



# Annual Review 2016

## TABLE OF CONTENTS



## Always learning, always improving the way we work

### Namibian Uranium Institute

P.O. Box 2747, Swakopmund 9000, Namibia Tel: +264 (64) 402393, Fax:+264 (64) 402394, E-mail: director@namibianuranium.org Website: www.namibianuranium.org

	Foreword		2
	1 The History of the Namibian Uranium Institute.   2 Committees and Working Groups of the Namibian Uranium Institute   2.1 The Sustainable Development Committee		
		2.1.1 Services Working Group	8
		2.1.2 Radiation Safety Working Group	9
		2.1.3 Water and Air Quality Working Group	11
		Water Balance Model for the Khan and Swakop Rivers	12
		Water Quality Monitoring Study	13
		Advanced Air Quality Management Study	13
		2.1.4 Swakop River Farmer's Working Group	14
	2.2 The Communication Technical Advisory Committee		
	4 Training		18
	5 Stakeholder Interaction and Cooperation		
	6 Conclusion		20

## FOREWORD



The Namibian Uranium Institute (NUI) was established as part of the stewardship mission of the Namibian Uranium Association (NUA). NUI is guided by respected independent scientists who serve on NUA's Scientific Committee. The main purpose of the NUI is to act as a communication hub for the uranium industry in Namibia, and to promote knowledge and capacity building in specialised skills in the fields of environmental management, radiation safety and occupational health. NUI therefore provides an opportunity for NUA members to work together to improve safety and health performance through the identification of world-class leading best practices and their implementation. As such, NUI is working closely with the Namibian Government and state agencies, and also has close ties with the Namibian University of Science and Technology.

The Erongo Region is characterized by its aridity, vast desert landscapes, scenic beauty, high biodiversity and endemism and heritage resources. It has the second largest economy of the Namibian regions, and mining plays an important part in this economy. Walvis Bay and Swakopmund are amongst Namibia's five largest towns, but at the same time, large parts of the Erongo Region, especially along the coast, are under active conservation in the form of national parks.

Most of the Namibian uranium exploration and mining activities occur in the Central Namib, an ecologically sensitive area containing parts of the Namib-Naukluft and Dorob National Parks. Mining and the associated developments are vital for the growth of the Namibian economy, and the country must therefore reconcile development objectives and mineral exploitation with environmental protection for its long-term socioeconomic growth and stability. Clearly, an integrated approach is required so that development of one resource will not jeopardize the potential of another. Such an integrated approach is facilitated and promoted by NUI.

Environmental monitoring and programmes are carried out by all Namibian uranium exploration and mining operators to assure that their footprint is as small as possible. Stringent water-saving measures, air quality monitoring, biodiversity monitoring, mitigation measures for adverse impacts and environmental training of staff are only a few examples. Dialogue with the Ministry of Environment and Tourism is maintained through our membership in this Ministry's Sustainable Development Advisory Council. Issues pertaining to Sustainable Development are further addressed by NUI's Sustainable Development Committee. Full recognition has been given to the UN 2030 Agenda for Sustainable Development with its 17 Global Goals and the African Union's Consolidated Position on these goals, and the contribution that the uranium mining sector can make towards achieving them. Closer to home we actively support the government's Harambee Prosperity Plan as a tool to make sustainable development a lasting reality in Namibia.



The Namibian uranium industry operates in a unique setting within a uranium province that hosts a variety of uranium deposits, and at the same time within an area of high conservation value. It operates in a country with untapped potential for economic growth, but also with a fair share of socio-economic challenges. In addition, international market conditions for uranium have not been favourable for an extended period of time. Despite this, the great contributions to employment creation and Corporate Social Responsibility programmes made in the face of economic challenges speak for themselves, when it comes to the unwavering commitment of the industry to the upliftment of living standards for all Namibians. The NUI is uniquely placed to support the industry meeting environmental and socio-economic challenges through transparent consultation with all stakeholders, evidence-based teaching and continuous improvement.

I thank the NUA members and board, and in particular my predecessor Dr Wotan Swiegers, and all stakeholders for their support and guidance during 2016.

Jabi Silmeide

Dr Gabi Schneider Executive Director Namibian Uranium Institute



## 1 The History of the Namibian Uranium Institute

#### 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:	informed, trust, clarity
Accountability:	responsibility, teamwork, leadership, engagement
Compliance:	both nationally and internationally

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 at all stages from planning, exploration, development and construction to operations, sale, transport and finally decommissioning. This can best be achieved in a coordinated way with interaction of all players involved, and the NUI has become the vehicle of choice to accomplish this.

## 2 Committees and Working Groups of the Namibian Uranium Institute

#### 2.1 The Sustainable Development Committee

The Trustees of the NUA resolved in 2013 to establish a Sustainable Development (SD) Committee to assist the uranium business in safeguarding 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 an uranium industry-wide perspective. At the policy level, the SD Committee reviews and guides NUA policy formation to ensure that it incorporates principles of sustainable development early in the policy formulation process. These principles include public participation, inter-generational equity, sustainable use of natural resources and public access to information. 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 through construction, operation and mine site closure. The SD Committee plays an important role in ensuring such best practise. In order to achieve this, 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.

The SD Committee is a standing committee which can appoint Working Groups to investigate any potential issue which could negatively impact on Sustainable Development.



#### Members of the Sustainable Development Committee

- Werner Ewald, Chair (Bannerman Resources)
- Frances Anderson (Langer Heinrich Uranium)
- Simon Charter (Swakop Uranium)
- Mike Leech (NUA)
- Sandra Müller (Areva Resources Namibia)
- Rainer Schneeweiss (Rössing Uranium Ltd)
- Dr Gabi Schneider (NUI)
- Dr Herman Strauss (Medixx Namibia)
- Dr Wotan Swiegers (Atomic Energy Board)
- Dr Gunhild von Oertzen (Rössing Uranium Ltd)

During the course of the year, the SD Committee dealt with issues such as the Geological Survey of Namibia's air and water quality monitoring project, the maintenance of the radon stations, biodiversity offsets, the Rössing health study, road safety and the Road Safety Council, the Strategic Environmental Management Plan for the Namibian Uranium Province, integrated water resource management, and mine closure. New risks are a standing item on the agenda of the committee.



#### 2.1.1 Services Working Group

The Services Working Group was formed to enhance the uranium mines' focus on power and water supply issues. Intermediate and long-term power supply security and the sourcing of sufficient quantities of bulk water at viable and cost-effective tariffs are the key issues addressed by this Working Group.



#### Members of the Services Working Group

- Mike Leech, Chair (NUA)
- Duncan Craib (Swakop Uranium)
- Li Feng (Swakop Uranium)
- Martin Hirsch (Reptile Uranium Namibia)
- Michael Introna (Langer Heinrich Uranium)
- Dag Kullmann (Valencia Uranium Ltd)
- Augustinus Mungunda (Bannerman Resources)
- Dr Gabi Schneider (NUI)
- Shaan van Schalkwyk (Rössing Uranium Ltd)



Members of the Working Group have been actively involved in the Ministry of Mines and Energy's process to develop a new National Energy Policy and the formulation of an Integrated Resource Plan. A joint presentation on water demand and concerns was made at a meeting organised by NamWater and hosted by the Swakopmund Municipality, in order to address future prospects of the water supply situation at the central coast.

#### 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.



#### Members of the Radiation Safety Working Group

- Dr Gunhild von Oertzen, Chair (Rössing Uranium Ltd)
- lan Marshman (Langer Heinrich Uranium)
- Sandra Müller (Areva Resources Namibia)
- Augustinus Mungunda (Bannerman Resources)
- Dr Gabi Schneider (NUI)
- Mervyn Titus (Swakop Uranium)
- Marinda Viviers (Swakop Uranium)



Consequently, the discipline of radiation safety in the Namibian uranium mining industry requires skilled professionals able to competently manage radiation safety in the workplace and in the environment affected by uranium mining. Effective radiation protection must ensure minimal harm from ionising radiation to people and the environment. This can only be achieved if adequately trained professionals manage radiation protection in the workplace. A structured uranium product stewardship program is required to ensure that public fears about radiation are addressed factually und unemotionally. The Radiation Safety Working Group was established to address the challenges associated with building and maintaining capacity in radiation safety in Namibia.

The Radiation Safety Working Group consists of members from the operating uranium mines in Namibia, as well as from exploration companies. 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.

Issues addressed during the course of the year include training (Radiation Safety Officers, Radiation Technicians, Post-Graduate Diploma in Applied Radiation Science and Technology at the Namibian University of Science and Technology); radon station monitoring; surface contamination; the availability of instrument calibration services; the alignment of annual dose monitoring requirements; data privacy; radiation emergency response procedures; new International Atomic Energy Agency (IAEA) regulations; the concept of a Radiation Safety Officer's handbook; and the potential formation of a National Radiation Protection Association.

#### 2.1.3 Water and Air Quality Working Group

The Water and Air Quality Management Working Group was established to assist the uranium operations in safeguarding their reputation as a safe and responsible industry. The Working Group assists NUA in promoting and sharing leading practices and transferring knowledge with regard to water and guality management and advises NUA and NUI from a uranium industrywide perspective. The Working Group also provides a uranium industry-wide 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 throughout the industry. It aims to encourage and foster greater awareness of water and air quality risk management aspects at all levels in the uranium industry, which calls for the identification of risks and the understanding of pressing issues and their effects in the longer term.



#### Members of the Water and Air Quality **Working Group**

- Sandra Müller, Chair (Areva Resources Namibia)
- Simon Charter (Swakop Uranium)
- Stefaans Gaeseb (Rössing Uranium Ltd)
- Martin Hirsch (Reptile Uranium Namibia)
- Delila Kalongula (Rössing Uranium Ltd)
- Julia Kamatoto (Rössing Uranium Ltd)
- Richard Kangumba (Langer Heinrich Uranium)
- Dag Kullmann (Valencia Uranium Ltd)
- Kaarina Nkandi (Areva Resources Namibia)
- Tinus Prinsloo (Bannerman Resources)
- Rainer Schneeweiss (Rössing Uranium Ltd)
- Dr Gabi Schneider (NUI)



#### Water Balance Model for the Khan and Swakop Rivers

An important aspect addressed by the Working Group in 2016 is the updating of the Water Balance Model for the Khan and Swakop Rivers. The existing model was done as part of the Strategic Environmental Assessment in 2009. In the meantime, Namibia has witnessed extraordinary rainfalls in 2011, followed by devastating drought conditions, and abstraction patterns have also changed. Taking into consideration that the alluvial aquifers of the two rivers are not homogenous, but separated into compartments created by outcropping bedrock and narrowing of the river gorge, which are not replenished on a continual basis, it became clear that an update of the existing model is required, in order to assess the impact of groundwater abstraction form the Khan and Swakop Rivers on the environment and downstream users. The updating includes a recharge assessment using an integrated basin approach and a compartment model for the whole alluvial aquifer of the lower Swakop and Khan rivers; calibration of the model with runoff records by integration of available data on runoff modelling in the Swakop Basin; and updating the model and implementation as an operational model for water management and impact assessment. The updating is financed by NUA members, carried out by SLR Environmental Consultants and will be completed in 2017.



#### Water Quality Monitoring Study

The Working Group was also involved in two studies carried out by the SEMP office of the Geological Survey of Namibia, Ministry of Mines and Energy, namely a Water Quality Monitoring study and an Advanced Air Quality Management study. Both studies are part of the implementation of the Strategic Environmental Management Plan (SEMP).

While all mines have implemented water quality management and monitoring programs, government also has an obligation under SEMP to monitor potential emanations from mine sites via aquatic pathways. For this reason 15 monitoring boreholes were drilled, and the Water Quality Monitoring study comprises sampling of these boreholes and subsequent analysis. The study will be completed in 2017.

#### Advanced Air Quality Management Study

The potential cumulative impacts of uranium exploration and mining on air guality were assessed during the Strategic Environmental Assessment (SEA) using air dispersion modelling. Data availability has improved since then, and mines have gathered air guality data at source since 2008. These data now provide a basis to update the original dispersion model. This, in turn, allows updating of the atmospheric pathway portion of the public radiation dose assessment. However, only monitoring at receptor locations will allow ensuring the public of a safe environment. The SEMP office therefore recognised the need for an overarching air quality management programme, in order to ensure that standards are met, and that mitigation measure, if required, can be implemented by the various role players in a coordinated and integrated way.

The Advanced Air Quality Management Study programme has deployed new monitoring equipment including dust samplers and meteorological equipment, in Arandis, Swakopmund, Walvis Bay and Henties Bay. The existing Radon monitoring equipment is also utilised by the programme. Data is collected on an ongoing basis, and will be used to update the air dispersion model. Based on the outcome of the modelling, the atmospheric pathway portion of the public radiation dose assessment will also be updated, if required. The programme will also establish an analytical approach to periodically quantify chemical and radiological characteristics of dust; develop air quality guidelines for the Erongo Region; and develop a regional air quality management plan. The 3-year programme started in 2016 and is carried out by Airshed Planning Professionals.



#### 2.1.4 Swakop River Farmer's Working Group

The Swakop River Farmer's Working Group was put in place in order to address concerns of this particular stakeholder group. Farming in the immediate vicinity of mining operations can potentially lead to conflicting situations, such as competition for water, to name but one example. Indeed, the Swakop River farmers utilise

#### Members of the Swakop River Framers Working Group

- Dr Wotan Swiegers, Chair (Atomic Energy Board)
- Siegfried Eckleben, Co-Chair (Farmer)
- Frances Anderson (Langer Heinrich Uranium)
- Carlene Binneman (Swakop Uranium)
- Hartmut Fahrbach (Farmer)
- Mike Leech (NUA)
- Sandra Müller (Areva Resources Namibia)
- Norwal Mwananawa (SEMP)
- Fanie van Niekerk (Farmer)
- Prof Gustav Obermair (Farmer)
- Tinus Prinsloo (Bannerman Resources)
- Dr Gabi Schneider (NUI)

a source of groundwater for their irrigation schemes, which is also utilised in part by the uranium mines, and a coordinated approach is therefore required. Of particular importance here is the quality of the water, as the irrigation schemes are downstream from the mines. 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.

During the course of this year, information on the Water Balance Model for the Khan and Swakop Rivers, the Advanced Air Quality Management Study, the Rössing Health Study and a Ph.D. study on the riparian trees of the Swakop River was presented to the farmers. Their concerns focused on the water abstraction undertaken by the mines, which is currently addressed by the Water Balance Model study.



Asparagus Farm in the Swakop River

#### 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 formulating and implementing a stakeholder engagement and communication strategy for the uranium mining industry in Namibia.

The C-TAC, which had been dormant for some time, was revived in 2016, and concentrated on the formulation of a communication strategy. 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.

Further 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 controlled, 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 address the many myths about uranium mining and nuclear power generation; to minimise negative publicity and perceptions about the uranium industry; to highlight the socioeconomic benefits of the uranium mining industry to the people of Namibia; to educate the general public about uranium mining and the uses of uranium; and to create a channel of communication that encourages the public to report observations that may affect their safety or the environment in an unacceptable manner.



The Minister of Industrialisation, Trade and SME Development, Hon. Immanuel Ngatjizeko, the Major of Swakopmund, Her Worship Pauline Nashilundo, and Constituency Councillor Juuso Kambueshe visiting the NUA booth at the Swakopmund International Trade Expo

#### Members of the Communications Technical Advisory Committee

- Sugnet Smith, Chair (Areva Resources Namibia)
- Frances Anderson (Langer Heinrich Uranium)
- Botha Ellis (Rössing Uranium Ltd)
- Werner Ewald (Bannerman Resources)
- Martin Hirsch (Reptile Uranium Namibia)
- Dag Kullmann (Valencia Uranium Ltd)

- Christal Lebusa (Bannerman Resources)
- Alwyn Lubbe (Rössing Uranium Ltd)
- Winnie Mukupuki (Swakop Uranium)
- Ailly Namupala (NUI)
- Dr Gabi Schneider (NUI)

## 3 The Strategic Environmental Management Plan for the Namibian Uranium Province

Some 10 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 Geological Survey of Namibia, Ministry of Mines and Energy, 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 over-arching 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 guality, health, effect on tourism, ecological integrity, education, governance, heritage and future, and mine closure and future land use. NUI is actively contributing to the compilation of the Annual SEMP Reports.

The 2014 SEMP Report was released at the 2016 Chamber of Mines Mining Expo. The overall perfor-

mance showed once again a slight increase over the preceding years. 58% of all indicators were met, with 33% in progress, 7% not met and 2% exceeded. 100% performance was achieved for the socio-economic development and employment indicators, with 88% of the water indicators also met. For air quality, mine closure and future land use, heritage and future, effect on tourism, ecological integrity and governance, between 52 and 75% of the indicators were met. Most of the indicators that are not met are from the infrastructure, education, and health EQOs, thereby emphasising the challenges experienced by government in meeting rising demands in these sectors. It is hoped that there will be further improvements during the next reporting period.





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 and Social Welfare as an Approved Inspection Authority in terms of the Regulations made under Schedule 1(2) of the Labour Act, 2007 (Act 11 of 2007) as an Inspection Authority with competencies in the fields of health, environment and radiation safety and security. The following courses were presented during 2016:

- Radiation Safety Officer Part 1
- Radiation Safety Officer Part 2
- Spirometry Full Course
- Spirometry Refresher Course
- Radiation Safety Winter School
- Radiation Managers Course (Areva)
- Radiation Managers Course (RUL)
- Respiratory Risk and Solution Workshop 3M
- The Essentialness of Hearing Solutions Workshop– 3M
- 2x Introduction to Radiation for Members of the Public Workshop

Eleven students were given bursaries to study for a Post-Graduate Diploma in Nuclear Science and Technology at the Department of Natural and Applied Sciences, Faculty of Health and Applied Science, Namibian University of Science and Technology (NUST). Negotiations to have NUI's courses accredited through NUST were started. Further input into educational aspects is provided through the NUI Director's position as the Chairperson of the Board of Trustees of the Namibian Institute of Mining and Technology and as a member of the Namibian Geoscience Council.



## 5 Stakeholder Interaction and Cooperation

Sustained and effective communication is essential for every organisation. This is especially true for the uranium industry, where 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. Presentations on uranium and the economy were made to the Standing Cabinet Committee on Natural Resources, the Executive Committee of the Swakopmund Town Council, the Office of the President and the Namibian branch of the National Occupational Safety Association (NOSA). NUI also participated actively in the review of the Environmental Management Act and its Regulations. The Southern African Institute for Mining and Metallurgy (SAIMM) has been assisted in the preparation of a uranium conference to be jointly hosted in Swakopmund in 2017.



The Minister of Mines and Energy, Hon Obeth Kandjoze, visiting the Langer Heinrich Mine

## 6 CONCLUSION

NUI is looking back onto a busy and eventful year, despite economically very challenging times. During the course of 2016, the uranium spot price lost 51% of its value, only to show a little recovery in December. The economic climate caused by this price decrease puts enormous pressure on the uranium industry, not only in Namibia. However, while projects are put on hold elsewhere in the world, the Namibian uranium industry has continued to position itself for the time when the price will increase again, as mineral markets have always proven to by cyclic. In addition, a very positive

sign was given at the end of the year, when the Ministry of Mines and Energy withdrew the moratorium placed in 2007 on the issuing of new uranium exploration licenses. The way is now open for renewed search for additional resources, in order to make more projects viable. The NUI stands ready to support new developments and to continue with its mission to promote knowledge and capacity building in specialised skills in the fields of environmental management, radiation safety and health.

