	82	74	62	52	43	39	39

Figure 9: Carbon dioxide emissions, 2006-2020 (tonnes of CO_2 equivalent per tonne of U_3O_8 produced)

4.3 Air quality management

Rössing Uranium has committed to protect the environment from the harmful effects of air pollution caused by its mining activities.

Mining activities such as blasting, loading, and dumping of ore and waste, crushing, and conveying or grinding operations, and driving on dust stirred up by vehicles on roads creates dust, as well as noise and ground vibrations.

Dust particles are so small that they can get into the lungs, potentially causing serious health problems, as well as also causing environmental effects such as:

- Reducing visibility;
- Stain and damage buildings and statues;
- Increase acidity in water bodies; and
- Deplete the soil and damage plants.

Therefore, dust emissions, noise and ground vibrations created during mining activities require an understanding of the impact they have on the people and the environment affected. Hence, an air quality monitoring programme (AQMP) is in place to measure and monitor air pollutants in the area and its surroundings and implement programmes that will help in the reduction of this impacts. PM_{10} and dust fallout monitoring stations are depicted in Figure 10 below.

4.3.1 Environmental dust

Rössing is in an arid environment, which makes dust one of the greatest sources of air pollution in terms of its mining activities. Dust emission is a public concern to the residents of Arandis and Swakopmund, especially when high-velocity winds occur during the winter months.

The AQMP in place helps in quantifying dust fallout and allows for mitigation when necessary. The measures are taken to ensure that exposure levels do not exceed the adopted occupational limits, and that the controls efficiently detect differentiations resulting from process changes.

There are two types of dust 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_{10}), and secondly, fallout dust, which is visible on the ground and comprised of lager particles, including PM_{10}.

The measure of PM_{10} 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 continuously monitor PM_{10} dust levels onsite at three dust monitor stations, and at one PM_{10} station in the nearby town of Arandis (see Figure 10 denoted by pink triangles). As part of the best practices and Rössing standards, to improve adaptive management and understanding of the ambient dust contributing activities, real time data loggers/ remote communication for the PM_{10} monitoring stations is in place. This enables immediate investigation and observation of the current actual conditions and allows Rössing to improve its controls, as well as linking visual events to the results instantly. It also helps with the visibility on functionality of equipment for a prompt response towards maintenance, which improves data availability.

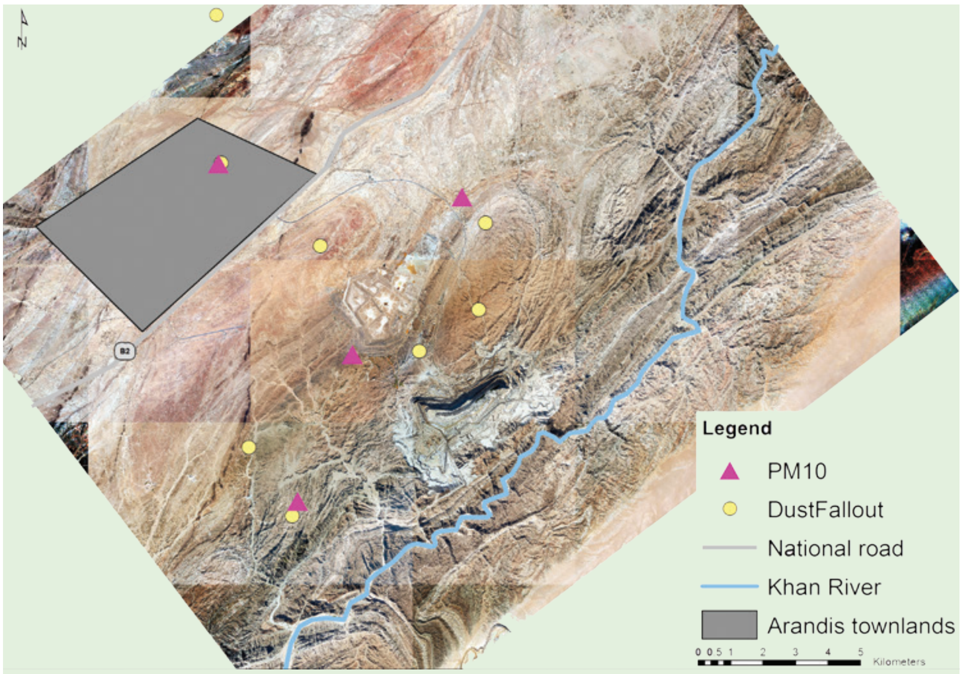


Figure 10: PM_{10} dust monitoring network samplers and dust fall-out buckets

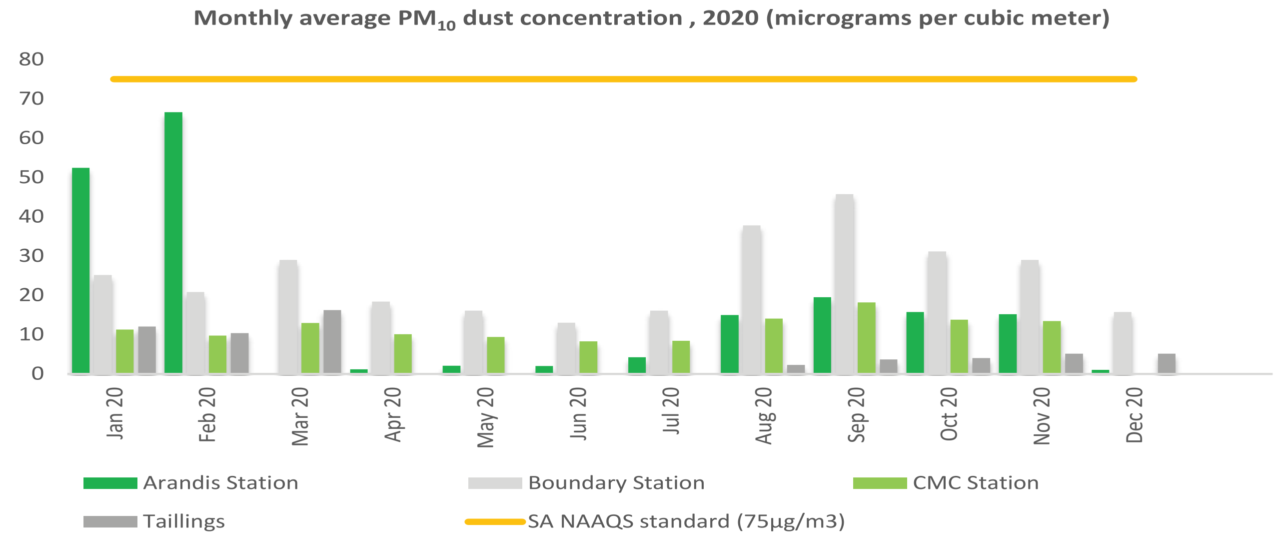


Figure 11: Monthly average PM_{10} dust concentration, 2020

The levels measured in 2020 showed that PM_{10} dust concentrations at all stations were below the adopted World Health Organisation standard of 75µg/m³, Figure 11. There were no records for the Arandis and CMC stations for the month of December, while at the Tailings station, data was not recorded from April to July, all due to faulty monitoring equipment at these stations for the mentioned months.

4.3.2. Ambient dust fallout

An aspect of the air quality management at Rössing is measuring the dust fallout which may result from our mining activity, which may adversely affect the surrounding environment and the residential inhabitants.

In the absence of Namibian legislation, Rössing has adopted both the South African National Dust-control Regulation (SA NDCR) and the World Health Organisation dust fallout limits of 600 mg/m² per day for residential and 1,200 mg/m² per day for non-residential areas, with an annual average target of 300 mg/m² per day.

Dust fallout is measured at six stations at different locations around the mine boundary. Values measured during 2020 at the six stations ranged between 1 and 140 mg/m² per day, with an annual average of 18.3 mg/m² per day, Figure 12.

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

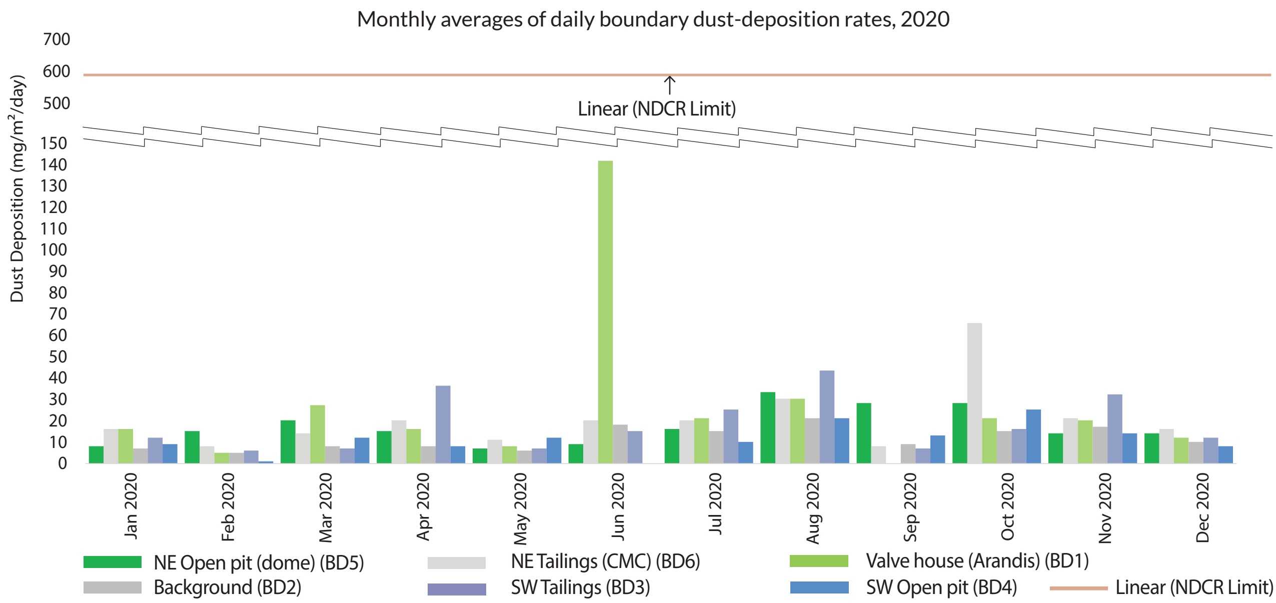


Figure 12: Monthly averages of daily boundary dust-deposition

4.3.3 Noise and vibration

In the absence of Namibian legislation on environmental noise and vibration, Rössing has adopted or referred to the United States Bureau of Mines (USBM) RI 8507 criteria for safe blasting, and for operational noise to the relevant South African National Standards Code of Practice, SANS 10103:2008 (SANS, 1992).

Noise and vibration are monitored through a network of various points and studies. Environmental noise is monitored according to a specific procedure and reported monthly to help identify events when these levels have been exceeded.

In 2020, both air-blast and ground vibration levels were consistently below the limits of 134 dB and 12.5 mm/s, respectively. Blasting is only carried out in the open pit, and monitored at two places, namely onsite and in Arandis.

Environmental noise is measured over snapshots of ten minutes at six different sampling points or stations, namely Station 1 - Rössing Main Mine Access Road, Station 2 - Arandis Airport Gate, Station 3 - Khan River Valley, Station 4 - Khan River Rock Island, Station 5 - Khan Riverbed, and Station 6 - Khan Riverbed.

Eleven noise measurement campaigns were conducted throughout 2020, Figure 13, with no measurement in February due to the instrument being sent away for calibration. There were exceedances against the Rössing internal noise level of 45 dBA, in January, June, July, August, October, and November. These exceedances were due to strong winds, aeroplanes overhead and cars driving to the airport, all of which are not associated with the mining activities.

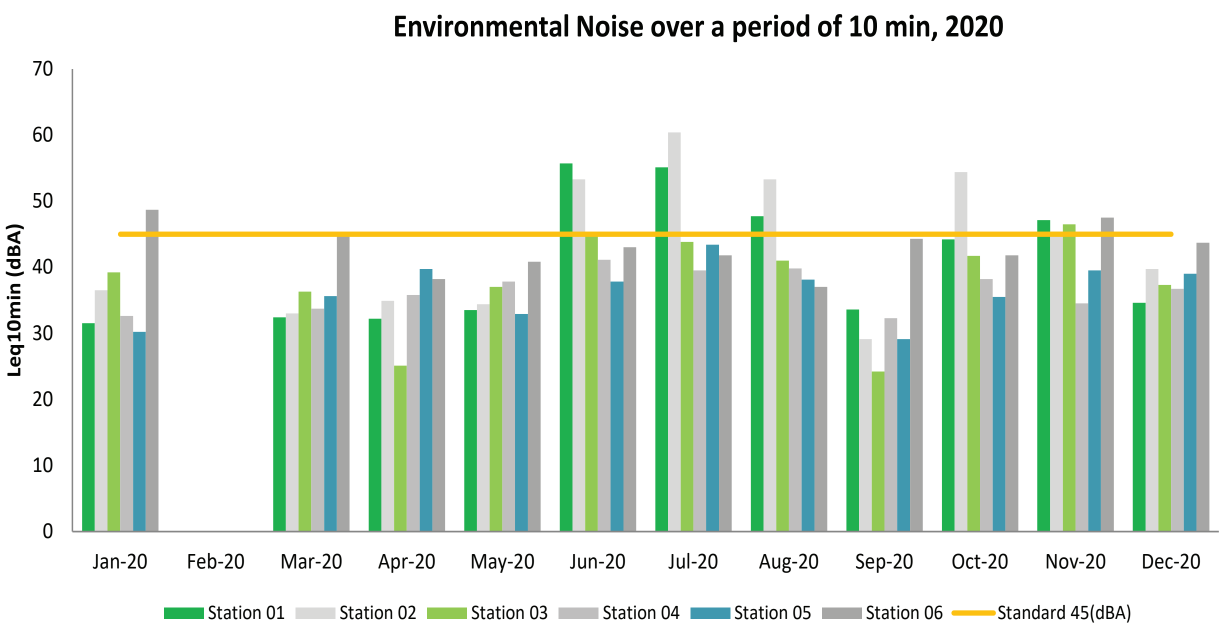


Figure 13: Environmental noise over a period of 10 minutes, 2020

4.4 Water management

Water management at Rössing is guided by a formal water strategy and Water Management Plan, both of which are developed according to our Performance Standard on "Water quality protection and water management".

Water management covers all activities connected to water abstraction, transport, storage, usage (potable and process), impounded water, and groundwater. The intent of the standard is to ensure efficient, safe, and sustainable use and protection of water resources and ecosystems.

In accordance with Namibian legislation, the Water Resources Management Act of 2014, the Ministry of Agriculture, Water and Land Reform (MAWLR) is the custodian of all water resources in the country. Under this mandate, MAWLR issued Rössing with two permits, namely the:

- Industrial and Domestic Effluent Disposal Exemption Permit # 674, and
- Khan River Water Abstraction Permit # 10 200.

4.4.1 Total water usage

The monthly freshwater usage shown in Figure 14 totals to 2.51 Mm^3 for 2020; this amount is 13.1 per cent below the planned 2.88 Mm^3 for the year. The planned freshwater annual volumes are based on planned tonnes to be milled for that year. Freshwater consumed per tonne of ore milled was 0.288 m^3/t, and the ratio of freshwater to total water consumed was 0.382.

Monthly freshwater usage was below the planned water usage for most of the months. Worth noting, is the actual water usage for February, which was severely affected by interruptions in water supply. Also, we had our annual maintenance shutdown of the plant in November, after which production was interrupted by several unprecedented pipe bursts, resulting in lower water usage against the planned target.

4.4.2 Khan River water usage

Saline groundwater from the Khan River aquifer, in conjunction with biodegradable dust suppressant polymers, is used to suppress haul-road dust in the open pit. A total of 169,458 m^3 of water was abstracted from the aquifer during 2020, which is 19.5 per cent of the permitted 870,000 m^3 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 Land Reform.

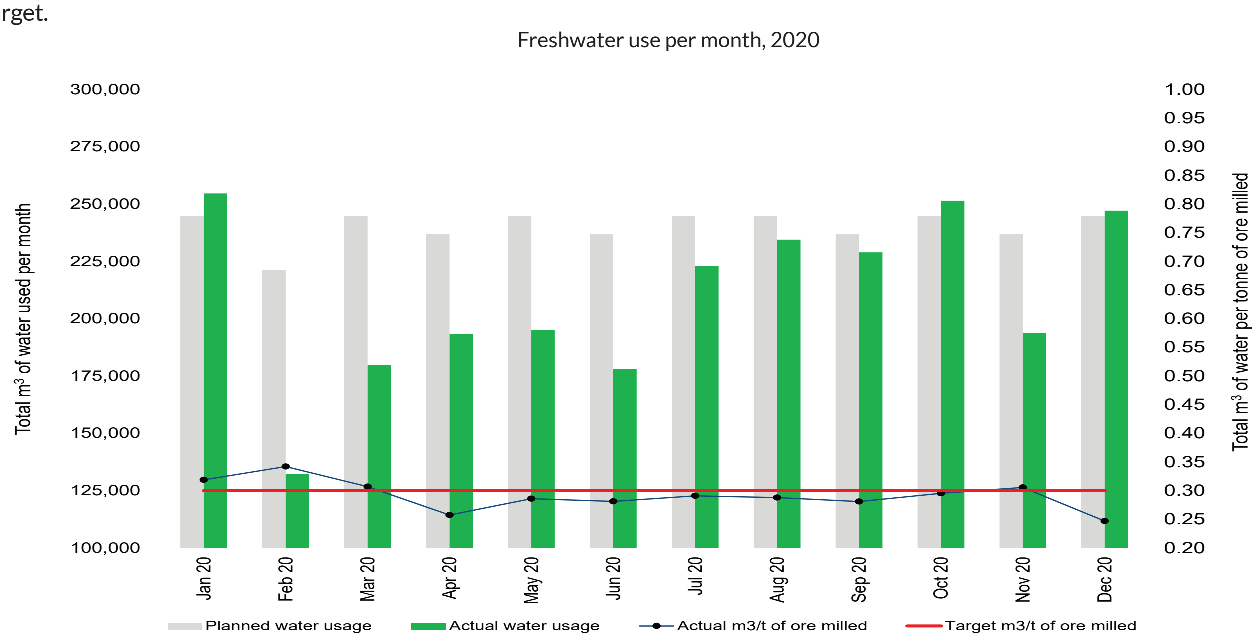
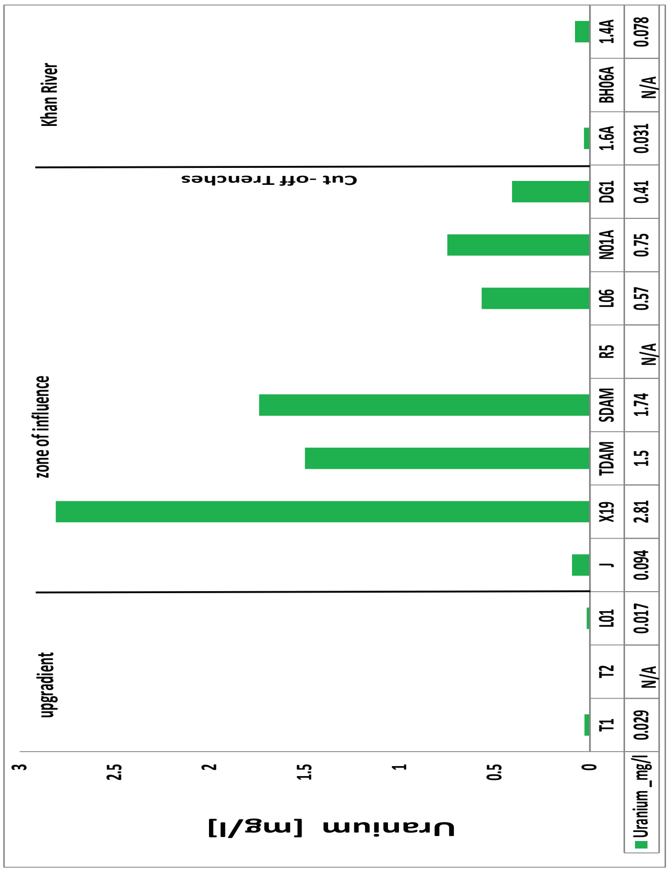
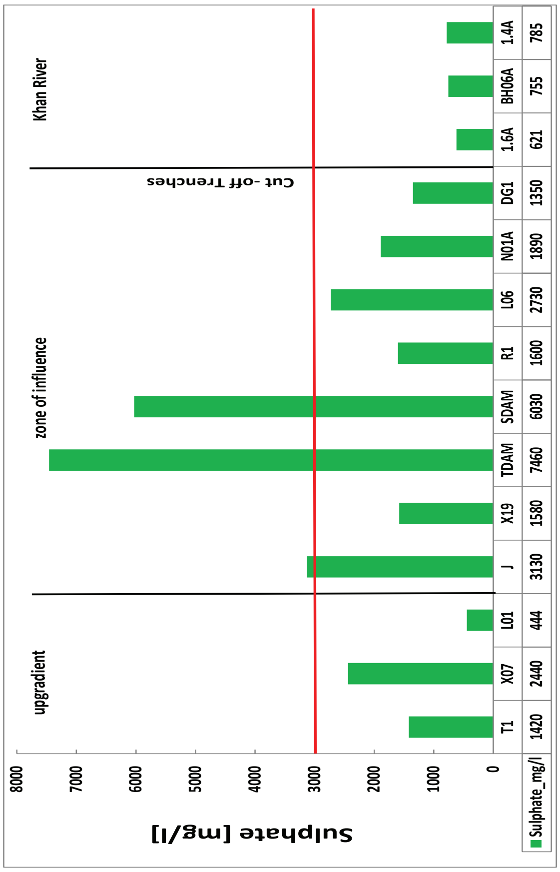


Figure 14: Freshwater use per month, 2020 (cubic metre)





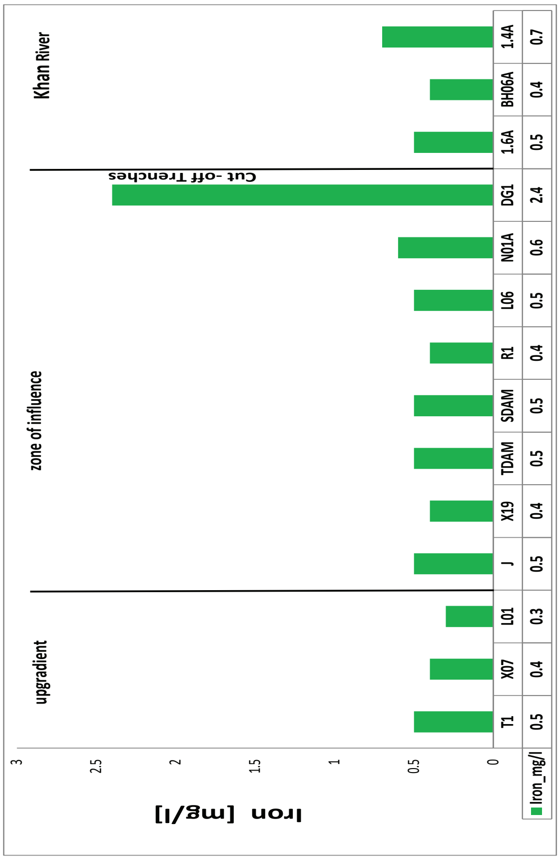


Figure 15: Water quality overview for 2020

4.4.3 Groundwater quality protection

Rössing's Tailings Storage Facility (TSF) is the source of potential groundwater contamination. Contaminated tailings seepage could potentially reach downstream water users in the Swakop River via the aquatic pathways of the alluvium and rock aquifers on site, and eventually the Khan River.

Therefore, the objective of the groundwater quality protection programme is to curb contaminated seepage from the TSF from entering the Khan River. To achieve this, a network of abstraction points, wells, sumps, and trenches close to the source and in the wider environment are equipped to pump this seepage continuously. Abstracted seepage water is discharged into the overall recycle and reuse stream.

To ensure the effectiveness of these control systems, a groundwater level and quality monitoring network is in place. Water quality data is managed through a database and both water quality and water level data can be displayed using a geographical information system. This function allows for quick and effective spatial display of data, which improves data comparison and interpretation and the management of the seepage control network.

Rössing's water quality monitoring schedule is a listed item in the "Industrial and Domestic Effluent Disposal Exemption Permit" issued by the Ministry of Agriculture, Water and Land Reform. Water samples are analysed by independent accredited laboratories, namely IAF Radioökologie GmbH (Germany) and DD Science cc (Republic of South Africa).

In the selection of graphs depicted in Figure 15, concentrations of ions from chemicals used in the Processing Plant are shown. Sampling locations are shown on the x-axis of the graphs and the graphs are grouped into upgradient background (which is the area unlikely to be influenced by seepage), zone of influence (the area within and downstream of the seepage plume, but upstream of the last seepage control systems and the cut-off trenches, which is the area which is or has the potential to be contaminated), and downstream-receiving environment (Khan River) based on locations.

The sulphate concentration follows a somewhat bell-shape distribution with the highest peak observed in the TDAM (Tailings Dam) samples. This is to be expected since the TDAM sample represents water from the Processing Plant with the potential to affect the surrounding water quality.

What is evident from all the graphs, is that the concentration of elements reduces substantially as the seepage interacts with the surrounding environment, i.e., concentration of ions reduces away from the source. All four charts indicate higher concentrations within the zone of influence, particularly in the areas where the seepage plume has been delineated.

It has been suggested through various geochemical models that the decrease in concentrations of certain ions away from the source of contamination may be due to chemical precipitation of mineral phases within the tailings profile and the natural environment.

The approximate extend of the seepage plume for 2020, and boreholes plotted in Figure 15, are depicted in Figure 16.

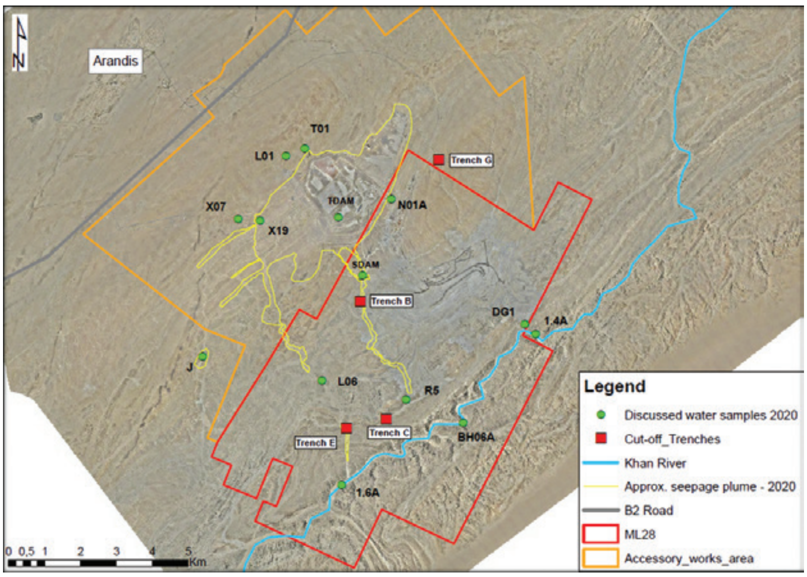


Figure 16: Locations discussed for water quality

4.5 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.

4.5.1 Management of non-mineral waste

Non-mineral waste at Rössing is characterised into two classes, namely 'general' and 'hazardous' waste in accordance with the risk it poses. The non-mineral waste generated onsite includes scrap metal, redundant conveyor belts, used oil, domestic waste, and the lubricants from maintenance activities.

The aim of waste management at the mine is to promote the 3Rs to ensure that waste generated onsite is reduced, reused, or recycled and disposed of in accordance with not only Rössing's standards, but all applicable laws, regulations, best practices, and permit conditions.

Rössing developed a Non-mineral Waste Plan (JE20/MMP/001) and a Non-mineral Waste Procedure (JE50/WMP/001) that addresses all non-mineral wastes generated through the operational phases to ensure sound management through minimisation of waste generation and safe handling, treatment, and disposal of waste. An integrated waste management contract was awarded to Karee Investment (a local Namibian-owned waste management contractor) since 2016 to handle and remove recyclable materials and packaging materials onsite.

Waste onsite is being managed by an integrated waste management contractor that was appointed in December 2019. The waste management key performance indicators (KPIs) were aligned, and the variation agreement was signed in July 2020. The waste contractor will handle both hazardous and non-hazardous waste streams and ensure proper treatment and disposal. As part of good corporate governance, Rössing monitors all recyclable types of waste streams (such as used oil, scrap metal, wooden pallets, and packaging materials) sent offsite for treatment, recycling or disposal by performing a verification assessment of contractors and facilities to confirm that the wastes are being managed appropriately.

During 2020, a total of 732.5 tonnes of recyclable waste material (mainly used oil and scrap metal) were removed from site by the contractor to the offsite recyclers. Domestic waste is transported from the mine site to the Rent-A-Drum sorting facility in Swakopmund. The recyclable and reusable waste is dispatched to Windhoek at the contractor's refuse-derived fuel plant, while the non-recyclable waste is disposed at the municipal landfill site in Swakopmund.

Contaminated waste includes both radioactive and non-radioactive contaminated waste materials (such as empty paint containers, air filters and processed mineral waste) that are generated from mining, the workshops, as well as from the Processing Plant areas.

In 2020, 1,557.7 tonnes of contaminated solid waste were disposed of on the Tailings Storage Facility, while 213.7 tonnes of oil sludge soil were disposed of at the bioremediation facility for treatment. No soil was successfully treated during 2020. Garden waste (18.8 tonnes) was disposed of at a dormant landfill site, while non-contaminated building rubble (382.1 tonnes) was disposed of at Waste 5 at the open pit, see Table 2 below.

The medical waste stream is managed by the medical personnel onsite, and is transported to Medixx in Arandis before it is dispatched to Walvis Bay for incineration. During 2020, a total of 0.34 tonnes of medical waste were generated, which is less than the 0.45 tonnes generated in 2019.

The different types of hazardous waste streams generated onsite include used oils, filters, grease, redundant chemicals, batteries, and other items such as fluorescent tubes and e-waste. A total of 127.8 tonnes of hazardous waste was recycled with the offsite approved waste handlers, while 46.5 tonnes of the non-recyclable waste was disposed of at the Walvis Bay hazardous landfill site.

Table 2: Non-mineral waste (tonnes)

Year	Steel	Cardboard & paper	Wood	Plastic	E-waste	Conveyors	Land filled	Total recycled	Total waste	% of total waste recycled
2010	3,128	13	45	6	3	85	672	3,380	4,052	83.4%
2011	2,314	30	91	15	-	-	746	2,517	3,254	77.1%
2012	2,930	8	45	7	-	63	415	3,055	3,470	88%
2013	908	26	115	9	-	21	165	1,182	1,347	88%
2016	315	9	49	6	-	2	0	421	916	46%
2017	1734	11	34	23	-	2	0	1,953	1,804	>100%
2018	1 188	9	73	2	-	34	1,478	1,321	2,784	47%
2019	720	14	66	8	7	107	2,766	1,419	4,185	34%
2020	494	21	42	8	-	39	1,577	733	2,569	28.5%

4.5.2 Management of mineral waste

At Rössing, mineral wastes are identified as waste rock and overburden, as well as tailings and in the future heap leach waste (ripios). While Rössing managed the disposal of these waste streams throughout the life-of-mine, this was not always done through a formal waste management plan. A formal management plan for mineral waste is required by the Rössing Performance Standard E4 (Chemically reactive mineral waste management). The standard sets the criteria against which Rössing is audited. It stipulates, inter alia, that waste disposal facilities should be located and designed to minimise environmental, health, safety and community impacts and risks. Facility location and design should be consistent with the long-term physical and chemical behaviour of the waste and must result in repositories that are physically and chemically safe and stable during operation and after closure.

During 2020, a total of 18.7 million tonnes of mineral waste were generated by the mine. This includes 8.7 million tonnes of tailings and 10.0 million tonnes of waste rock. At the end of December 2020, the total cumulative mineral waste stored onsite was 991.7 million tonnes of waste rock and 474.2 million tonnes of tailings.

Tailings were deposited on the existing Tailings Storage Facility. The tailings footprint has shown a slight increase of 1.4 ha due to starter walls being built for the future deposition in the Y3 Paddy. The rock waste was deposited on top of the existing rock dumps close to the open pit without the footprint being extended.

An inventory of mineral waste is kept at Rössing. It reflects the tonnage per year, the cumulative tonnage, surface area, volume, and the location of waste, Table 3. Also, site maps are maintained. The spatial footprint of mineral waste is also maintained and reported annually. Identification of the primary hazards posed by mineral waste was done in 2007. Primary hazards associated with mineral waste and reflecting the potential impacts at Rössing are:

- Radioactivity from waste rock, low grade storage facilities and the tailings facility (radon emanation and radionuclides in dust);
- Although there is a possibility that asbestos and asbestiform can be found in dust from the pit and crushing plant because of metamorphosed magnesium carbonate (such as marble) and the presence of serpentine, none has been found when monitored so far;
- Uranium and its decay products can be released into seepage water (from the TSF);
- Acidic drainage is possible where mineral wastes are in contact with water; and
- Residual nitrate, from the use of blasting agents, can be solubilised from waste rock and migrate to underlying groundwater.

Table 3: Mineral waste disposed in 2015-2020 (tonnes)

Year	2015	2016	2017	2018	2019	2020
Waste rock dumps	12,522,652	16,467,097	15,109,738	11,459,319	13,289,588	10,000,000
Tailings storage facility	6,875,719	9,194,439	8,962,923	8,851,288	8,006,059	8,700,000

4.5.3 Chemical substance management

Rössing uses existing Namibian legislation, international standards such as ISO 14001:2015, as well as the Rössing Performance Standard E2 (Hazard materials and non-mineral waste control and minimisation) for conformances and compliance in terms of chemical substance management.

The aim is to ensure that all hazardous materials are handled safely and controlled responsibly, and all risks to the environment are mitigated. For this reason, monitoring programmes are in place to prevent spillages and environmental contamination from the transport, use, storage, and disposal of hazardous materials.

A Hazardous material and contamination control management plan (JE20/MMP/002) is in place at Rössing.

The plan guides:

- safety and responsibility of usage and control of hazardous material handled by Rössing;
- control measures to minimise the risks and the environmental impacts due to spill or other escapes; and
- properly characterise and manage cases of contamination on site.

The plan also entails controls to prevent or minimise spillages during the handling and storage of chemical substances, conducting of routine inspections, monitoring procedures for leaks, integrity testing for deterioration of storage tanks and pipelines, spill and leakage detection equipment and emergency response plans. Regular internal and external audits, inspections, and monitoring take place.

The Rössing standard requires an inventory of all hazardous substances and locations onsite to be maintained and valid material safety data sheets (MSDS) to accompany the hazardous material during storage, handling, and transportation.

All employees who handle hazardous material are required to attend compulsory training on hazardous material substances on an annual basis. Stakeholders (suppliers, service providers and end-users) are engaged to provide support in the purchasing of chemicals, and to ensure continuous improvement. Furthermore, the plan identifies the needs for engineering controls to prevent spillages, for example by means of secondary bunds.

During 2020, non-destructive and thickness testing were carried out on the ammonia storage tanks onsite, and the floor of one acid storage tank in Walvis Bay was repaired.

All spills and leakages of hazardous material are reported and recorded on our incident management system for internal investigations. Lessons learned are shared for continuous improvement.

For 2020, only minor incidents occurred in controlled areas and these posed no environmental non-conformances.

4.6 Land-use management

Rössing's total footprint increased from 2,552.59 ha in 2019 to 2,558.45 ha in 2020. The rock dumps' footprint increased in both the western and eastern areas of the open pit, with waste dump 2 increasing to 1.4 ha and waste dump 7 to 3.0 ha. This is due to the improvement in the method used to obtain the data.

Previously, conventional survey methods were used with the rock contact being projected down onto a surface. Presently, a drone is used to survey the rock dumps. Therefore, the new method used shows an increase, but there has been no increase in the footprint of the waste dumps. However, the Rössing footprint was amended to reflect the correct size of the waste dumps.

The footprint of the TSF has shown a slight increase with 1.4 ha due to starter walls being built for the future deposition in the Y3 Paddy.

Various plant species of conservation value were rescued and replanted at the mine site.

4.7 Biodiversity management

The protection of environmental quality, including biodiversity, is important at Rössing. We take pride in the conservation of biodiversity within the ambit of the Rössing mining licence, in the surrounding communities, as well as in Namibia at large. Biodiversity management is a practice of protecting and preserving the wealth and variety of species, habitats, ecosystems, and genetic diversity on the planet, which is important for our health, wealth, food, and the services we depend on.

In 2020, Rössing continued to enshrine biodiversity protection in the Health, Safety, Environment and Communities (HSSEC) policy by assessing and considering ecological values and land-use aspects in investment, operational and closure activities.

We continued to be proud members of the Namibia Environmental and Wildlife Society (NEWS), which gave us an opportunity to publish an article on waste management and the promotion of the reduce, reuse, and recycle tenets (3Rs) at Rössing.

Our goal remains to create a positive impact on biodiversity and contribute to conservation in Namibia at large. Rössing was involved in various biodiversity awareness campaigns, surveys, and assessments aimed at creating awareness and strengthening understanding about the importance of biodiversity amongst the workforce, communities, and the Namibian population.

4.8 Progressive rehabilitation

Fifteen progressive rehabilitation projects were identified for execution in 2020. These projects are in various departments and owned by respective managers who report on their progress in quarterly progressive rehabilitation and closure steering committee meetings.

Due to COVID-19 pandemic related restrictions and other limitations, very little progress was made on most of the projects with most of them deferred to 2021.

The projects comprise various clean-up campaigns, the decommissioning of redundant equipment, as well as pilot trials aimed at informing mine-closure planning.

4.9 Closure planning

The current Rössing mining plan foresees cessation of production at the end of 2026, which is six years from now. The mine closure plan is in place and is reviewed and updated from time to time. The plan guides and consolidates the information on closure planning, and as such it functions as a tool to gather developing knowledge on a continuous basis.

Various infrastructures and features are classified as per different domains, and therefore a plan exists for each domain. For example, in terms of the Open Pit domain: the main feature is the pit, which will not be backfilled and is envisaged to remain a mining void, but which will be reworked to prevent easy access for humans and wild animals.

In another domain, the Tailings Storage Facility, the tailings will be managed in a manner that will prevent aeolian (wind generated) and fluvial (water driven) soil erosion, while seepage water will be routed towards the open pit via an open trench for evaporative disposal.

The Processing Plant and the mine's infrastructure will be demolished. Feasibility studies will determine the viability of decontaminating recyclable metal for selling; if not feasible, the option to safely dispose all metal in the open pit is also been investigated.

Closure planning has always been part of the business strategic planning over the years. However, with recent changes in majority shareholding and the current life-of-mine approaching, extensive closure plan reviews were held to ensure practical and achievable targets/objectives are set for the business.

Rössing developed implementation plans for mitigation measures and calculated the associated closure costs, which were, to a high degree of certainty, confirmed to be sufficient.

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 2021/2022 alongside some key studies, as well as other scientific investigations.

The Rössing Environmental Rehabilitation Fund remains well in place, with annual contributions to the fund calculated according to the current total projected costs associated with mine closure. The contributions are made to ensure sufficient funds being available at the time of closure.

5. Appendix

Environmental monitoring stations at Rössing Mine (Drawn: K. Dierkes, 2018)