



Annual Review

2019



Always learning, always improving the way we work

Namibian Uranium Institute

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Foreword



The Namibian uranium industry is unique because of its activities in an area that hosts a variety of uranium deposits, but at the same time has a high biodiversity, geomorphology and cultural conservation value. Operating on the doorstep of an iconic World Heritage Site, the Namib Sand Sea, and sharing the environment with another important Namibian industry, the tourism sector, requires a sensitive approach and a readiness to accept additional obligations. Exploration and mining companies involved in the Namibian uranium sector, as well as their service providers, fully recognise that managing biophysical and social environmental issues, radiation, health, safety, and waste is of paramount importance. They therefore subscribe to the Namibian Uranium Association's (NUA) stewardship principles, and the Namibian Uranium Institute (NUI) is the organisation that carries out NUA's stewardship mission by facilitating collaboration in environmental management and research between NUA members, providing training in relevant skills, supplying factual and scientifically sound information to NUA's stakeholders, identifying leading best practises, and thereby promoting the Namibian uranium brand.

Almost all Namibian uranium activities occur in the central western Erongo Region of the country, a region that is characterised by its aridity, vast desert landscapes, scenic beauty, high biodiversity and endemism, and heritage resources. At the same time the region makes important contributions to Namibia's economy, and mining plays a major role in making this contribution. The natural conditions are such that the Namibian uranium exploration and mining activities occur in an ecologically sensitive area, containing parts of the Namib-Naukluft and Dorob National Parks. Mining and the associated activities are vital for the growth of the Namibian economy, and development objectives and mineral exploitation must therefore co-exist with environmental protection in order to ensure long-term socio-economic growth and stability. NUI promotes an integrated approach to ensure that the development of one resource

does not jeopardize the potential of another resource by working closely with all stakeholders in government, the private sector and civil society.

In accomplishing its mission, NUI is guided by respected independent scientists who serve on NUA's Scientific Committee, and the institute also has close ties with the Namibian University of Science and Technology (NUST). Sustainable Development issues are addressed by NUI's Sustainable Development Committee and its Working Groups. NUI actively supports the Namibian Government's endeavours to make sustainable development a lasting reality in Namibia. The UN 2030 Agenda for Sustainable Development with its 17 Global Goals and the African Union's Consolidated Position on these goals further guide NUI in assessing the contribution that the uranium sector can make towards Sustainable Development.

NUI also continues to be the Namibian Government's partner in the implementation of the Strategic Environmental Management Plan for the Namibian Uranium Province (SEMP). The SEMP is an over-arching framework and roadmap addressing the cumulative impacts of existing and potential developments and the extent to which uranium exploration and mining is impacting the central Namib. Close cooperation with the SEMP office at the Ministry of Mines and Energy's Geological Survey of Namibia ensures that all aspects of the key indicators of the environmental quality objectives included in the SEMP are monitored closely and reported regularly. In doing so, NUI remains an active contributor to the compilation of the Annual SEMP Reports.

I would like to thank all stakeholders for their support and guidance during 2019, and in particular acknowledge the NUA Board, NUI's committee and working group members, and the NUI staff for their hard work and dedication. All of you have enabled NUI to make its contributions both locally and internationally, and spread the message of

the environmentally responsible way in which uranium is explored for and mined in Namibia.



Dr Gabi Schneider

Executive Director

Namibian Uranium Institute



Iconic and Endemic: The Husab Sand Lizard

1 The History of the Namibian Uranium Institute

1 The History of the Namibian Uranium Institute

The so-called Uranium Rush some 10 years ago resulted in the establishment of the Namibian Uranium Institute (NUI) . Initially, a Uranium Stewardship Committee (USC) was formed in 2008 under the auspices of the Namibian Chamber of Mines, in order to promote the Namibian uranium brand and to identify and propagate appropriate best practices within the Namibian uranium industry. Subsequently, in 2009, the Chamber of Mines' Uranium Institute (UI) was launched with a focus on improving environmental management, radiation safety and health care.

In 2013, the Chamber of Mines identified the pressing need to review the situation following the Fukushima tsunami, in order to establish a sustainable management and service delivery entity that can effectively address the key issues faced by the Namibian uranium industry. As a result, the Namibian Uranium Association (NUA) was established, and the UI became the NUI operating under the auspices of the NUA.

From the beginning, exploration and mining companies involved in the Namibian uranium sector have fully recognised that managing environmental issues, radiation, health and safety, and waste is of paramount importance in order to protect staff, the general public and the receiving environment. Responsible management of uranium mining and processing applies to all stages from planning, exploration, development and construction to operations, sale, transport, export, and finally decommissioning. This can best be achieved in a coordinated way with the interaction of all players involved, and the NUI has become the vehicle of choice to accomplish this.

VISION

To be Namibia's leading source of advocacy, training and research on uranium related issues.

MISSION

To support the Namibian uranium exploration, mining and export industry through the continuous development of health, environmental and radiation safety best practices, accessible research, training and social responsibility.

VALUES

- Integrity: dignity, honesty, fairness
- Transparency: information, trust, clarity
- Accountability: responsibility, teamwork, leadership, engagement
- Compliance: both nationally and internationally



2 Committees and Working Groups of the Namibian Uranium Institute

2.1 The Sustainable Development Committee

A so-called Sustainable Development (SD) Committee was launched by NUA in 2013 in order to assist the uranium industry in upholding its reputation as a safe and responsible industry. The committee was also established to assist NUA in promoting best practices with regard to Health, Environment and Radiation Safety and Security and in its oversight responsibilities by reviewing, monitoring, and when appropriate, advising NUA from a uranium industry-wide perspective. The SD Committee reviews procedures and guides NUA members to ensure that principles of sustainable development are incorporated into the policies that drive the performance of the industry. The guiding principle of sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Sustainable development recognises the interdependence of environmental, social and economic systems and promotes equality and justice through people empowerment and a sense of global citizenship.

The SD Committee's duties include the assessment and monitoring of all risks associated with health, environment and radiation safety and security matters of the uranium industry; assistance with the development and implementation of internal compliance and control systems and procedures to manage risks; coordination of assessment and monitoring of the effectiveness of controls instituted; and the review and making of recommendations to the NUA in relation to risk management. Namibian uranium mining companies subscribe to the International Council on Mining and Metals' (ICMM) interpretation of sustainable development for the mining and metals sector, namely that investments should be technically appropriate, environmentally sound, financially profitable and socially responsible. Best practice, i.e. setting standards of operation and practice that maintain international standing and reputation is applied as it is

critical for any mining company to gain and maintain its "social license to operate" in the community. It is essential to integrate environmental, economic and social aspects through all phases of mineral production from exploration to construction, operation and finally mine closure. The SD Committee plays an important role in ensuring such best practise. In order to achieve its goals, the SD Committee has also appointed four working groups, namely the Services Working Group, the Radiation Safety Working Group, the Water and Air Quality Working Group, and the Swakop River Farmer's Working Group.

During the course of 2019, the SD Committee monitored the compilation of the SEMP report, addressed the continuity of water and air quality monitoring, investigated potential cooperation with the Hospitality Association of Namibia (HAN), and embarked upon the development of fact sheets about the industry and related matters for the information of stakeholders. Other issues addressed include waste management, assistance to the small scale mining sector and the sustainability of the West Coast Safety Initiative. Meetings with the Ministry of Environment and Tourism, including with the new chief warden at Ganab, Namib-Naukluft Park, facilitated the good cooperation between both entities. The committee also received regular feedback from the Rössing health study, and the NUI director serves as the secretary of the External Advisory Committee of this study. On a regular basis, the SD Committee and its Working Groups investigated risks and any potential issue which could negatively affect Sustainable Development.

Members of the Sustainable Development Committee

- Frances Anderson, Chair (Langer Heinrich Uranium)
- Carlene Binnemann (Swakop Uranium)
- Werner Ewald (Bannerman Resources)
- Martin Hirsch (Reptile Mineral Resources and Exploration)
- Dr Katrin Kärner (Reptile Mineral Resources and Exploration)
- Sandra Müller (Orano Mining Namibia)
- Kaarina Nkandi (Orano Mining Namibia)
- Martinus Prinsloo (Bannerman Resources)
- Dr Bertram Schleicher (Rössing Uranium Ltd)
- Rainer Schneeweiss (Rössing Uranium Ltd)
- Dr Gabi Schneider (NUI)
- Ignatius Shaduka (Rössing Uranium Ltd)
- Dr Herman Strauss (Medixx Namibia)

The SD Committee and its Working Groups investigate risks and any potential issue which could negatively affect Sustainable Development.



Air quality monitoring

2.1.1 Services Working Group

The Services Working Group was established to address power and water supply issues, as well as infrastructure developments and maintenance and waste management. Intermediate and long-term power supply security, the sourcing of sufficient quantities of bulk water at viable and cost-effective tariffs, waste management and transport infrastructure are the key issues this Working Group is dealing with. During 2019, the Services Working Group considered the conditions of the roads in the region with a special emphasis on the number and causes of accidents, the harmonizing of traffic during shift changes of the various operations, the Walvis Bay hazardous waste disposal site, the planned NamWaste hazardous waste disposal site, the state of the Omdel aquifer, and the lack of cell phone coverage on the C28. The Working Group was given a presentation on the sustainability of the current electricity supply by Nampower, and the Walvis Bay Corridor Group informed the Working Group about their activities. Regular feedback was received from the Erongo Regional Road Safety Forum.

Members of the Services Working Group

- Anca Burger, Chair (Rössing Uranium Ltd)
- Jessica Bezuidenhout (Marenica)
- Frances Anderson (Langer Heinrich Uranium)
- Werner Ewald (Bannerman Resources)
- Martin Hirsch (Reptile Mineral Resources and Exploration Ltd)
- John Kandjungu (Reptile Mineral Resources and Exploration Ltd)
- Sandra Müller (Orano Mining Namibia)
- Tinus Prinsloo (Bannerman Resources)
- Hennie Steyn (Swakop Uranium)
- Dr Gabi Schneider (NUI)



Walvis Bay harbour, from where Namibian uranium is shipped

2.1.2 Radiation Safety Working Group

Uranium mining has the potential to contaminate the environment and to affect the health of workers and the public by exposing them to ionising radiation. Radiation safety in the Namibian uranium mining industry is addressed by skilled professionals who competently manage radiation safety in the workplace and in the environment affected by uranium mining. Effective radiation protection guarantees minimal harm from ionising radiation to people and the environment. A structured uranium product stewardship program ensures that public fears about radiation are addressed factually and unemotionally. The Radiation Safety Working Group addresses the challenges associated with building and maintaining capacity in radiation safety in Namibia, and comprises members from exploration companies and the operating uranium mines in Namibia. The Working Group identifies issues relating to radiation protection that may potentially pose a risk to the industry; develops and promotes best practice guidelines for radiation protection in the uranium mining industry; suggests initiatives to promote awareness about radiation protection; and supports NUA in its initiatives towards building capacity in radiation protection.

During the course of 2019, the Working Group was involved in the re-opening and quality assurance of the Trace Element Laboratory (TEA-Lab), it addressed the SEMP air quality study, the disposal of disused sealed sources, a directive from the Ministry of Health and Social Services concerning uranium in urine testing, and legislation proposed by the National Radiation Protection Authority. Regular feedback on the Rössing Health Study was given to the members of the Working Group, and NUI continued to assist the Ministry of Mines and Energy's Geological Survey of Namibia with its radon monitoring programme.

Members of the Radiation Safety Working Group

- Temwani Kayira, Chair (Langer Heinrich Uranium)
- Frances Anderson, (Langer Heinrich Uranium)
- Jessica Bezuidenhout (Marenica)
- Nelao Endjala (Rössing Uranium Ltd)
- Efraim Ihemba (Swakop Uranium)
- Werner Ewald (Bannerman Resources)
- Laurencia Mungunda (Reptile Mineral Resources and Exploration Ltd)
- Kaarina Nkandi (Orano Mining Namibia)
- Martinus Prinsloo (Bannerman Resources)
- Dr Bertram Schleicher (Rössing Uranium Ltd)
- Dr Gabi Schneider (NUI)
- Adrian van der Merwe (Swakop Uranium)
- IZhang Xiaoke (Swakop Uranium)



The new TEA Lab

2.1.3 Water and Air Quality Working Group

The Water and Air Quality Working Group was established to address any negative impacts that the uranium operations may have and the avoidance and monitoring of such, if any. The Working Group assists NUA members in promoting and sharing leading practices and transferring knowledge with regard to water and air quality management. It advises NUA and NUI from an industry-wide perspective. The Working Group also provides an opportunity to discuss and examine water and air quality related risks and advises the Sustainable Development Committee on the co-ordination and prioritization of water and air quality risk management issues. The Working Group also encourages and fosters greater awareness of water and air quality risk management aspects at all levels in the uranium industry, which calls for the understanding of pressing issues and their effects in the longer term.

During the course of 2019, the Water and Air Quality Working Group addressed the Khan-Swakop River Groundwater Model, the regional water database, the air quality study and its continuity, the status of the Omdel aquifer, sustainability of water supply from NamWater, ambient air quality in Swakopmund during east wind conditions, the purchase of a high volume dust sampler for the monitoring of air quality, and the establishment of a Basin Management Committee for the lower Swakop River. The Working Group visited the NamWater installations, as well as the municipal sewerage plant outside Swakopmund, and planned a Water Symposium to be held in 2020. A training programme was compiled, and one member is presenting a lecture at every meeting in order to build capacity. The working group contributed significantly to the compilation of the 2018/19 SEMP report, and maintains a close working relationship with the Ministry of Mines and Energy's Geological Survey of Namibia.

Members of the Water and Air Quality Working Group

- Sandra Müller, Chair (Orano Mining Namibia)
- Frances Anderson (Langer Heinrich Uranium)
- Jessica Bezuidenhout (Marenica)
- Carlene Binneman (Swakop Uranium)
- Michael Binneman (Swakop Uranium)
- Stefaans Gaeseb (Rössing Uranium Ltd)
- Martin Hirsch (Reptile Mineral Resources and Exploration Ltd)
- Julia Kamatoto (Rössing Uranium Ltd)
- John Kandjunga (Reptile Mineral Resources and Exploration Ltd)
- Vistorina Nangolo (Rössing Uranium Ltd)
- Kaarina Nkandi (Orano Mining Namibia)
- Martinus Prinsloo (Bannerman Resources)
- Rainer Schneeweiss (Rössing Uranium Ltd)
- Dr Gabi Schneider (NUI)
- Ilka Schroer (Swakop Uranium)
- Ignatius Shaduka (Rössing Uranium Ltd)



Water and Air Quality Working Group visit to the Swakopmund sewerage plant

2.1.4 Swakop River Farmer's Working Group

The Swakop River Farmer's Working Group is a special interest group that deals with NUI's stakeholders farming in the Swakop River valley downstream of the mining operations. Farming in the immediate vicinity of mining operations can potentially lead to conflicting situations, such as competition for water, or concerns about the water quality. Indeed, the Swakop River farmers utilise a source of groundwater for their irrigation schemes, which is also utilised to a certain, albeit small extent by the uranium mines, and a coordinated approach is therefore required. Meetings are held to give information about projects and mining operations to the farmers, as well as availing them an opportunity to raise any concerns they might have.

Matters addressed in 2019 included the air quality study undertaken by the Geological Survey of Namibia, the groundwater balance model, road conditions, the Rössing health study, the possible establishment of a basin management committee for the lower Swakop River, and poaching.

Research of the reason for low infiltration rates, which have been observed by the farmers ever since the water supply includes desalinated water, was conducted in cooperation with NUA's Scientific Committee and the Namibian University of Science and Technology (NUST). Water and soil samples were taken and analysed at NUST. The study is ongoing and further sampling will take place during 2020.

The NUI's Communication Technical Advisory Committee (CTAC) assisted the Swakop River Farmer's Working Group with the development of a communication strategy to promote the quality of products from the Swakop River Valley

and spread the message that the water used for irrigation is safe and monitored regularly.

Members of the Swakop River Framers Working Group

- Rainer Schneeweiss, Co-Chair (Rössing Uranium Ltd)
- Valereis Geldenhuys-Venter, Co-Chair (Farm Owner)
- Frances Anderson (Langer Heinrich Uranium)
- Elbe Becker (Gobabeb/NERMU)
- Carlene Binneman (Swakop Uranium)
- Christine DeKlerk (Orano Mining Namibia)
- Siegfried Eckleben (Farmer)
- George Ellis (Farmer)
- Werner Ewald (Bannerman Resources)
- Hartmut Fahrbach (Farmer)
- Sandra Müller (Orano Mining Namibia)
- Norwal Mwananawa (SEMP)
- Fanie van Niekerk (Farmer)
- Tinus Prinsloo (Bannerman Resources)
- Titus Shuuja (Gobabeb/NERMU)
- Dr Gabi Schneider (NUI)
- Trudi van Rooyen (Farmer)
- Robeam Ujaha (Swakopmund Municipality)
- Dr Theo Wassenaar (Gobabeb/NERMU)



Sampling soil at a farm in the Swakop River valley

2.2 The Communication Technical Advisory Committee

The Communication Technical Advisory Committee (C-TAC) was established in order to recommend to NUI the overall strategic direction of the institute's communications. It is an advisory committee tasked to advise and assist NUA through NUI in carrying out its mission and strategic plan by developing and monitoring communication protocols, initiatives and policies, and implementing a stakeholder engagement and communication strategy for the uranium mining industry in Namibia. This strategy can be described as a roadmap that aligns communications in support of NUI's vision, goals, values and priorities, thereby enhancing performance and reputation in a measurable way. It aligns specific groups of stakeholders, internally and externally, to act in support of each of these areas. The overriding objective

of the strategy is to gain the public and stakeholders' recognition and respect as an industry that goes about its activities in a safe, environmentally-friendly and responsible manner. Other objectives are to co-ordinate communication by and between the various role players in the uranium industry; to ensure consistent communication and messages to all stakeholders; to develop a base of mutual trust and understanding with core stakeholders and key media personalities; to ensure factually correct information about the uranium industry and the uranium fuel-cycle; to address the many misconceptions about the uranium and nuclear power generation industries; to deal with negative publicity concerning the uranium industry; to highlight the socio-economic benefits of the uranium mining industry for the people of Namibia; and to create a channel of communication that encourages the public to raise any concerns they may have in connection with health, safety and the environment.



The Minister of Mines and Energy at the NUA booth during the 2019 Mining Expo

During 2019, the C-TAC dealt with marketing assistance for the SEMP report, support to the West Coast Safety Initiative, the Swakopmund International Trade Expo (SWAITEEX), and the development of fact sheets. Like every year, the C-TAC also facilitated the participation of NUA in the Chamber of Mines of Namibia Mining Expo with a joint booth of all NUA members carrying the message of our cooperation. The activities at the booth generated a lot of interest, and thereby provided a good opportunity for NUA to distribute information about the Namibian uranium industry. C-TAC also submitted NUA-related articles for publication in the Chamber of Mines of Namibia newsletter.

A major activity of the C-TAC in 2019 was the development of a communication strategy for the Swakop River Farmers Working Group. The background to this strategy is the fact that there are perceptions amongst the coastal communities that the uranium industry has a detrimental environmental effect on the Swakop River area, which leads to a potentially negative image of the fresh produce from that area. There is a lack of understanding of the local water sources and infrastructure, and sensitivities about perceived radioactive contamination of air and water exist. It was therefore important to compile key messages, identify key audiences, communication tools and formats, and ensure the relevance and scientific accuracy of the information to be communicated.

The key messages include the assurance that the Swakop River area is not affected negatively by the uranium industry in terms of air and water quality, and hence the products grown in the area are safe to consume; and the fact that the radiation in the Swakop River valley is not in any way above the normal background radiation in the area.

Members of the Communications Technical Advisory Committee

- Frieda Abraham, Chair (Swakop Uranium)
- Christine De Klerk (Orano Mining Namibia)
- Daylight Ekandjo (Rössing Uranium Ltd)
- Werner Ewald (Bannerman Resources)
- Jiang Huidi (Swakop Uranium)
- Jennet Kalomo (Swakop Uranium)
- Lourencia Mungunda (Reptile Mineral Resources and Exploration Ltd)
- Kaino Nghitongo (Rössing Uranium Ltd)
- Helena Niimbala (NUI)
- Monika Ruppel (NUI)
- Dr Gabi Schneider (NUI)
- Nanette Singh (Langer Heinrich Uranium)

3 Training

An integral part of NUI's activities is teaching in order to improve knowledge, safety and the implementation of best practises in the field of occupational health, environmental management and radiation safety. As part of its stewardship mission, NUI has developed partnerships with various service providers to develop standards, guidelines and training courses to cater for the needs of the uranium industry. NUI is also officially registered with the Ministry of Labour, Industrial Relations and Employment Creation as an Approved Inspection Authority with competencies in the fields of health, environment and radiation safety and security in terms of the Regulations made under Schedule 1(2) of the Labour Act, 2007 (Act 11 of 2007). The following courses were presented during 2019:

- Radiation Safety Officer Part 1
- Radiation Safety Officer Part 2
- Radiation Safety Officer Part 3
- RSO Refresher
- Radiation Safety for Managers
- Radiation Safety for Radioactive Sealed Sources
- Radiation Safety for Transporters
- Introduction to Radiation and Uranium for Members of the Public
- Spirometry Full Course
- Spirometry Refresher Course
- Audiometry Full Course
- Audiometry Refresher Course
- Occupational Hygiene



3.1 Occupational Hygiene Training at the Namibian Uranium Institute

NUI has partnered with Sedulitas to present internationally recognised and comprehensive quality teaching packages that are now used across the world – the Occupational Hygiene Training Organisation (OHTA) International Training Modules in Occupational Hygiene – to Namibia. Sedulitas is an Occupational Hygiene Training Association (OHTA) approved training provider. NUI and Sedulitas started with a Principles of Occupational Hygiene course in 2019. In order to afford the opportunity to as many persons as possible, the course will be repeated in 2020. The subsequent Intermediate Level courses provide practical, hands-on training, and will be presented from 2020 onwards. To streamline the OHTA examination process, the British Occupational Hygiene Society (BOHS) who administers the examinations on behalf of OHTA, introduced an online examination for the Principles of Occupational Hygiene course. The first global trial of the online examination took place during the NUI course in 2019.

The international qualifications scheme allows training participants to study occupational hygiene at individual levels, as they work towards an International Certificate in Occupational Hygiene (ICertOH). The ICertOH is an award made by an OHTA examining board on the satisfactory completion of intermediate level training modules. The syllabi for each module have been developed in partnership with the British Occupational Hygiene Society (BOHS), and in consultation with the Australian Institute of Occupational Hygienists (AIOH), the American Industrial Hygiene Association (AIHA), the American Board of Industrial Hygiene (ABIH) and other International Occupational Hygiene Association (IOHA) member organisations and NAR examining boards. The core subjects include measurement of hazardous substances, noise measurement and effects, control of hazardous substances, and health effects of hazardous substances.



The first ever OHTA online examination at the NUI



Participants of the Occupational Hygiene course

4 The Strategic Environmental Management Plan for the Namibian Uranium Province

Thirteen years ago, when prices for fuel for civil nuclear reactors were rising fast, resulting in a worldwide boom in uranium exploration and mining, the Namibian uranium industry recommended to the Namibian Government to undertake a Strategic Environmental Assessment (SEA) of the Namibian uranium province, where exploration for uranium was also expanding rapidly. Subsequently, such an assessment was carried out by the Ministry of Mines and Energy's Geological Survey of Namibia, and provided vision and generated a culture of cooperation between the uranium mining industry, government and the public. The Strategic Environmental Management Plan (SEMP) was developed as a result of the SEA. It is an overarching framework and roadmap addressing the cumulative impacts of existing and potential developments and the extent to which uranium mining is impacting the central Namib. The SEMP has 12 themes, the so-called Environmental Quality Objectives (EQOs), each articulating a specific goal, providing context, setting standards and having a number of key indicators that are monitored. These themes include socio-economic development, employment, infrastructure, water, air quality, health, effect on tourism, ecological integrity, education, governance, heritage and future, and mine closure and future land use. Each EQO has a number of indicators that are assessed and placed into 4 categories, namely "met", "in progress", "not met" and "exceeded". NUI has been actively contributing to the compilation of the annual SEMP reports. Since the low uranium price for an extended period of time has led to a substantial slowing down of activities, it was decided to change the mode to biannual reports, and the 2018/19 report will be launched in 2020.

Under the SEMP, the Geological Survey of Namibia completed in 2019 a study on advanced air quality management for the Erongo Region, which was done to determine the current state of air quality and update the

radiation exposure dose assessment which was previously undertaken during the SEA, and determine the main contributing sources to the atmospheric concentrations of pollutants and identify, if required, management measures that will result in ambient air quality improvements. NUI actively participated in the study and supported the radon measurement activities. The results of the study showed that the sources of emissions identified include current mining operations, exploration activities, roads and natural exposed areas prone to wind erosion. The main contributing source to PM10 concentrations are background dust from windblown surfaces and ocean spray. PM10 concentrations exceeded the WHO annual average guideline of 30 $\mu\text{g}/\text{m}^3$ at Swakopmund (36 $\mu\text{g}/\text{m}^3$), Walvis Bay (42 $\mu\text{g}/\text{m}^3$), but were below the guideline at all other measuring stations. However, these high PM10 concentrations were recorded during abnormal weather events (east wind) and also due to the presence of sea salt at the coast. Total average public exposure dose from background and measured radiation amounts to approximately 1.4 mSv/a. Annual average radon concentrations were 0.1 mSv/a at Walvis Bay, 0.2 mSv/a at Swakopmund, and 0.4 mSv/a at Arandis compared to the world-wide average public exposure of 1.1 mSv/a. The maximum estimated for the inhalation exposure from dust amounted to 0.003 mSv/a, which is half of the international inhalation dose of 0.006 mSv/a.

The contribution of both radon and ambient radioactive dust to the public exposure dose in the Erongo Region does hence not constitute a public health risk. NUI and the Geological Survey of Namibia have continued their cooperation to ensure that monitoring of dust and radon is sustained after the end of the project.



The Namibian national plant Welwitschia mirabilis occurs in abundance in the uranium province

5 Stakeholder Interaction and Cooperation

Effective and regular communication is essential for every organisation, but is especially true for the uranium industry, where factual information and transparency are crucial. There is thus a continuous interaction with NUA members, the Namibian government, local communities, the Namibian Chamber of Mines, NGOs, academic institutions and international partners such as the World Nuclear Association and the International Atomic Energy Agency (IAEA). In support of local development, the NUI provides secretarial services to the Erongo Development Foundation (EDF) and hosts the EDF board meetings. Regular interaction with the Regional Governor takes place, and water and corporate social responsibility are central points of this interaction. NUI also serves on two bodies under the Erongo Regional Council, namely the Erongo Region Road Safety Forum and the Erongo Regional Disaster Risk Management Committee. Presentations were provided for the Japanese International Cooperation Agency (JICA), the Centre for Global Education, Furman University, USA, students from the Department of

Mining and Process Engineering of the Namibian University of Science and Technology, the Embassies of Finland and Germany, and the Namibian-French Business Association. Furthermore, the NUI Director participated by invitation in the Uranium 2019 Conference of the Australasian Institute of Mining and Metallurgy (AusIMM) and presented on “The Namibian Uranium Association, the Environment and Sustainable Development”; in the Congress of the South African Society of Occupational Medicine with a paper on “Management of Hazardous Substances for Beneficial Use: The Case of Uranium”; in a workshop of the International Atomic Energy Agency in Nanchang, China, on Deploying Technology and Management of Sustainable Uranium Extraction Projects, where she presented a paper on “Uranium in Namibia, the Namibian Uranium Association and the Namibian Uranium Institute”; and in the Woman in Mining Conference, where participants were addressed on “Working with the Chamber of Mines in Uplifting Woman in Mining”.



The Finnish Ambassador visiting the NUI

5.1 World Nuclear Association

The World Nuclear Association is the international organization that represents the global nuclear industry. Its mission is to promote a wider understanding of nuclear energy by producing authoritative information, developing common industry positions, and contributing to the energy debate. The membership of the World Nuclear Association encompasses virtually all of the world's uranium mining, conversion, enrichment and fuel fabrication companies; all major reactor vendors; nuclear utilities providing 70% of world nuclear generation; major nuclear engineering, construction, and waste management companies, research and development organisations; and companies providing international services in nuclear transport, law, insurance, brokerage, industry analysis and finance. NUA is a member of the World Nuclear Association (WNA), and NUI represents NUA at the different fora of WNA. In particular, NUI is a participating member of the Fuel Report Working Group, the Radiological Protection Working Group, the Transport Working Group, and the Waste Management and Decommissioning Working Group.

5.2 Nuclear Suppliers Group

The Nuclear Suppliers Group (NSG) is a group of nuclear supplier countries that seeks to contribute to the non-proliferation of nuclear weapons through the implementation of two sets of Guidelines for nuclear exports and nuclear-related exports. The NSG Guidelines also contain the so-called "Non-Proliferation Principle," adopted in 1994, whereby a supplier, notwithstanding other provisions in the NSG Guidelines, authorises a transfer only when satisfied that the transfer would not contribute to the proliferation of nuclear weapons. Namibia recognizes the Nuclear Suppliers

Group as a key role player in mapping the direction of the nuclear industry and guiding policy decisions of major international suppliers within the nuclear fuel cycle. In recognition of its role as a major supplier of uranium, Namibia has decided to apply for membership in order to promote and safeguard the country's interests. The NUI Director represents NUA, as well as the Chamber of Mines of Namibia on a Working Group of the Ministry of International Relations and Cooperation (MIRCO), which was tasked to compile a dossier for application for membership of NSG. This collaboration between industry and MIRCO is an excellent example of the mutual assistance and good relations between the Namibian uranium sector and the Namibian Government. The dossier was completed in 2019, and further steps will be taken in 2020.





Environmental Management at Rössing Uranium

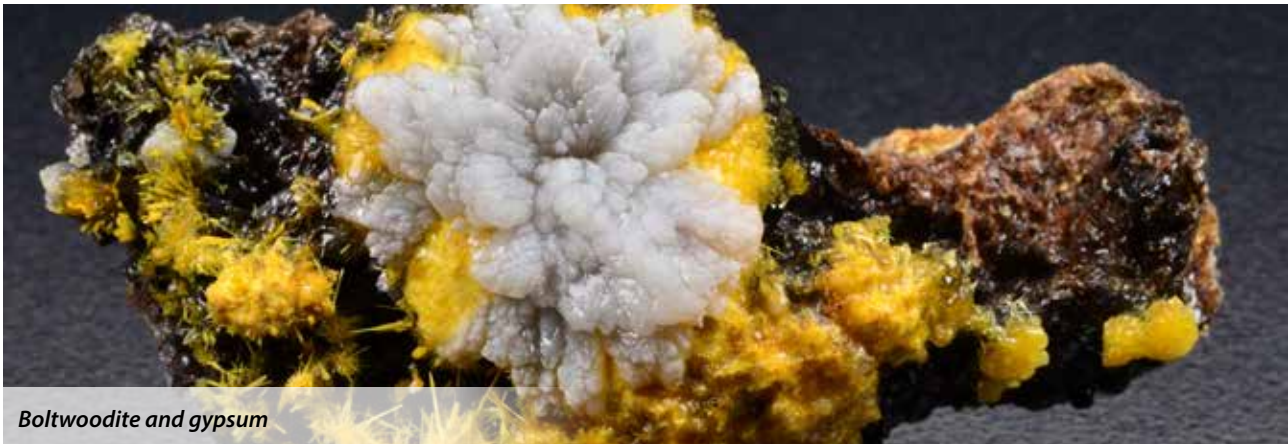
6 Conclusion

2019 was once again not an easy year for the uranium exploration and mining fraternity, as the hoped for uranium price increase did not materialise. Nonetheless, the nuclear power industry had a good year, with its output exceeding 2011 levels and the forward outlook strengthened. Nuclear electricity generation in China alone went up by 18.1% in 2019. As stated by the US Department of Energy, the US nuclear industry had its best year ever in 2019, as it led the world in generating more than 809 TWh of electricity.

Electricity is central to our life today, and demand has grown steadily for more than 100 years. At the same time, the international community recognizes the urgent need to de-carbonize electricity generation to protect people and the planet from the dangers of air pollution and climate change. Nuclear energy is a readily available and proven technology, making it an important tool for reducing carbon emissions from electricity generation. According to the OECD Nuclear Energy Agency, a mix relying primarily on nuclear is the most cost-effective option to achieve the de-carbonization

target of 50 g CO₂ per kWh. To meet the growing demand for sustainable energy, nuclear needs to provide at least 25% of electricity by 2050 as part of a clean and reliable low-carbon mix and to achieve this, nuclear generation would have to triple globally by 2050.

It is therefore anticipated that the drive for cleaner energy will increase the demand for uranium, and the Namibian uranium industry, including the two mines on care and maintenance, is positioning itself for a time with improved markets. The NUI is uniquely placed to assist the industry in this endeavour, and in meeting the national and international requirements, as well as environmental and socio-economic challenges, through transparent consultation with all stakeholders, and continuous improvement. As NUI continues to support the existing operations, we are also ready to assist a growing uranium exploration and mining community as we promote knowledge and capacity building in specialised skills in the field of environmental management, radiation safety and health.



Boltwoodite and gypsum