



Submitted to: Marenica Ventures (Pty) Ltd  
Attention: Mr. Murray Hill  
P.O. Box 90242  
Windhoek  
Namibia

## REPORT:

---

# ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN FOR A CALCITE RECOVERY SYSTEM

PROJECT NUMBER: ECC-79-658-REP-01-A

REPORT VERSION: REV 01

DATE: 15 SEPTEMBER 2025



---

**TITLE AND APPROVAL PAGE**

Project Name: Environmental and social management plan for a calcite recovery system

Client Company Name: Marenica Ventures (Pty) Ltd

Client Name: Mr. Murray Hill

Ministry Reference: APP-006540

Status of Report: Final for submission

Project Number: ECC-79-658-REP-01-A

Date of Issue: 15 September 2025

Review Period: NA

**ENVIRONMENTAL COMPLIANCE CONSULTANCY CONTACT DETAILS:**

We welcome any enquiries regarding this document and its content. Please contact:



Environmental Compliance Consultancy (Pty) Ltd  
PO Box 91193, Klein Windhoek, Namibia  
Tel: +264 81 669 7608  
Email: [info@eccenvironmental.com](mailto:info@eccenvironmental.com)

**DISCLAIMER**

The report has been prepared by Environmental Compliance Consultancy (Pty) Ltd (ECC) (Reg. No. 2022/0593) on behalf of the Proponent. Authored by ECC employees with no material interest in the report's outcome, ECC maintains independence from the Proponent and has no financial interest in the Project apart from fair remuneration for professional fees. Payment of fees is not contingent on the report's results or any government decision. ECC members or employees are not, and do not intend to be, employed by the Proponent, nor do they hold any shareholding in the Project. Personal views expressed by the writer may not reflect ECC or its client's views. The environmental report's information is based on the best available data and professional judgment at the time of writing. However, please note that environmental conditions can change rapidly, and the accuracy, completeness, or currency of the information cannot be guaranteed.

## TABLE OF CONTENTS

|          |                                                                              |           |
|----------|------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>Introduction .....</b>                                                    | <b>6</b>  |
| 1.1      | The proposed project.....                                                    | 6         |
| 1.2      | Stakeholder engagement .....                                                 | 8         |
| 1.2.1    | ESIA Screening exercise.....                                                 | 8         |
| 1.3      | Environmental regulatory requirements .....                                  | 8         |
| 1.4      | Purpose of this report .....                                                 | 8         |
| 1.5      | Management of this ESMP.....                                                 | 9         |
| 1.6      | Limitations, uncertainties and assumptions related to this ESMP .....        | 9         |
| 1.7      | Environmental assessment practitioner (EAP).....                             | 9         |
| 1.8      | Proponent of the project .....                                               | 10        |
| <b>2</b> | <b>Environmental management framework.....</b>                               | <b>11</b> |
| 2.1      | Objectives and targets .....                                                 | 11        |
| 2.2      | Organisational structure, roles and responsibilities .....                   | 11        |
| 2.3      | Workforce competency .....                                                   | 14        |
| 2.4      | Employment .....                                                             | 14        |
| <b>3</b> | <b>Communication and awareness .....</b>                                     | <b>15</b> |
| 3.1      | Internal communication .....                                                 | 15        |
| 3.1.1    | Site inspection and toolbox talks .....                                      | 15        |
| 3.2      | External communication.....                                                  | 15        |
| 3.2.1    | Environmental emergency and response .....                                   | 16        |
| 3.2.2    | Complaint handling and recording .....                                       | 16        |
| <b>4</b> | <b>Reporting, compliance and enforcement.....</b>                            | <b>18</b> |
| 4.1      | Environmental performance management.....                                    | 18        |
| 4.2      | Operational phase: environmental inspections and compliance monitoring ..... | 18        |
| 4.3      | Reporting .....                                                              | 18        |
| 4.3.1    | Non-compliance .....                                                         | 19        |
| 4.3.2    | Disciplinary actions .....                                                   | 19        |
| <b>5</b> | <b>Environmental and social management.....</b>                              | <b>20</b> |
| 5.1      | Environmental performance management.....                                    | 20        |
| 5.2      | Operational phase .....                                                      | 20        |
| 5.2.1    | Operational phase .....                                                      | 20        |
| 5.3      | Decommissioning phase.....                                                   | 26        |
| <b>6</b> | <b>Conclusion .....</b>                                                      | <b>27</b> |

|                                      |    |
|--------------------------------------|----|
| 6.1 Implementation of the ESMP ..... | 27 |
|--------------------------------------|----|

## LIST OF TABLES

|                                                                                                                         |    |
|-------------------------------------------------------------------------------------------------------------------------|----|
| <b>Table 1 – Proponents details</b> .....                                                                               | 10 |
| Table 2 - Project team roles and responsibilities .....                                                                 | 11 |
| Table 3 - Emergency contact details .....                                                                               | 16 |
| Table 4 – Environmental and social aspects, impacts, mitigation and monitoring measures for the operational phase ..... | 22 |

## LIST OF FIGURES

|                                                               |   |
|---------------------------------------------------------------|---|
| Figure 1 –Image showing existing warehouse .....              | 6 |
| Figure 2 – Locality map for the calcite recovery system ..... | 7 |

## APPENDICES

|                                                                             |    |
|-----------------------------------------------------------------------------|----|
| Appendix A – Calcite Recovery System Floor Plan and Layout.....             | 28 |
| Appendix B – Owner Consent and No Objection.....                            | 29 |
| Appendix C – Stakeholder / Neighbour Consents and No Objection Letters..... | 30 |
| Appendix D – Swakopmund Municipality Fitness Certificate .....              | 31 |
| Appendix E – Radiation Management Plan.....                                 | 32 |

## ABBREVIATIONS

| Abbreviations                 | Description                                          |
|-------------------------------|------------------------------------------------------|
| <                             | Less than                                            |
| Bq/g                          | Becquerels per gram                                  |
| CC                            | Close Corporation                                    |
| CEO                           | Chief Executive Officer                              |
| dB                            | Decibels                                             |
| EAP                           | Environmental Assessment Practitioner                |
| ECC                           | Environmental Compliance Consultancy (Pty) Ltd       |
| Elevate Uranium               | Elevate Uranium Limited                              |
| EMA                           | Environmental Management Act No. 7 of 2007           |
| EPL                           | Exclusive Prospecting Licence                        |
| EMP                           | Environmental Management Plan                        |
| ESMP                          | Environmental and Social Management Plan             |
| I&APs                         | Interested and Affected Parties                      |
| IBC                           | Intermediate Bulk Container                          |
| Ltd                           | Limited                                              |
| m                             | Metre                                                |
| m <sup>3</sup>                | Cubic metre                                          |
| mm                            | Millimetre                                           |
| ml                            | Millilitre                                           |
| mSv                           | Millisievert                                         |
| Marenica                      | Marenica Ventures (Pty) Ltd                          |
| No.                           | Number                                               |
| MEFT                          | Ministry of Environment, Forestry and Tourism        |
| Pty                           | Propriety                                            |
| RMP                           | Radiation Management Plan                            |
| U <sub>3</sub> O <sub>8</sub> | Triuranium octoxide                                  |
| <i>U-pgrade<sup>TM</sup></i>  | Uranium upgrade process developed by Elevate Uranium |

# 1 INTRODUCTION

Environmental Compliance Consultancy (Pty) Ltd (ECC) has been engaged by Marenica Ventures (Pty) Ltd (hereinafter referred to as "Marenica" or "the Proponent") to compile this environmental and social management plan for application of an environmental clearance certificate, with the Ministry of Environment, Forestry and Tourism (MEFT) for the project.

## 1.1 THE PROPOSED PROJECT

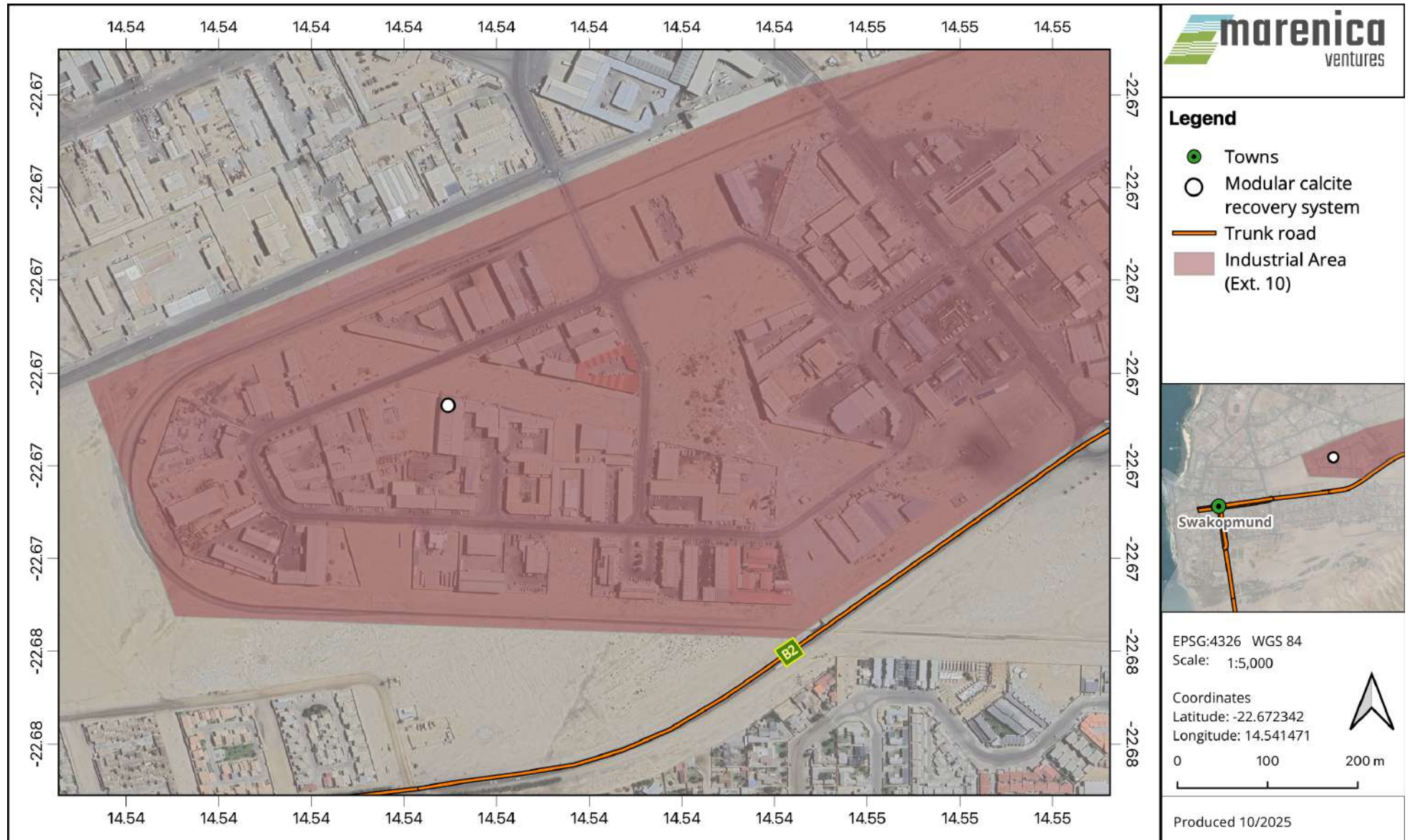
Marenica Ventures (Pty) Ltd has developed an innovative process specifically optimised for surficial calcite deposits in Namibia. To advance this, the company has manufactured a small scale fully contained calcite recovery system to test the Company's proprietary ***U-pgrade<sup>TM</sup>*** process. The system is planned to test samples from the Marenica and Koppies projects, with the actual testing period expected to run for 10-12 weeks. The contained mineral separation system is designed as a demonstration and training facility for a small Namibian workforce and will operate continuously from Monday 7 am to Friday 7 pm during the testing period. The key project activities include:

- Enclosed wet mineral separation modules (scrubbing, flotation, filtration).
- Bunded reagent and waste storage areas (110% capacity of largest vessel).
- Water storage tanks with ~10 m<sup>3</sup> total capacity.
- Assay laboratory, safety stations, and change rooms for staff.

The entire operation will be contained within the leased Unit Number 3 of the existing AJS Industrial Park, see (Figure 1) and Appendix A for the site layout plan. There will be no civil works required and no expansion of the existing footprint. The project is fully self-contained, with existing power, water, showers and toilets available for employees. Employees will be subcontracted by TEA laboratory Swakopmund. Any waste generated will be disposed of through NamWaste or another approved waste facility. The system will be housed within a 600 m<sup>2</sup> industrial shed on Bohr Street, Swakopmund as shown in Figure 2.



**Figure 1 –Image showing existing warehouse**



**Figure 2 – Locality map for the calcite recovery system**

## 1.2 STAKEHOLDER ENGAGEMENT

As part of the Project planning process and to ensure transparent communications with the interested and affected parties (I&APs), the Proponent engaged the owner of AJPS Industrial Park, Mr Andre Strauss and obtained consent for an additional use for the leased premise Unit 3, 8 Bohr St, attached as Appendix B.

In addition, the neighbouring tenants have also been consulted, neighbours' consents and no objection letters have been provided and are attached as Appendix C. Swakopmund municipality fitness certificate is also attached as Appendix D.

### 1.2.1 ESIA SCREENING EXERCISE

ECC conducted a preliminary screening exercise to assess the potential environmental and social impacts likely associated with the proposed project. The findings indicate that there will be no construction impacts as the system will be located within an existing leased building. The operational activities are expected to be minimal and low in impact.

Considering the limited scale and low-impact nature of the Project, ECC has determined that a full environmental and social impact assessment (ESIA) is not warranted at this stage. Additionally, no comprehensive studies are required, or extensive stakeholder consultation are required beyond the current engagement.

This ESMP has been developed to outline the best environmental practices and practical mitigation measures and monitoring requirements to be implemented throughout the 10–12 week project period.

The ESMP also aims to ensure that local social receptors are neither disturbed nor adversely impacted during the Project.

## 1.3 ENVIRONMENTAL REGULATORY REQUIREMENTS

The proposed Project triggers an activity listed under the Environmental Management Act, No. 7 of 2007 (EMA) and its 2012 Regulations (industrial process). Therefore, an environmental clearance certificate must be obtained from the Department of Environmental Affairs and Forestry (DEAF). In addition to this, the Project is already registered with the National Radiation Protection Authority (NRPA) and a Radiation Management Plan (RMP) (Appendix E) in place for the existing leased facility. This ESMP has been prepared in terms of the requirements of the EMA and its 2012 Regulations.

## 1.4 PURPOSE OF THIS REPORT

This ESMP provides a logical framework, mitigation measures, management strategies and monitoring requirements for the proposed Project and its associated activities. This ensures that the potential environmental impacts are curbed and minimised as far as practically possible and

that statutory and other legal obligations are adhered to and fulfilled. Outlined in the ESMP are the protocols, procedures and roles and responsibilities to ensure the management arrangements are effectively and appropriately implemented.

This ESMP is a live document and shall be reviewed at predetermined intervals, and or updated when or if the scope of work alters, when information is added or when unforeseen environmental and social impacts have been identified. All staff members and appointed contractors and their subcontractors will be legally required to comply with the requirements set out in this ESMP, once approved by the Ministry of Environment, Forestry and Tourism (the competent authority).

### 1.5 MANAGEMENT OF THIS ESMP

The Proponent will hold the environmental clearance certificate for the Project and will be responsible for the implementation and management of this ESMP. The implementation and management of this ESMP, and thus the monitoring of compliance, will be undertaken through daily duties and activities, as well as monthly inspections. All Project personnel throughout all Project phases are expected to comply with the requirements stipulated in this ESMP.

### 1.6 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS RELATED TO THIS ESMP

Where there is any conflict between the provisions of this ESMP and any contractor's obligations under their respective contracts, including statutory requirements (such as licences, Project approval conditions, permits, standards, guidelines, and relevant laws), the contract should be amended, and statutory requirements are to take precedence.

The information presented in this ESMP is based on the proposed scope of work as provided by the Proponent. When the design or operation method changes, this ESMP will need to be updated, and additional assessment may be required.

### 1.7 ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

This report has been prepared by Environmental Compliance Consultancy (Pty) Ltd (ECC) (Reg. No. 2022/0593) on behalf of the Proponent. The owner of ECC also serves as the General Manager of Marenica Energy Namibia, which is a member of the Proponent's group of companies.

The Environmental Assessment Practitioners (EAPs) responsible for preparing this report are employees of ECC. They maintain their independence and professional integrity throughout the assessment process. ECC and its employees have no material or financial interest in the outcome of this report other than fair remuneration for professional services rendered. Payment of fees is not contingent upon the results or any government decision relating to the Project.

The contents of this environmental report are based on the best available information and professional judgment at the time of compilation. However, environmental conditions are subject to change, and ECC cannot guarantee the absolute accuracy, completeness, or currency of the information presented.

All compliance and regulatory queries regarding this report should be directed to:

Environmental Compliance Consultancy (Pty) Ltd  
PO Box 91193, Klein Windhoek, Namibia  
Tel: +264 81 669 7608  
Email: [info@eccenvironmental.com](mailto:info@eccenvironmental.com)

## 1.8 PROPONENT OF THE PROJECT

The Proponents' details are provided in Table 1.

**Table 1 – Proponents details**

| Company representatives                          | Contact details:                                                                                                                                                              |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mr. Murray Hill<br>Chief Executive Officer (CEO) | Marenica Ventures (Pty) Ltd<br>P O Box 90242<br>Klein Windhoek<br><a href="mailto:murray.hill@elevateuranium.com.au">murray.hill@elevateuranium.com.au</a><br>+61 417 00 1020 |

## 2 ENVIRONMENTAL MANAGEMENT FRAMEWORK

### 2.1 OBJECTIVES AND TARGETS

To prevent and mitigate potential negative environmental and social impacts, specific environmental objectives have been developed. These are developed to ensure that all Project activities are conducted in a manner that minimise potential impacts on both the receiving environment and surrounding social receptors. The overall environmental and social objectives for the Project are as follows:

- Protect the environment and public health during setup, operation, and closure;
- Ensure effective control of radiation, waste, and chemical hazards;
- Maintain compliance with Namibian environmental legislation;
- Promote transparent stakeholder communication and safe work practices;
- Manage waste efficiently and reduce the potential for environmental pollution;
- Use natural resources effectively and efficiently; and
- Resolve complaints received from the surrounding neighbours through effective grievance resolutions mechanisms;

### 2.2 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

The Proponent shall be responsible for:

- Ensuring all staff members, appointed contractors, subcontractors and visitors comply with the procedures set out in this ESMP;
- Ensuring that all personnel receive adequate supervision, and instruction to effectively fulfil the requirements stipulated in this ESMP;
- Ensuring that any person allocated specific responsibilities is formally notified of their appointment and confirms that their responsibilities are clearly understood;
- Monitoring and evaluating the implementation of the ESMP to ensure continuous improvement and compliance throughout all phases of the Project;
- Keeping records of environmental incidents, corrective actions and induction activities for audit and reporting purposes;
- Promoting a culture of environmental awareness and accountability among all staff, contractors and visitors through ongoing communication and engagement; and
- Ensuring that contractors and subcontractors and all personnel under their employment comply with the requirements of this ESMP.

Table 2 outlines the key roles and responsibilities assigned to Project team members tasked with executing Project activities in compliance with the ESMP requirements.

**Table 2 - Project team roles and responsibilities**

| Role                                                | Responsibilities and duties                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Manager                                     | <ul style="list-style-type: none"> <li>- Report community complaints if any to MEFT</li> <li>- Ensure relevant permits and licences are obtained by the NRPA and MEFT.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Plant Manager                                       | <ul style="list-style-type: none"> <li>- Responsible for the overall management and implementation of this ESMP;</li> <li>- Develop a safety management plan to ensure that staff are adequately trained, equipped and are fully aware of potential risks in their work areas;</li> <li>- Ensure all employees are inducted;</li> <li>- Ensure site specific environmental policies are drafted/updated and communicated to all personnel;</li> <li>- Responsible for providing the resources required to effectively run operations and comply with the ESMP; and</li> <li>- Appoint all managers and supervisors required to ensure effective running of operations.</li> </ul>                                                                                                                                                                                                                                                                                                          |
| Appointed RSO                                       | <ul style="list-style-type: none"> <li>- Manage radiation protection programme and maintain all exposure records.</li> <li>- Conduct personal and area radiation monitoring.</li> <li>- Monitor air, noise, and water parameters.</li> <li>- Train staff in radiation awareness and safe material handling.</li> <li>- Report radiation incidents to NRPA and oversee corrective actions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3 <sup>rd</sup> Party RSO Expert<br>- VO Consulting | <ul style="list-style-type: none"> <li>- Identify the radiation-related requirements introduced through the Demonstration Plant at the sample storage shed at Swakopmund;</li> <li>- Describe new or additional radiation-relevant activities resulting from activities that are to take place at the Demonstration Plant, and integrate these descriptions into an updated version of Marenica's RMP;</li> <li>- Identify, describe and request feedback on radiation-related issues that must be addressed by Marenica's management prior to finalising the Updated RMP;</li> <li>- Prepare and update the current version of the RMP;</li> <li>- Undertake activities other than those listed above as may, from time to time, be requested by Marenica Energy Namibia (Pty) Ltd</li> <li>- Provide guidance on monitoring and mapping of the current work environment, to undertake a baseline gamma radiation assessment, and to calculate the exposure doses of different</li> </ul> |

| Role                                                    | Responsibilities and duties                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                         | work areas where your company undertakes radiation-relevant activities and others, as required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Shift Supervisors                                       | <ul style="list-style-type: none"> <li>- Overseeing the execution of Project activities carried out by personnel under their supervision to ensure work remain compliant to this ESMP;</li> <li>- Report any non-compliance or accidents to the plant manager; and</li> <li>- Allocating adequate resources to promote a safe and healthy working environment.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Health safety and neighbour consultation representative | <ul style="list-style-type: none"> <li>- Health, Safety, and Environment (HSE) Representative</li> <li>- Conduct environmental, safety, and occupational health inspections.</li> <li>- Lead incident investigations and ensure corrective measures.</li> <li>- Maintain compliance documentation and training records.</li> <li>- Maintain transparent communication with neighbouring tenants and the public.</li> <li>- Log and respond to complaints or concerns.</li> <li>- Coordinate community engagement meetings when required.</li> <li>- Report community feedback to the Plant Manager.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Contractors                                             | <ul style="list-style-type: none"> <li>- Comply fully with EMP and site safety procedures.</li> <li>- Provide Material Safety Data Sheets (MSDS) for all chemicals.</li> <li>- Report spills or unsafe conditions immediately.</li> <li>- Ensure waste generated by the subcontractor is managed responsibly.</li> <li>- Undertake activities in accordance with this ESMP, as well as relevant policies, procedures, management plans, method statements, licences and contract obligations;</li> <li>- Implement effective environmental and safety management measures;</li> <li>- Report environmental issues, including actual or potential environmental incidents and aspects, to the Plant manager</li> <li>- Cooperate fully with environmental inspections, audits and monitoring activities conducted by the Project manager, or regulatory authorities;</li> <li>- Ensure that employees under their employment are made aware of, and comply with the requirements of this ESMP; and</li> <li>- Ensure that appropriate corrective or remedial actions are implemented to address all environmental aspects and</li> </ul> |

| Role  | Responsibilities and duties                                                                                                                                                                                                                                                               |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | incidents. Lessons learnt should always be documented for future reference and continuous improvement.                                                                                                                                                                                    |
| Staff | <ul style="list-style-type: none"> <li>- Follow all safety and radiation control measures.</li> <li>- Wear and maintain assigned PPE.</li> <li>- Report hazards, spills, or unsafe practices to supervisors.</li> <li>- Participate in emergency drills and training sessions.</li> </ul> |

## 2.3 WORKFORCE COMPETENCY

All personnel working on the Project shall be competent to perform tasks that may cause environmental impacts. Competence refers to appropriate technical, laboratory, and labour skills, as well as relevant work experience.

The Proponent, contractors, and subcontractors shall comply with the Republic of Namibia's Regulations for Labour, Health and Safety, and any subsequent amendments. The following conditions must be met:

- Employ a competent and qualified workforce;
- Provide all personnel with necessary personal protective equipment (PPE);
- Maintain strong occupational health and safety measures throughout the Project;
- Conduct regular toolbox talks and refresher training; and
- Ensure all personnel complete an induction covering environmental awareness, safety procedures, and site-specific risks before commencing work.

## 2.4 EMPLOYMENT

The Proponent and all contractors shall comply with the Republic of Namibia's Labour, Health and Safety Regulations and any amendments relating to workforce recruitment. They shall:

- Collaborate with local authorities to ensure local communities are informed of and prioritised for job opportunities;
- Disclose the number of available positions, required skills, and qualifications;
- Specify whether positions are temporary or permanent;
- Refrain from employing foreign workers without valid residency and work permits; and
- Issue valid employment contracts detailing each employee's position, remuneration, and duties.

### 3 COMMUNICATION AND AWARENESS

To ensure potential environmental impacts are minimised, it is important that Project personnel are appropriately informed and briefed on how to properly implement the ESMP. It is also important that regular communication is maintained with stakeholders and regulatory authorities. This section outlines the framework for communication related to the implementation of the commitments that are specified in this ESMP.

#### 3.1 INTERNAL COMMUNICATION

The Project, Plant Manager and Shift supervisor(s) shall communicate environmental issues to the Project team through the following means (as and when required):

- Site induction;
- Site notices;
- WhatsApp group (or preferred social communication mobile application tool);
- Method statements and risk assessment briefings;
- Daily, weekly and monthly audits and site inspections;
- Toolbox talks, including instructions on incident response procedures; and
- Briefing on key Project-specific social and environmental issues.

This ESMP shall be distributed to the Project team including contractors and subcontractors to ensure that the environmental requirements are adequately communicated. The key activities and environmentally and socially sensitive operations must be highlighted clearly to workers and contractors. Communication among the team shall include discussion on any complaints received and actions to resolve them, results of inspections and audits conducted, any non-conformance with this ESMP, and updates on objectives or target achievements.

##### 3.1.1 SITE INSPECTION AND TOOLBOX TALKS

All personnel involved in the Project shall be inducted to the site regarding any specific environmental, social, health and safety issues. The workforce must be briefed on the observations recorded during the site inspection and risk assessment findings during toolbox talks. The workforce must demonstrate an understanding of the principles outlined in this ESMP, and the potential environmental and social impacts associated with their activities. All Project personnel must also demonstrate a clear understanding of the procedures required to control these impacts and the consequences of departure from these procedures.

#### 3.2 EXTERNAL COMMUNICATION

The General Manager together with the Project manager shall represent the Project and shall liaise with external regulatory authorities (e.g. MEFT, NRPA etc), civil society organisations and community representatives. This will ensure good working relations with the stakeholders and compliance with relevant regulations, project approved licences and permits.

### 3.2.1 ENVIRONMENTAL EMERGENCY AND RESPONSE

An emergency is any abnormal event, which demands immediate attention. It is any unplanned event, which results in the temporary loss of management control at site, but where functional resources can manage the response. An emergency response plan document will be put in place that manages the response in relation to emergencies including environmental emergencies.

Table 3 provides a list of numbers to be contacted in case of an emergency.

**Table 3 - Emergency contact details**

| Town       | Ambulance                           | Police                         |
|------------|-------------------------------------|--------------------------------|
| Swakopmund | +264 81 219 6280 or 122 from mobile | 064 415 004 or 122 from mobile |

An effective emergency management plan is crucial for the safe operation of the facility. This plan will outline clear procedures for responding to potential emergencies, such as chemical spills, radiation leaks, fires, or equipment failures. It will include detailed evacuation routes, emergency contact numbers, and designated assembly points for all personnel. Regular training and drills should be conducted to ensure that all staff are familiar with emergency protocols and can respond swiftly and effectively. The plan should also establish coordination with Swakopmund emergency services to facilitate prompt assistance and support. Additionally, communication strategies should be in place to inform stakeholders, including local communities and regulatory bodies, about any incidents and the measures being taken to address them.

### 3.2.2 COMPLAINT HANDLING AND RECORDING

Any complaints received verbally by any personnel on the Project site shall be recorded by the receiver including:

- The name of the complainant;
- The contact details of the complainant;
- Date and time the complainant was received; and
- The nature of the complaint.

The information shall be provided to the General manager and Project manager who are overall responsible for managing complaints. The Managers must address the complaints by following the these measures:

- Record the complaint in the complaint register; and
- Provide a written response to the complainant of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons why are to be recorded in the register.

The Project team and contractor employees shall be informed about the complaints register, its location and the person responsible, to refer the public who wish to lodge a complaint. The complaints register shall be kept for the duration of the Project and must be available for government or public review, upon request.



## **4 REPORTING, COMPLIANCE AND ENFORCEMENT**

### **4.1 ENVIRONMENTAL PERFORMANCE MANAGEMENT**

This section outlines the overall monitoring commitments required for implementation during the operational and decommissioning phase of the Project. It details procedures to ensure routine inspections and audits are conducted to ensure that Project's activities are aligned and remain compliant with this ESMP.

### **4.2 OPERATIONAL PHASE: ENVIRONMENTAL INSPECTIONS AND COMPLIANCE MONITORING**

An audit and inspection program must be developed to ensure effective operational performance. For example, the facility must be inspected and monitored accordingly based on a defined schedule (daily or weekly inspections). This will ensure any possible issues are detected timely and addressed. The maintenance team (i.e. artisans, handymen and mechanics) will conduct these routine inspections.

The Plant manager will conduct annual inspections of all infrastructure to ensure they are operating according to specifications and to identify any signs of deterioration. Any non-conformance will be recorded, including the following details: a brief description of non-conformance; the reason for the non-conformance; the responsible party; the result (consequence); and the corrective action taken and any necessary follow up measures required.

### **4.3 REPORTING**

All incident or non-compliance, including any environmental issue, failure of equipment or accident, is reported to the Project and Plant managers throughout the projects 10-12 week duration.

The MEFT reserves the right to require the Proponent to submit bi-annual reports evaluating the Project's compliance with the commitments that are outlined in this ESMP.

For large-scale spills (i.e., > 200 litres) and other significant environmental incidents, the fire service should be notified as required and the MEFT office should be informed of the incidents (telephone +264 61 284 2111). If the spillage is of a fuel source (i.e. petrol/diesel), the Ministry of Industrialisation, Mines and Energy (MIME) must be notified by completing form PP/11 (telephone: +264 61 284 8111). Notification should occur no later than 48 hours after the incident has occurred.

For the clean-up of smaller spills, the relevant material safety data sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic spill response training will be provided as part of the site environmental induction, spill response equipment, including relevant

MSDS copies, will be provided in areas where potentially environmentally hazardous chemicals may be used.

Occupational incidents and accidents incurred on site should be reported to the authorities (i.e. Occupational Safety & Health Department) at the Ministry of Labour, Industrial Relation and Employment Creation (MLIREC), by using form F.5.

All correspondence and communication with local and regulatory authorities should be undertaken by the General Manager or Project manager.

#### 4.3.1 NON-COMPLIANCE

Where it has been identified that activities are not compliant with this ESMP, the Project manager must ensure that corrective actions are implemented to the extent that the activities return to being compliant as soon as possible. In instances where the requirements of the ESMP are not upheld, a non-conformance and corrective action notice will be produced. The notice will be generated during the inspections and the plant manager will conduct follow ups to determine whether the corrective actions are implemented as planned and instructed.

A non-compliance event / situation is considered if:

- There is evidence of contravention of this ESMP and associated indicators or objectives;
- The contractors or subcontractors have failed to comply with corrective actions or other instructions issued to them by the project manager, plant manager or qualified authority;
- or
- There is evidence of negligence in recording, investigating and responding to community complaints through the established reporting channels and grievance resolution mechanisms.

Work will be stopped in the event of a non-compliance, until corrective action(s) has been completed. The non-compliance will be closed out once the Project or Plant manager has inspected the corrective action and confirmed that the issue has been satisfactorily resolved.

#### 4.3.2 DISCIPLINARY ACTIONS

This ESMP is a legally binding document. Non-compliance with its provisions may result in disciplinary and/or legal action(s) against the responsible party or parties. These actions may include, but not limited to the following:

- Legal actions in accordance with other applicable environmental and labour laws;
- Imposition of monetary fines or penalties on contractors or subcontractors;
- Termination of contractual agreements with contractors, subcontractors or suppliers;
- Requirement for immediate corrective or remedial actions at violator's expense;
- Suspension or withdrawal of the Project approved licences and permits;
- Complete or partial suspension of Project activities until compliance is restored; or
- Disqualification from participating in future Project activities.

## 5 ENVIRONMENTAL AND SOCIAL MANAGEMENT

### 5.1 ENVIRONMENTAL PERFORMANCE MANAGEMENT

Table 4 provides the overall management plan of potential impacts of the Project during the operational phases. These plans provide mitigation and monitoring commitments, as well as the roles responsible for execution. The Project manager and Shift supervisor(s) will use the management plan to undertake daily, weekly and monthly inspections to ensure the Project remain compliant with this ESMP.

This ESMP has been developed to provide guidance to the project personnel, contractors and subcontractors through the different phases. This includes the following:

- **10-12 week operational phase:** the undertaking of activities in accordance with industry best practices. Emphasis is placed on environmental protection and social responsibility to ensure minimal environmental disturbances and reduce impacts on neighboring tenants;
- **Decommissioning phase:** systematic cessation of operations including implementing after-care measures following cessation of project operations.

### 5.2 OPERATIONAL PHASE

This section outlines the management, mitigation and monitoring measures to be implemented during the daily operation and management of the project and its associated activities. All operational activities should be guided by the following principles:

- To manage operations and activities in ways that minimise disturbance to the surrounding community and environment;
- To encourage and enforce environmentally responsible behaviours amongst staff and contractors;
- To conform best practices;
- To foster partnership with community stakeholders; and
- To actively collaborate with regulatory authorities and stakeholders by maintaining open communication and ensuring full compliance with all Project-approved permits, licences and their conditions.

The specific environmental management measures and monitoring requirements required for implementation during the operational phase are discussed in Table 4.

#### 5.2.1 OPERATIONAL PHASE

Radiation levels will be monitored to ensure that employee exposure does not exceed 20 mSv per annum averaged over 5 years, with a maximum limit of 50 mSv in a single year. Dust will be managed by operating with wet materials and using a dust extraction system and dust masks. Access to the site will be restricted to trained personnel, and all radioactive materials will be stored in sealed containers.



Table 4 – Environmental and social aspects, impacts, mitigation and monitoring measures for the operational phase

| Aspect             | Potential Impact                | Significance |
|--------------------|---------------------------------|--------------|
| Radiation exposure | Worker overexposure             | Low          |
| Water and effluent | Contamination from leaks/spills | Low          |
| Air quality        | Dust or radon release           | Low          |
| Waste generation   | Low-level radioactive waste     | Moderate     |
| Noise              | Equipment noise                 | Low          |
| Social             | Local employment and engagement | Positive     |

| Aspect                            | Potential impact                                                                                                           | Management and mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Monitoring requirement                                                                                  | Responsibility                                                                                                                     |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Operational phase</b>          |                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                         |                                                                                                                                    |
| Radiation exposure and management | - Worker and public exposure                                                                                               | <ul style="list-style-type: none"> <li>- Apply and comply with provisions from the 2025 RMP Update:</li> <li>- Monthly personal dosimetry.</li> <li>- Weekly area gamma/radon surveys.</li> <li>- Maintain exposure below 20 mSv per year (5-year average) and 50 mSv max/year.</li> <li>- Keep all operations wet to limit dust and radiation spread.</li> <li>- Store any material &gt; 1 Bq/g in sealed, labelled containers for licenced disposal.</li> <li>- As the facility is closed and a private facility with security ensure that public access is prevented for safety and security.</li> </ul> | <ul style="list-style-type: none"> <li>- Daily</li> <li>- Weekly (10-12 week project period)</li> </ul> | <ul style="list-style-type: none"> <li>- Project and plant manager</li> <li>- RSO and 3<sup>rd</sup> Party RSO expert.</li> </ul>  |
| Waste and Wastewater              | <ul style="list-style-type: none"> <li>- Contamination from leaks/spills</li> <li>- Low-level radioactive waste</li> </ul> | <ul style="list-style-type: none"> <li>- Approximate outputs:</li> <li>- ~33 t of -12+0.125 mm at 80% solids. ~30 ppm U3O8 (~0.42 Bq/g).</li> <li>- ~8 t of 40% thickened slurry or filter cake. ~5 ppm U3O8 (~0.07 Bq/g).</li> <li>- ~13 t of calcite float concentrate as a 50% slurry or filter cake. ~70 ppm U3O8 (~1 Bq/g).</li> <li>- ~7 t of float tail as a 50% slurry or filter cake. ~70 ppm U3O8 (~1 Bq/g).</li> </ul>                                                                                                                                                                           | <ul style="list-style-type: none"> <li>- Daily</li> <li>- Weekly</li> <li>- Monthly</li> </ul>          | <ul style="list-style-type: none"> <li>- Project and plant managers</li> <li>- RSO and 3<sup>rd</sup> Party RSO expert.</li> </ul> |

| Aspect                   | Potential impact | Management and mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Monitoring requirement | Responsibility |
|--------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|
| <b>Operational phase</b> |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                        |                |
|                          |                  | <ul style="list-style-type: none"> <li>- ~0.1 t PPE &amp; waste drum. ~30 ppm U3O8 (~0.42 Bq/g).</li> <li>- ~0.2 t waste solids drum. ~30 ppm U3O8 (~0.42 Bq/g).</li> <li>- ~0.1 t bag house solids drum. ~30 ppm U3O8 (~0.42 Bq/g).</li> <li>- All waste products will be stored in sealed drums, buckets, or IBCs for future testing or disposal. Materials below 1 Bq/g could be returned to the test pit, while materials above 1 Bq/g will be transported to a third-party facility for disposal. Discussions with the Husab Uranium Project are ongoing for waste acceptance. All water will be assayed for uranium and heavy metals before disposal or collection by a third party.</li> <li>- Store solids in sealed drums or IBCs; recycle <math>\geq 90</math> % of process water.</li> <li>- Test effluent for uranium, metals, and pH before reuse or discharge.</li> <li>- Use approved disposal partners for radioactive residues.</li> <li>- Ensure compliance with municipal guidelines.</li> <li>- No employee may relieve himself or herself in the surrounding environment;</li> <li>- Provide clearly labelled waste bins to encourage proper waste sorting.</li> <li>- Separate waste at source into categories such as organic (food waste), recyclable (plastic, paper, metal) and non-recyclable waste.</li> <li>- A temporary solid waste storage area must be established, and waste bins must be covered and collected periodically for disposal at an approved waste disposal site.</li> <li>- The waste storage area must always be kept clean and tidy.</li> </ul> |                        |                |

| Aspect                   | Potential impact                         | Management and mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Monitoring requirement                                                                                          | Responsibility               |
|--------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Operational phase</b> |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                 |                              |
|                          |                                          | <ul style="list-style-type: none"> <li>- Once emptied, food waste bins must be cleaned, dried and returned to their designated areas.</li> <li>- Implement the waste management hierarchy: avoid, reuse, recycle, and then dispose of.</li> <li>- Maintain good housekeeping across operational areas.</li> <li>- Develop a waste inspection schedule covering all drainage systems and components of the waste to ensure malfunctions are timely detected and repaired.</li> <li>- Conduct regular training and refresher courses with the maintenance team on operational procedures and emergency protocols to ensure effective management and monitoring of the facility.</li> <li>- Report results of monitoring to regulators and staff as required.</li> </ul> |                                                                                                                 |                              |
| Air quality              | - Dust or radon release                  | <ul style="list-style-type: none"> <li>- All solids will be wetted prior to arrival at site, and all operations will be conducted wet.</li> <li>- Baghouse extraction will be utilised in the lab area when handling dry samples.</li> <li>- Personnel near dry sampling wear P2/P3 respirators.</li> <li>- Conduct quarterly air-quality and radiological checks</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>- Daily</li> <li>- Weekly</li> <li>- Monthly</li> </ul>                  | - Project and plant managers |
| Noise                    | - Nuisance noise to neighbouring tenants | <ul style="list-style-type: none"> <li>- Maintain noise &lt; 85 dB;</li> <li>- Enclose noisy equipment with soundproofing material;</li> <li>- Provide ear protection to personnel working in close proximity to loud equipment.</li> <li>- Conduct a baseline noise survey prior to operations</li> <li>- Attenuate noisy equipment</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>- Prior to operations</li> <li>- Once during the 10 – 12 week</li> </ul> | - Project and plant managers |

| Aspect                         | Potential impact                                                                                                                                                                                                                                                                | Management and mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Monitoring requirement | Responsibility |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------|
| <b>Operational phase</b>       |                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |                |
|                                |                                                                                                                                                                                                                                                                                 | - If possible, schedule noisy activities during daytime.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | operational period     |                |
| Social and community relations | <ul style="list-style-type: none"> <li>- Skills development</li> <li>- Commitment to ethical employment practices.</li> <li>- Strong working relationship with the neighbouring farming community, conservation groups, key stakeholders and regulatory authorities.</li> </ul> | <ul style="list-style-type: none"> <li>- All visitors are expected to abide by the information/notices conveyed to them;</li> <li>- Engage in general environmental awareness, skills empowering, career advancing and training;</li> <li>- The Proponent and Project manager must represent the Project by maintaining good working relations with the surrounding neighbours, external auditors and regulatory authorities;</li> <li>- The Proponent shall actively participate in conservation initiatives (such as using sea water to test if it is a viable option for other process in future to reduce the industry demand on water supply);</li> <li>- Ensure that local people are prioritised for employment opportunities;</li> <li>- Ensure resources are in place to ensure all staff participate in regular training and refresher courses to enhance their skills, knowledge and overall competence.</li> </ul> | - Ad hoc basis         | - All          |

### 5.3 DECOMMISSIONING PHASE

The decommissioning phase follows the operational phase. This section provides a site-specific plan developed to ensure that appropriate environmental and management practices are followed during the decommissioning phase of the Project. The section also outlines detailed remediation; site control and monitoring activities that will be conducted once the infrastructure are no longer required.

The decommissioning phase:

- Provide effective and implementable site-specific procedures and mitigation measures to monitor and manage environmental impacts throughout the decommissioning phase of the Project. These measures aim to minimise the likelihood and extent of post-decommissioning impacts;
- Wash all equipment and shed prior to removal of equipment. Collect and assay rinse water for uranium and heavy-metal content.
- Store solids > 1 Bq/g in sealed drums for removal to a licenced facility.
- Perform final radiological clearance and submit a Closure Report to MEFT and NRPA.

The decommission phase or site closure is yet to be determined. However, should this be required or determined for any reason, the following general conditions outlined in Table 4 shall be followed and implemented, as best practice measures.

## 6 CONCLUSION

The small scale Calcite Recovery System is a self-contained mineral separation system engineered to operate with minimal environmental and radiological risk. By following this EMP:

- Environmental, safety, and radiation risks will remain low and manageable.
- Workers and nearby stakeholders will be protected through active monitoring and communication.
- Full regulatory compliance will be maintained under Namibia's environmental and radiation laws.

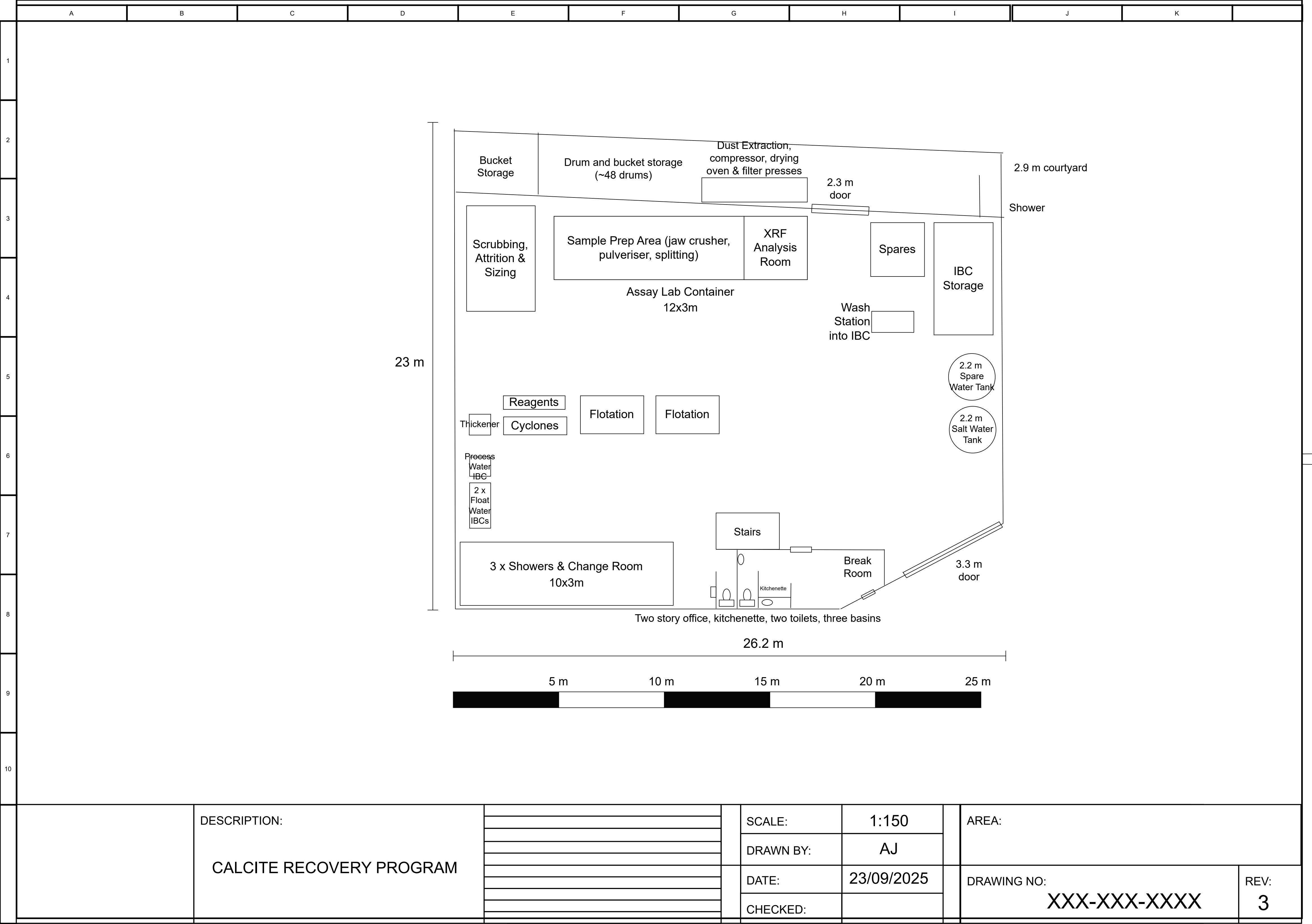
This plan demonstrates Marenica Ventures (Pty) Ltd's commitment to safe, responsible, and sustainable mineral separation operations in Namibia.

### 6.1 IMPLEMENTATION OF THE ESMP

This ESMP:

- A. Has been prepared pursuant to the contract with the Proponent;
- B. Has been prepared on the basis of information provided to ECC up to October 2025;
- C. Is for the sole use by the Proponent, employees, contractors and subcontractors during the construction and operational phase;
- D. Must not be used by any person other than (1) the Proponent (2) Contractors and subcontractors; and
- E. Must not be copied without the prior written permission of ECC.

## Appendix A – Calcite Recovery System Floor Plan and Layout



## Appendix B – Owner Consent and No Objection

---

**RE: Lease Agreements, Phase 3 Power, additional shower & Additional use**

---

**From** Andries JP Strauss <ajps@iway.na>

**Date** Mon 7/07/2025 5:59 PM

**To** Jessica Bezuidenhout <jessica.bezuidenhout@elevateuranium.com.au>

Good day Jessica

Your request is noted; André has no problem with the request.

1. With reference to the agreements

a. It is suggested to only change page 1 and page 3 items 6.1 – will it be acceptable?

Will the change of 6.1 be applicable to both agreements.

Kindly advise to finalize or call me

Kind regard,  
Annalize

---

**From:** Jessica Bezuidenhout <jessica.bezuidenhout@elevateuranium.com.au>

**Sent:** 03 July 2025 16:21

**To:** Andries JP Strauss <ajps@iway.na>

**Subject:** Lease Agreements, Phase 3 Power, additional shower & Additional use

Dear Andre,

Hope you are well.

I wanted to touch base with you on a few things and tried to phone today but I know it is tough for us with my poor Afrikaans ;-)

We have had to change the company structure because Namra didn't like the fact that accounts were being paid from the Australian account of the parent company Elevate. It was complicated by the fact invoices were made out to Marenica Energy... Anyway after many months we have finally sorted it all out and have restructured the accounts and companies.

Our lease agreement is under the name of Marenica **Energy**. However we really should change this to reflect Marenica **Ventures** please. This will also help us with the upgrade of the power to 3 phase which is being done in Marenica **Ventures** name but they have a problem with the lease being in Marenica **Energy's** name.

Also a while back I asked for the consent of the additional as our lease agreement item 6.1 states that we need to request your consent in writing if we intend to use the premise for other use.

As such we are writing to request your consent for us to add an additional 'purpose' to item 6.1 of our agreement which will include 'test work and demonstration plant' - all other items in condition 6.1 remain unchanged. Can I amend the lease agreement to include the additional use and change the lease agreement to the Marenica Ventures company name please?

Lastly we would like to have a second shower outside next to the one you built us - could you please arrange another shower to be built or would you like us to do this? I think we should also put in a geyser for the shower to please.

Otherwise I think that is everything - should you wish to have a quick call let me know.

With kind regard,

Jessica

**Jessica Bezuidenhout**

**General Manager Namibia**

**Mobile/WhatsApp:** +264 81 653 1214

**Email:** [jessica.bezuidenhout@elevateuranium.com.au](mailto:jessica.bezuidenhout@elevateuranium.com.au)



[www.elevateuranium.com.au](http://www.elevateuranium.com.au)

## **Appendix C – Stakeholder / Neighbour Consents and No Objection Letters**

## Appendix D – Swakopmund Municipality Fitness Certificate



# Municipality of Swakopmund



4104517



53

## C E R T I F I C A T E O F F I T N E S S

No 3181/2025

NAME OF BUSINESS : Marenica Ventures (Pty) Ltd

BUSINESS CATEGORY : Administrative Office

TYPE OF REGISTRATION

### Exploration Activities

NAME OF OWNER/MANAGER : J Bezuidenhout

BUSINESS ADDRESS : PO Box 90242  
Windhoek

ERF NO : 3970

STREET ADDRESS : Bohr Street

THIS CERTIFICATE EXPIRES : 31 March 2026

ISSUED ON THE FOLLOWING CONDITIONS:

1. *Subject to all relevant laws and statutory requirements.*



DATE

GENERAL MANAGER HEALTH

**N.B.** This certificate does not exempt the holder from obtaining any other documents, which are required by law (including requirements contained in the Town Planning Regulations) (G.N. 121 of 1969 as amended)



# Municipality of Swakopmund



4104517



53

## REGISTRATION CERTIFICATE

No 3181/2024

### Marenica Ventures (Pty) Ltd

is hereby registered to trade as a

Administrative Office  
Exploration Activities

NAME OF OWNER/MANAGER : J Bezuidenhout  
BUSINESS ADDRESS : PO Box 90242  
Windhoek  
ERF NO : 3970  
STREET ADDRESS : Bohr Street

**THIS CERTIFICATE EXPIRES ON 31 MARCH 2026**



DATE

GENERAL MANAGER HEALTH

N.B.:

*This certificate does not exempt the holder from obtaining any other documents, which are required by law (Including requirements contained in the Town Planning Regulations)*

## Appendix E – Radiation Management Plan

# Marenica Ventures Pty Ltd

## Radiation Management Plan, for exploration activities and the Koppies Demonstration Plant

August 2025

Submitted by:



Assisted by:



Mr Murray Hill (Legal Person & CEO)

Marenica Energy Namibia (Pty) Ltd

P O Box 91193, Klein Windhoek, Namibia

Telephone CEO: +61 8 6555 1816 (landline)

Mobile CEO: +61 417 00 10 20

Mobile GM: +264 81 653 1214

Email: [murray.hill@elevateuranium.com.au](mailto:murray.hill@elevateuranium.com.au) (CEO)

[jessica.bezuidenhout@elevateuranium.com.au](mailto:jessica.bezuidenhout@elevateuranium.com.au) (GM)

[angelika.joseph@elevateuranium.com.au](mailto:angelika.joseph@elevateuranium.com.au) (RSO)

VO Consulting

PO Box 8168

Swakopmund

Namibia

Mobile: +264 81 314 9664

Email: [info@voconsulting.net](mailto:info@voconsulting.net)

## Version Control

| Revision                      | Date          | Purpose                                                         | Internal approval                                                        | Distribution to                                                                                                                        |
|-------------------------------|---------------|-----------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Revised and updated RMP       | August 2025   | General update and incorporation of Koppies Demonstration Plant | Angelika Joseph, designated RSO<br>Jessica Bezuidenhout, General Manager | <ul style="list-style-type: none"><li>Senior management and relevant staff of Elevate Uranium Limited</li><li>NRPA</li></ul>           |
| Fully revised and updated RMP | December 2022 | submitted to NRPA                                               | Angelika Joseph, designated RSO<br>Jessica Bezuidenhout, General Manager | <ul style="list-style-type: none"><li>Senior management and relevant staff of Marenica Energy Namibia (Pty) Ltd</li><li>NRPA</li></ul> |

## PURPOSE

**This document is Elevate Uranium Limited's  
Radiation Management Plan (RMP).**

**Activities include exploration in Exclusive Prospecting License (EPL) areas <sup>1</sup> in the Erongo Region of Namibia as well as the construction and operation of a uranium extraction demonstration plant in Swakopmund.**

**The content of this RMP is based on the requirements and stipulations of the Namibian Atomic Energy and Radiation Protection Act, 2005 (Act No. 5 of 2005) [AEA, 2005], and the Radiation Protection and Waste Disposal Regulations underlying the Atomic Energy and Radiation Protection Act, 2005 (Act No. 5 of 2005) [NRPA, 2012].**

**The structure of this RMP follows the guidelines for RMPs as issued by the National Radiation Protection Authority (document no NRPA\_G\_01).**

---

<sup>1</sup> Applicable EPLs include the following: EPL 6987, 7278, 7279, 7436, 6663, 7508, 7803, 7368, 6746, 8728, 8795, 8792, 8098 and 7662, as well as Mineral Deposit Retention Licence (MDRL) 3287.

## TABLE OF CONTENTS

|          |                                                                                         |           |
|----------|-----------------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>INTRODUCTION</b>                                                                     | <b>1</b>  |
| 1.1      | BACKGROUND .....                                                                        | 1         |
| 1.2      | PURPOSE .....                                                                           | 1         |
| 1.3      | SCOPE .....                                                                             | 2         |
| <b>2</b> | <b>MARENICA VENTURES PTY LTD (MARENICA)</b>                                             | <b>3</b>  |
| 2.1      | INTRODUCTION .....                                                                      | 3         |
| 2.2      | CONTACT DETAILS .....                                                                   | 4         |
| 2.3      | MARENICAS MAIN RADIATION-RELATED ACTIVITIES .....                                       | 4         |
| 2.4      | SOURCES AND TYPES OF IONISING RADIATION OCCURRING AS PART OF MARENICA'S ACTIVITIES..... | 9         |
| 2.5      | REGULATORY THRESHOLDS .....                                                             | 11        |
| 2.6      | EXPOSURE PATHWAYS .....                                                                 | 13        |
| <b>3</b> | <b>PRE-OPERATIONAL SAFETY ASSESSMENT</b>                                                | <b>14</b> |
| 3.1      | PURPOSE AND SCOPE .....                                                                 | 14        |
| 3.2      | OVERVIEW .....                                                                          | 14        |
| 3.3      | BEST PRACTICES OF RELEVANCE TO EL8'S RADIATION-RELATED ACTIVITIES.....                  | 16        |
| <b>4</b> | <b>ORGANISATIONAL ARRANGEMENTS</b>                                                      | <b>17</b> |
| 4.1      | PURPOSE AND SCOPE .....                                                                 | 17        |
| 4.2      | ORGANISATIONAL STRUCTURE AND REPORTING LINES.....                                       | 17        |
| 4.3      | RESPONSIBILITIES OF EL8'S DESIGNATED RADIATION SAFETY OFFICER .....                     | 18        |
| 4.4      | RADIATION SAFETY OF EL8'S CONTRACTORS.....                                              | 19        |
| <b>5</b> | <b>OCCUPATIONAL RADIATION PROTECTION PROGRAM</b>                                        | <b>20</b> |
| 5.1      | PURPOSE AND SCOPE .....                                                                 | 20        |
| 5.2      | EL8'S RADIATION HAZARDS.....                                                            | 20        |
| 5.3      | EXPOSURE GROUP AND WORK AREA CLASSIFICATION .....                                       | 21        |
| 5.4      | OCCUPATIONAL EXPOSURE DOSE LIMITS.....                                                  | 23        |
| 5.5      | MONITORING EQUIPMENT .....                                                              | 24        |
| 5.6      | MONITORING OCCUPATIONAL EXPOSURE TO RADIATION.....                                      | 27        |
| 5.7      | PERSONAL PROTECTIVE EQUIPMENT (PPE) AND BEHAVIOURAL MEASURES .....                      | 28        |
| 5.8      | MANAGING OCCUPATIONAL EXPOSURE TO RADIATION AT EL8.....                                 | 30        |
| 5.9      | RADIATION-RELATED INDUCTION AND TRAINING AT EL8 .....                                   | 31        |
| 5.10     | MANAGING RADIATION-RELATED DATA AT EL8 .....                                            | 31        |
| <b>6</b> | <b>PUBLIC MONITORING PROGRAM</b>                                                        | <b>33</b> |
| 6.1      | PURPOSE AND SCOPE .....                                                                 | 33        |
| 6.2      | PUBLIC DOSE LIMITS.....                                                                 | 33        |
| 6.3      | EXPOSURE PATHWAYS OF RELEVANCE TO MEMBERS OF THE PUBLIC.....                            | 33        |
| 6.4      | MAIN PUBLIC RISKS AND RISK AREAS .....                                                  | 34        |
| 6.5      | MINIMISING THE EXPOSURE OF MEMBERS OF THE PUBLIC .....                                  | 36        |
| 6.6      | MONITORING PUBLIC EXPOSURES.....                                                        | 37        |
| 6.7      | MANAGING RADIATION-RELATED PUBLIC EXPOSURE DATA AT EL8 .....                            | 38        |
| <b>7</b> | <b>SAFETY AND SECURITY OF RADIATION SOURCES</b>                                         | <b>39</b> |

|           |                                                          |           |
|-----------|----------------------------------------------------------|-----------|
| 7.1       | PURPOSE AND SCOPE .....                                  | 39        |
| 7.2       | NORM RADIATION SOURCES UNDER EL8'S MANAGEMENT.....       | 39        |
| 7.3       | SAFE-GUARDING EL8'S SOURCES OF IONISING RADIATION .....  | 40        |
| <b>8</b>  | <b>EMERGENCY PREPAREDNESS &amp; RESPONSE PLAN</b>        | <b>41</b> |
| 8.1       | PURPOSE AND SCOPE .....                                  | 41        |
| 8.2       | MAIN RISK AREAS – ACCIDENTAL EXPOSURE TO RADIATION ..... | 41        |
| 8.3       | EL8'S EMERGENCY RESPONSE PLAN.....                       | 43        |
| 8.4       | VEHICLE ACCIDENTS INVOLVING NORM MATERIALS .....         | 44        |
| 8.5       | CLEAN-UP OF SOLID AND LIQUID NORM SPILLS.....            | 44        |
| <b>9</b>  | <b>TRANSPORT PLAN</b>                                    | <b>48</b> |
| 9.1       | PURPOSE AND SCOPE .....                                  | 48        |
| 9.2       | CLASSIFICATION OF MATERIALS TO BE TRANSPORTED.....       | 48        |
| 9.3       | HANDLING, PACKAGING AND LABELLING OF NORM SAMPLES.....   | 48        |
| 9.4       | TRANSPORT ARRANGEMENTS.....                              | 50        |
| <b>10</b> | <b>WASTE MANAGEMENT PROGRAM</b>                          | <b>51</b> |
| 10.1      | PURPOSE AND SCOPE .....                                  | 51        |
| 10.2      | WASTE MATERIALS ARISING FROM EL8'S ACTIVITIES.....       | 51        |
| 10.3      | HANDLING MINERAL WASTE MATERIALS .....                   | 51        |
| 10.4      | MINIMISING NORM WASTE .....                              | 52        |
| 10.5      | MANAGING NORM WASTE AND CONTAMINATED MINERAL WASTE ..... | 53        |
| <b>11</b> | <b>REFERENCES</b>                                        | <b>55</b> |
|           | <b>APPENDIX A: APPOINTMENT – EL8'S DESIGNATED RSO</b>    | <b>56</b> |
|           | <b>APPENDIX B: RSO III CERTIFICATE - MS A JOSEPH</b>     | <b>57</b> |

---

---

## ABBREVIATIONS

|                  |                                                                                     |
|------------------|-------------------------------------------------------------------------------------|
| $\alpha$         | – alpha (radiation)                                                                 |
| $\beta$          | – beta (radiation)                                                                  |
| $\gamma$         | – gamma (radiation)                                                                 |
| $\mu\text{m}$    | – micrometer, $10^{-6}$ meter                                                       |
| ALARA            | – as low as reasonably achievable                                                   |
| EGR              | – External Gamma Radiation                                                          |
| EPD              | – Electronic Personal Dosimeter                                                     |
| EPL              | – Exclusive Prospecting Licence                                                     |
| ERP              | – Emergency Response Plan                                                           |
| EIA              | – Environmental Impact Assessment                                                   |
| EL8              | – Elevate Uranium Limited                                                           |
| GM               | – General Manager                                                                   |
| HOC              | – Head of chain                                                                     |
| HR               | – Human Resource                                                                    |
| IAEA             | – International Atomic Energy Agency                                                |
| LDV              | – light duty vehicle                                                                |
| MEFT             | – Ministry of Environment, Forestry and Tourism                                     |
| MDRL             | – Mineral Deposit Retention Licence                                                 |
| MSDS             | – Material Safety Data Sheet                                                        |
| NORM             | – Naturally Occurring Radioactive Material                                          |
| NRPA             | – National Radiation Protection Authority                                           |
| O&M              | – Operation and Maintenance                                                         |
| OH&S             | – Occupational Health and Safety                                                    |
| $\text{PM}_{10}$ | – particulate matter with mean aerodynamic diameters of less than $10\ \mu\text{m}$ |
| PRD              | – Personal Radiation Detector                                                       |
| RMP              | – Radiation Management Plan                                                         |
| RSO              | – Radiation Safety Officer                                                          |
| SHE              | – Safety, Health and Environment                                                    |
| WHO              | – World Health Organisation                                                         |

## DEFINITIONS

|                                 |                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ALARA</b>                    | as low as reasonably achievable, i.e. the basic principle underpinning radiation protection. The principle of ALARA implies that all exposures to radiation are to be kept <i>“as low as reasonably achievable, social and economic factors taken into account”</i>                                                                     |
| <b>Critical group</b>           | the group who are reasonably expected to receive the highest exposure to radiation from the radiation source(s) considered, also referred to as “representative person”                                                                                                                                                                 |
| <b>Exposure pathway</b>         | the route between the radiation source and the receptor(s)                                                                                                                                                                                                                                                                              |
| <b>External gamma radiation</b> | gamma radiation emitted by a given radiation source outside the human body and/or entering the human body from the outside                                                                                                                                                                                                              |
| <b>NORM</b>                     | abbreviation for “naturally occurring radioactive material”, referring to radioactive materials found in the environment, including ores containing radioactive elements such as uranium, thorium and potassium, and their radioactive decay products. All ores and radioactive waste materials arising from EL8’s activities are NORM. |
| <b>Radioactive</b>              | atoms that have unstable nuclei that undergo a decay by emitting radiation from the atomic nucleus are termed radioactive                                                                                                                                                                                                               |
| <b>Receptor</b>                 | person exposed to radiation from one or several radiation sources                                                                                                                                                                                                                                                                       |
| <b>Source</b>                   | a source of ionising radiation, such as naturally occurring radioactive mineral ore or the pulps, sludge, or waste materials of such mineral ore, emitting ionising radiation, thereby exposing receptors to potential radiological risk                                                                                                |

# 1 INTRODUCTION

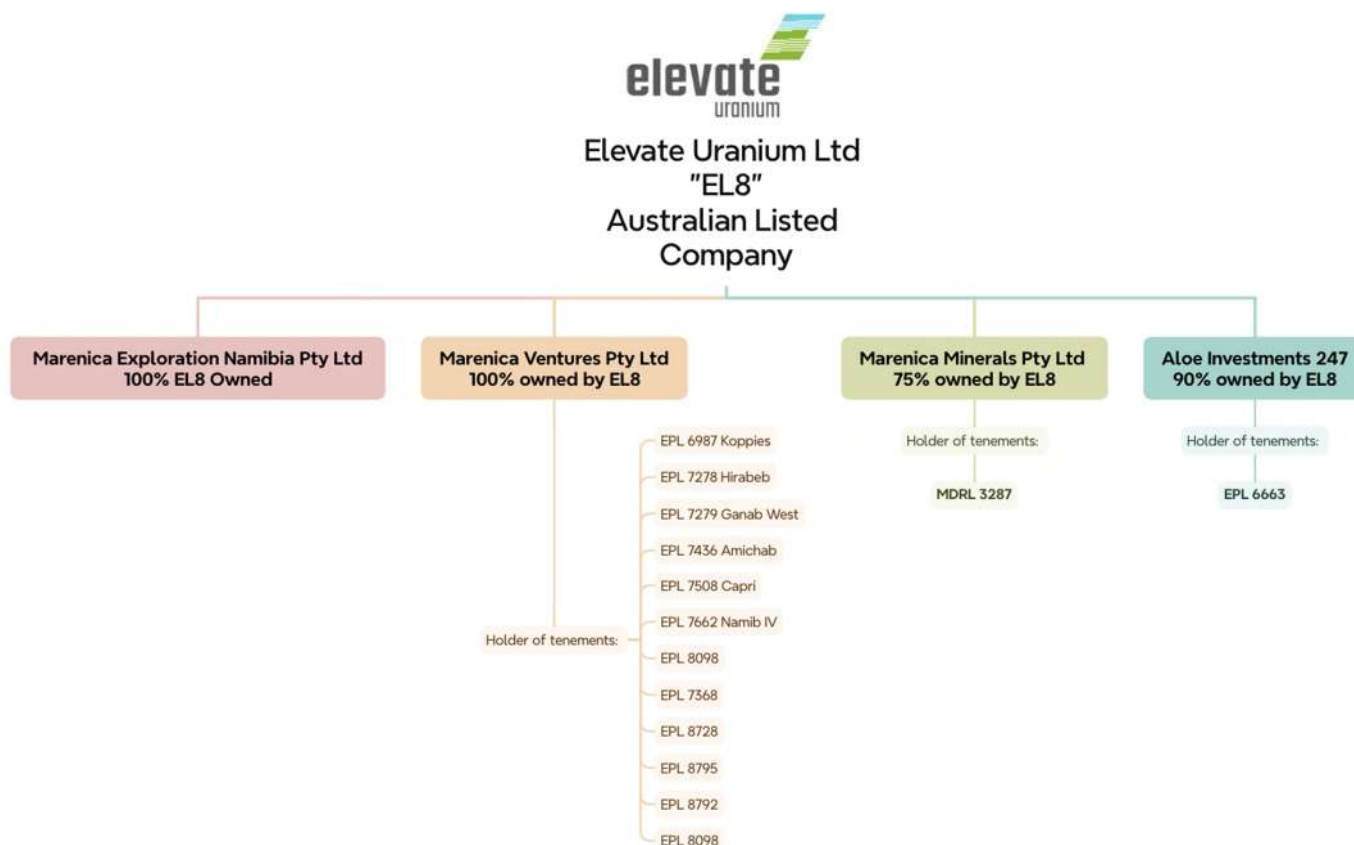
## 1.1 PURPOSE

This document is Marenica's updated Radiation Management Plan (RMP), which was compiled to comply with the provisions in Namibia's Atomic Energy and Radiation Protection Act, 5 of 2005 [Act, 2005], and the Regulations under the Act [NRPA, 2011].

The RMP serves as a comprehensive description of the radiological background, operational risks, radiation protection controls and management of matters related to radiation protection at Marenica.

## 1.2 BACKGROUND

Marenica Ventures Pty Ltd (Marenica) is a member of the Elevate Uranium Ltd. ("EL8") group of companies. The company's Namibian projects are in the Erongo Region, with mineral exploration rights across various tenements. The company and licence holding is set out below:



In 2025, Marenica is planning to assemble and operate a small-scale Demonstration Plant at its premises at Bohrstreet, Swakopmund, to test and demonstrate its patented *U-pgrade*<sup>™</sup> calcite recovery process. The process is applied to enhance the focus on minerals of choice by allowing the rejection of a high percentage of non-uranium bearing minerals from the feedstock.

### 1.3 SCOPE

This RMP follows the sequence of topics as per Regulation 8 [NRPA, 2011], and is structured as follows:

- **Chapter 2** provides a brief background to EL8 and introduces the company and its main activities in Namibia,
- **Chapter 3** describes the pre-operational safety assessments,
- **Chapter 4** illustrates the organisational arrangements relating to radiation protection,
- **Chapter 5** describes the occupational radiation protection program,
- **Chapter 6** deals with the public and environmental exposure protection program,
- **Chapter 7** describes safety and security of sources,
- **Chapter 8** describes the emergency plan,
- **Chapter 9** describes the transport plan,
- **Chapter 10** describes the waste management plan, and
- **Chapter 11** lists the references used in this RMP.
- **Appendix A** contains the Letter of Appointment of EL8's designated RSO, while
- **Appendix B** provides the RSO III Certificate of EL8's RSO, Ms Angelica Joseph.

**Abbreviations** used in this RMP are listed on page vi above.

## 2 MARENICA VENTURES PTY LTD (MARENICA)

### 2.1 INTRODUCTION

This section provides a brief introduction to Marenica Ventures Pty Ltd (Marenica). Marenica is a member of the Elevate Uranium Limited (EL8) group of companies. The company's Namibian mineral exploration projects are in the Erongo Region. The company is undertaking exploration activities for nuclear fuel minerals under EPLs 6663, 6987, 7278, 7279, 7368, 7436, 7508, 7662, 8728, 8795, 8792, 8098, and MDRL 3287 as shown in Figure 1 below.

Elevate's patented beneficiation process that was developed on ore from the Marenica Uranium Project (MDRL 3287) is called ***U-pgrade™***. Starting in 2025, the company is planning to assemble and operate a small-scale Demonstration Plant on its premises at Bohrstreet, Swakopmund, to test and demonstrate its calcite recovery process. The ore to be processed in this Demonstration Plant will hail from the "Koppies" tenement, EPL 6987, and separately from the Marenica Project. Uranium mineralisation identified at Koppies is the same style of ore from the Marenica Project used to develop Elevate's ***U-pgrade™*** process [EL8, 2025].



Figure 1: Location of EL8's EPLs in the Erongo Region of Namibia

## 2.2 CONTACT DETAILS

The company's main administrative offices are in Swakopmund:

Marenica Ventures Pty Ltd, Edison Street, Swakopmund, Namibia.

Contact details are as follows:

Tel: +264 81 653 1214

Email: [murray.hill@elevateuranium.com.au](mailto:murray.hill@elevateuranium.com.au) (EL8 legal person and CEO)

[jessica.bezuidenhout@elevateuranium.com.au](mailto:jessica.bezuidenhout@elevateuranium.com.au) (General Manager)

[angelika.joseph@elevateuranium.com.au](mailto:angelika.joseph@elevateuranium.com.au) (RSO)

Postal: PO Box: 90242, Windhoek, Namibia.

## 2.3 MARENICA'S MAIN RADIATION-RELATED ACTIVITIES

This section describes the company's activities that are of relevance to radiation safety and radiation protection as well as the optimisation of exposures to ionising radiation.

This RMP identifies and describes all relevant management actions that the company implements to limit the occupational, transitional, occasional, and accidental exposures to ionising radiation resulting from uranium mineral exploration and processing activities in Namibia. In this way, the company's radiation-related activities can be controlled and remain compliant with current legal and regulatory provisions as apply in Namibia.

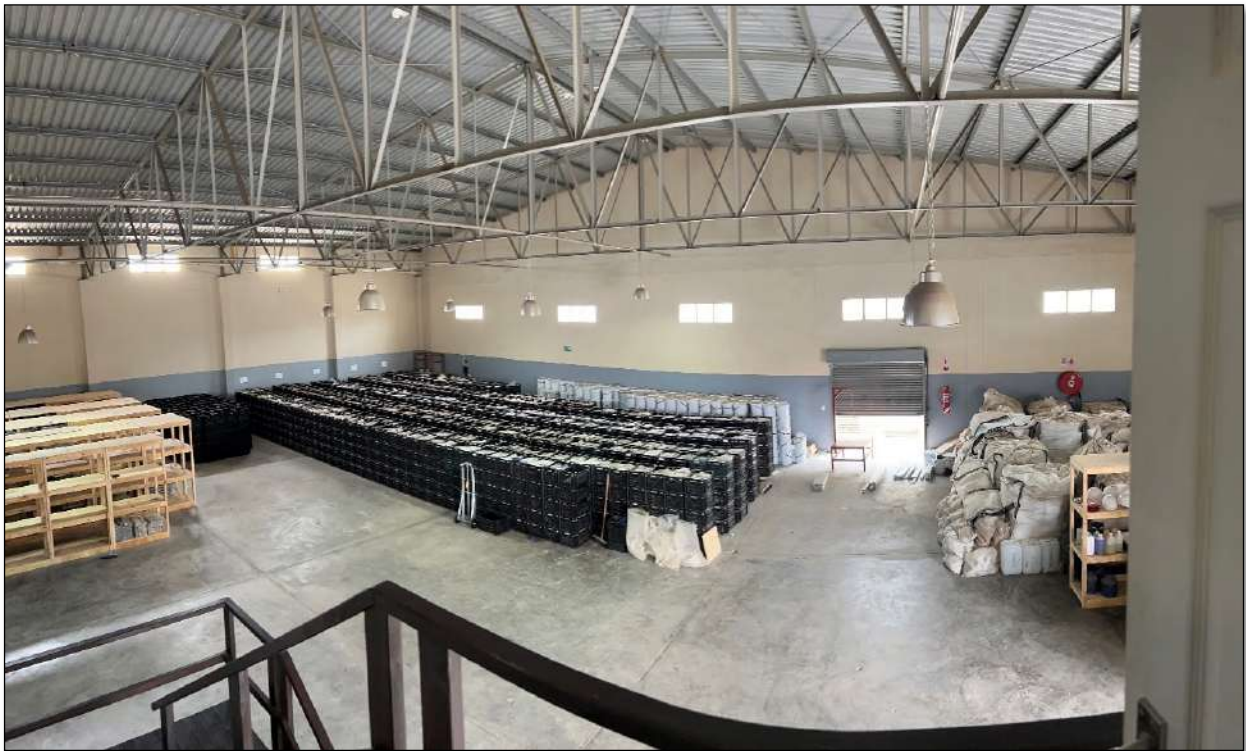
### 2.3.1 URANIUM MINERAL EXPLORATION

The company's mineral exploration activities include the handling and storage of naturally occurring radioactive materials (NORM) (see Figure 2).

According to the company website [EL8, nd], ore grade at the Koppies prospecting area is roughly 200 ppm  $U_3O_8$ , with a cutoff of approximately 100 ppm.

Minerals containing NORM emit ionising radiation. Ore with a grade of 200 ppm corresponds to a head-of-chain (HOC) specific activity of 2 Bq/g from the uranium chain, with the total specific activity from the overall uranium and actinium chains amounting to some 31 Bq/g.

The above implies that certain radiation-related activities undertaken by the Company are regulated under Namibia's Atomic Energy and Radiation Protection Act, Act No 5 of 2005, and associated Regulations, and therefore necessitate radiation protection measures and the optimisation of radiation exposures of staff, members of the public and the environment.



**Figure 2: Uranium-bearing mineral sample storage at Bohrstreet, Swakopmund**

Because of the ionising radiation emitted by NORM, the mineral ores that are handled by the Company as part of the mineral exploration activities, must be undertaken with all precautionary and safety measures as apply in work environments in which ionising radiation occurs. Specifically, the handling, processing and transport, as well as the disposal of NORM waste all necessitate the application of appropriate radiation management activities, including the use of radiation safety instructions, radiation monitoring, radiation contamination control procedures, the use of personal protective equipment (PPE) and associated monitoring and others, all of which are further detailed in this RMP.

This RMP outlines the Company's procedures and approaches applied to limit the actual and potential exposure to ionising radiation of the company's workers and contractor staff, and how these exposure situations are managed by way of optimisation, limitation, and monitoring. This RMP also lays down the approaches to control and prevent the dispersion of mineral NORM, and to minimise any actual or potential exposures of members of the public and the environment.

The Company's mineral exploration activities include the following radiation-related aspects:

1. Field work and geotechnical assessments;
2. Exploration drilling in NORM minerals;
3. Sampling, screening, and crushing of mineral ores containing NORM;
4. Storage of NORM mineral samples;
5. The use of handheld and benchtop XRF devices and calibration thereof;
6. Disposal of NORM waste and mineral residues including NORM; as well as
7. Transport of NORM samples within Namibia, as well as beyond the borders of Namibia, for further analyses of their mineral composition.

### 2.3.2 URANIUM ORE PROCESSING

The ***U-pgrade™*** process removes clay and carbonate minerals from the feedstock ore, producing a concentrate of improved suitability for acid leaching. It is noted that leaching and further processing of the ore concentrate will not take place at the demonstration plant.

The Demonstration Plant will be assembled and operated within hall 1 of the shed leased by Marenica Ventures Pty Ltd at Bohrstreet, Swakopmund, which is currently used for sample storage. The location of the Demonstration Plant is shown in red in Figure 3 below.

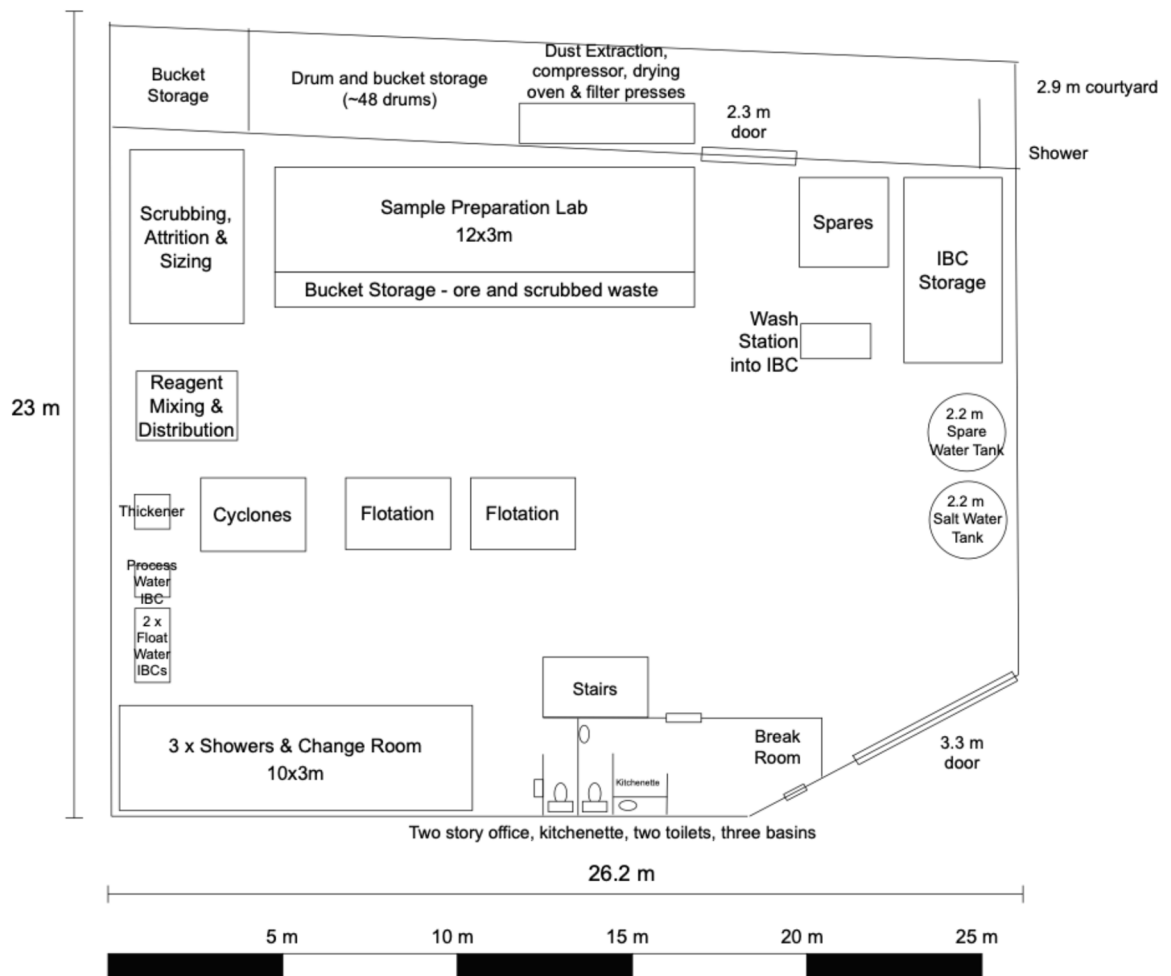


**Figure 3: Location of Marenica's Demonstration Plant at Bohrstreet, Swakopmund**

Hall 1 currently contains two offices, two toilets, a shower, and a kitchenette. A change room, break room, three additional showers, a containerised sample preparation laboratory, demonstration plant equipment and water tanks will be installed within the hall. The planned layout is shown in Figure 4 below [EL8, 2025].

The Demonstration Plant will consist of the following items within hall 1 of the shed as per the layout in Figure 4:

- Existing toilets (2), offices and kitchenette
- 12 x 3 m sample preparation laboratory building (container or demountable building)
- 10 x 3 m building for 3 showers and change room.
- 2 x 10 m<sup>3</sup> water tanks (2.2 m diameter).
- 3 x IBCs (Intermediate Bulk Container) for process water tanks (1 m<sup>3</sup>).
- Change room & break room and
- Three additional showers.



**Figure 4: Layout of Demonstration Plant in hall 1 at Bohrstreet, Swakopmund**

The hall is 600 m<sup>2</sup> with a 3.3 m wide roller door and pedestrian door for access. It has a level concrete floor with no drain. The closest drain is in the driveway leading to the shed. The equipment, break room and sample preparation building will be skid mounted for easy installation and moveability within the shed.

Equipment using chemicals will be bundled, while all other equipment and the perimeter of the hall will be contained using flexible floor bunding. The equipment and shed bunding volumes will be greater than 110% of the largest container within the bund.

The Demonstration Plant will aim to test up to 6 ore blends across an 8-week period operating for 24 hours per day in 2-3 stages. Material will be sourced from the existing exploration pit stockpiles from Marenica (MDRL 3287) and Koppies (EPL 6987). The blends will be created in the field using an appropriate contractor to break, crush and blend < 100 mm ore.

Ore will be wetted in the field and loaded into 20-L sealed buckets to be transported to the plant. Additional water will be poured into each bucket prior to loading into the scrubber. The remaining operations: attrition, sizing, deslime, thickening, reagent dosing, calcite flotation and carnotite flotation will be operated wet at 30-80 % solids.

The scrubbing, attrition and sizing modules are all operated wet whereby the ore will be transferred manually to each operation by buckets at ~50 kg/h and mixed with the appropriate amount of water. After scrubbing and attrition the material will be sized to produce two waste products which will be collected and stored in sealed drums. The remaining material will be deslimed and floated in multiple continuous stages which involves adding flotation reagents (sodium oleate, sodium silicate and dextrin) and air to an agitated cell to float and separate the desired mineral. This produces a slimes/float concentrate and float tail which will be thickened and/or filtered and stored in sealed drums. Thickener overflow will pass through an inline filter to the Process Water Tank to be recycled.

The reagent dosing and flotation modules will be banded, while the scrubbing, attrition, sizing, deslime and thickening modules will be surrounded by absorbent rope to manage spills. Flotation and reagent spillage will be filtered if required, with solids stored in a sealed drum and water returned to the appropriate Float Water Tank or Wastewater Tank. Any other spillage will either be contained or absorbed and solids/absorbent placed into a sealed drum and water pumped to the appropriate Process Water Tank or Wastewater Tank.

The Sample Preparation Lab will consist of a Jaw Crusher, Pulveriser, Work Bench, Filter Presses, Drying Oven, and a benchtop XRF unit. Water will be collected from the filter presses in 20-L buckets.

Any excess water will be poured into the wash station basin where it will be pumped to the Wastewater or Process Water Tank.

Contaminated Personal Protective Equipment (PPE) and rubbish will be stored in sealed drums.

For the 8 weeks of operation the plant will require ~30 m<sup>3</sup> of water which will be recycled to the Process Water Tank. It is proposed to test fresh and sea water, hence the requirement for 2 tanks and multiple intermediate bulk containers (IBC) which allows for spare capacity.

After the operation phase, the product will be about 2 tons of flotation concentrate filter cake with a grade of ~0.5% U<sub>3</sub>O<sub>8</sub> and associated activity of ~54 Bq/g (U-238). This material will be stored temporarily in 20-L sealed buckets in an isolated area of the courtyard.

Waste products from this operation include

- ~30 t of -4.7+0.125 mm at 90% solids. ~100 ppm U<sub>3</sub>O<sub>8</sub> (~1.3 Bq/g).
- ~20 t of 40% thickened slurry or filter cake. ~100 ppm U<sub>3</sub>O<sub>8</sub> (~1.3 Bq/g).
- ~25 t of calcite float concentrate filter cake. ~40 ppm U<sub>3</sub>O<sub>8</sub> (~0.5 Bq/g).
- ~17 t of carnotite float tail filter cake. ~50 ppm U<sub>3</sub>O<sub>8</sub> (~0.6 Bq/g).
- ~0.1 t PPE & waste drum. ~50 ppm U<sub>3</sub>O<sub>8</sub> (~0.6 Bq/g).
- ~0.2 t waste solids drum. ~100 ppm U<sub>3</sub>O<sub>8</sub> (~1.3 Bq/g).
- ~0.1 t bag house solids drum. ~100 ppm U<sub>3</sub>O<sub>8</sub> (~1.3 Bq/g).
- ~5 m<sup>3</sup> process water remaining.
- ~5 m<sup>3</sup> sea water remaining.

All waste products will be stored in sealed drums, buckets, or IBCs for future testing or disposal. Materials below 1 Bq/g could be returned to the test pit or Marenica waste disposal pit, while materials above 1 Bq/g will be transported to a third-party facility for disposal. Discussions with

the Husab Uranium Project are ongoing for waste acceptance. All water will be assayed for uranium and heavy metals before disposal or collection by a third party.

After the operating data and assays have been reported and analysed, additional runs may be needed. Alternatively, there may be a demand to test ores from other sources. The equipment will therefore either remain in the shed or will be packed into shipping containers for storage offsite, as will be decided later.

## **2.4 SOURCES AND TYPES OF IONISING RADIATION OCCURRING AS PART OF MARENICA'S ACTIVITIES**

This section introduces the sources and types of ionising radiation arising from the company's mineral exploration activities.

Atoms with unstable nuclei will strive towards stability by undergoing a series of decays. Unstable atoms undergoing decays are called "radioactive". Mineral ores containing NORM are usually including uranium, thorium, and potassium-40. These elements and their daughter products undergo radioactive decays [VO, 2018].

Radioactive decays imply that ionising radiation of nuclear origin is emitted: one distinguishes between alpha decays whereby two protons and two neutrons are emitted (which is a so-called alpha ( $\alpha$ ) particle), or beta decays whereby an electron (called a beta ( $\beta$ ) particle) is emitted. In addition to alphas or betas, an unstable nucleus also emits excess energy in the form of electromagnetic radiation, which is called gamma ( $\gamma$ ) radiation.

The ores containing NORM handled by the Company as part of its mineral exploration activities are characterised by a wide range of U, Th and K-40 concentrations, some of which are below the Namibian exemption limit as per the stipulations of the Act. This implies that the NORM minerals as handled by the Company are potentially hazardous and may negatively affect staff and contractors employed by Marenica who encounter them (refer to the pre-operational safety assessment presented in Section 3). In addition, such NORM may negatively affect members of the public and/or the environment, which is possible if Marenica applies insufficient radiation safety and radiation protection measures.

Table 1 summarises the main radiation-relevant activities undertaken by the Company and identifies the potential radiation hazards and main types of ionising radiation of each such source.

**Table 1: Activities, potential radiation hazard and type(s) of radiation per source**

| #  | Activity                                                                           | Potential radiation hazards                                                                                                                                                                                                              | Type of radiation                                                                                                                                                                                                                                                 |
|----|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Field work and geotechnical assessments                                            | <ul style="list-style-type: none"> <li>Inhalation of airborne radioactive dust</li> <li>Inhalation of radon and radon decay products (RDP) progeny</li> <li>direct external radiation from NORM ore and associated NORM waste</li> </ul> | <ul style="list-style-type: none"> <li>alpha radiation, internal, by way of inhalation of long-lived radioactive dust (LLRD) and short-lived radon/thoron progeny, and ingestion of LLRD</li> <li>gamma radiation from NORM, direct external radiation</li> </ul> |
| 2  | Exploration drilling in NORM minerals                                              |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                   |
| 3  | Sampling, screening, and crushing of mineral ores containing NORM                  |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                   |
| 4  | Disposal of NORM waste and its mineral residues                                    |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                   |
| 5  | Transport of NORM samples                                                          | <ul style="list-style-type: none"> <li>direct external radiation from NORM samples</li> </ul>                                                                                                                                            | <ul style="list-style-type: none"> <li>gamma radiation</li> </ul>                                                                                                                                                                                                 |
| 6  | Storage of NORM samples                                                            | <ul style="list-style-type: none"> <li>inhalation of RDP</li> <li>direct external radiation</li> </ul>                                                                                                                                   | <ul style="list-style-type: none"> <li>gamma radiation (external)</li> <li>alpha radiation (internal)</li> </ul>                                                                                                                                                  |
| 7  | Processing of NORM samples                                                         | <ul style="list-style-type: none"> <li>direct external radiation</li> </ul>                                                                                                                                                              |                                                                                                                                                                                                                                                                   |
| 8  | Construction, operation, and decommissioning of Demonstration Plant                | <ul style="list-style-type: none"> <li>inhalation of RDP</li> <li>ingestion of NORM-contaminated materials</li> </ul>                                                                                                                    |                                                                                                                                                                                                                                                                   |
| 9  | Office work inside storage halls at Demonstration Plant                            | <ul style="list-style-type: none"> <li>inhalation of RDP</li> <li>inhalation of radioactive dust</li> </ul>                                                                                                                              |                                                                                                                                                                                                                                                                   |
| 10 | Incidents                                                                          | <ul style="list-style-type: none"> <li>direct external radiation</li> </ul>                                                                                                                                                              |                                                                                                                                                                                                                                                                   |
| 11 | Handling NORM samples, including cleaning, packing, piping, and washing activities | <ul style="list-style-type: none"> <li>inhalation of RDP</li> <li>ingestion of NORM-contaminated materials</li> </ul>                                                                                                                    |                                                                                                                                                                                                                                                                   |

NORM may contaminate the environment, by becoming part of the atmosphere, geosphere, biosphere, and thereby the human habitat. In this way, radionuclides may become permanently lodged within the environment, where they will eventually decay or be leached and transported by means of chemical or mechanical forces. When employees, contractors and/or members of the public interact with such radionuclides and their decay products, they may be exposed to ionising radiation from such materials and incur an exposure dose.

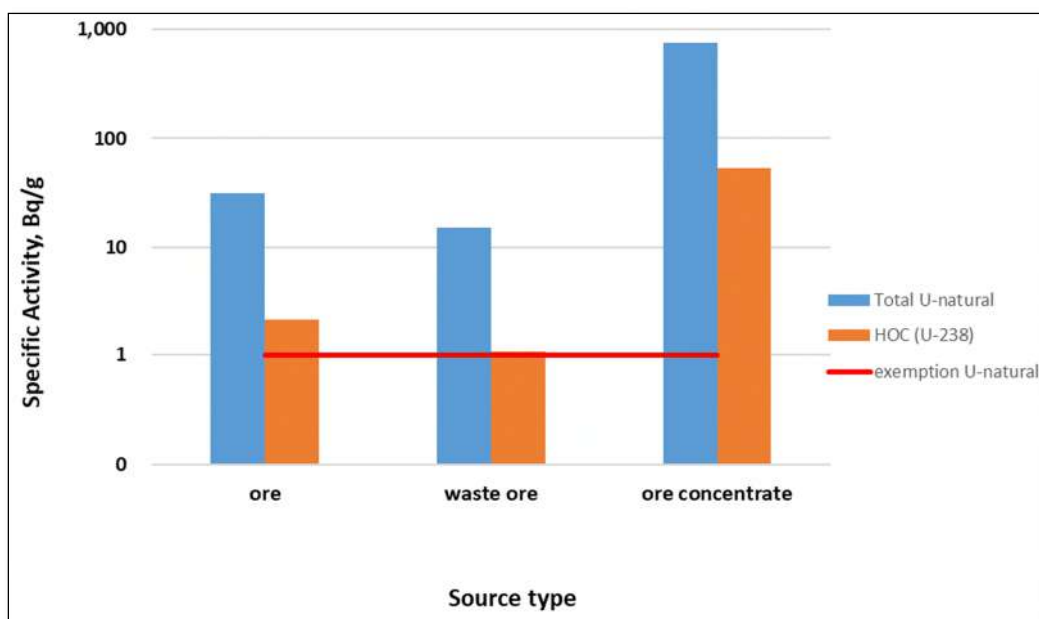
## 2.5 REGULATORY THRESHOLDS

According to the “Koppies Demonstration Plant Operating Strategy” [EL8, 2025], the *U-pgrade* process removes up to 90% gangue, clay and calcrete from the ore. If all the uranium minerals remain in the ore, the specific activity of the product ore will be larger than that of the original ore material.

The uranium grade in waste or reject streams will display an ore grade equal to or less than the cut-off grade of 100 ppm  $U_3O_8$ .

The specific activities of different NORM sources at EL8, i.e. ore, waste ore and ore concentrate, are shown in Figure 5, using a logarithmic scale, with estimates based on reference [EL8, 2025]. The figure displays both the total specific activity in blue, as well as the specific activity from the head of chain (HOC) of the uranium chain in orange, which is the relevant quantity to compare to regulatory limits. Relevant regulatory exemption thresholds are provided in Schedule 1 of the Regulations [NRPA, 2011], namely

- 1 Bq/g for U-238 in secular equilibrium with its decay chain members, which is referred to as *U-natural*, and
- 10 Bq/g for U-238 concentrates, referred to as *U-238*.



**Figure 5: Specific activities of NORM sources at EL8, with regulatory exemption threshold in red**

Radioactive sources subject to regulatory control at Marenica’s ore processing operation are:

- Ore (2.1 Bq/g HOC),
- Ore concentrate (54 Bq/g HOC),
- Waste ore (up to 1.1 Bq/g HOC).

Ore, waste ore and ore concentrate are unprocessed raw materials in the sense that leaching and extraction of uranium has not and will not take place. The materials are classified as *U-natural*,

with an exemption threshold of 1 Bq/g, referring to the HOC. All ore and waste ore derivatives are classified as radioactive material under the regulations.

The second exemption threshold of 10 Bq/g does not apply in the present case, as extraction of uranium does not take place in the Demonstration Plant, as described.

When transporting NORM materials, the IAEA Transport Regulations [IAEA, 2018] apply. There, materials are classified as radioactive if their specific activity and the total activity of a consignment exceed the relevant thresholds in Table 2 of these Regulations. In addition, regulation 107. (f) therein extends the regulatory scope to materials whose activity concentration exceeds ten times the threshold values specified in Table 2. For uranium, this implies the threshold

- a specific activity of 10 Bq/g (from U-238) plus a total activity of 1,000 Bq (from U-238).

Materials exceeding this threshold are regarded as radioactive for transport and therefore require licensing for transport.

## 2.6 EXPOSURE PATHWAYS

This section identifies the main exposure pathways of relevance to EL8's operations.

An exposure pathway is the specific route taken by radionuclides from the original undisturbed locality to a receptor. Exposure pathways often lead through the air, the soil and in water before they reach a receptor.

One distinguishes between radiation reaching a receptor from outside the receptor, and therefore calls such exposure 'external radiation', and the radiation reaching a receptor from within. The latter is referred to as 'internal radiation' and is the result of the inhalation and/or ingestion of radionuclides [Von Oertzen, 2017].

The most relevant exposure pathways as part of EL8's activities (mineral exploration and ore beneficiation) are:

- direct external exposure to gamma radiation from NORM sources;
- inhalation of dust arising during drilling, handling, crushing, or handling of mineral NORM;
- inhalation of radon and thoron and their progeny emanating from NORM; and
- ingestion of NORM-bearing material, for example via the uptake of NORM-contaminated foodstuff, including vegetables and animal products such as eggs and animal meat as well as water contaminated with NORM.

These exposure pathways are further characterised in Table 2 below.

**Table 2: Types of exposure, exposure pathways, types of radiation and main sources**

| # | Type of exposure | Exposure pathway(s)      | Type of radiation               | Source(s)                                 |
|---|------------------|--------------------------|---------------------------------|-------------------------------------------|
| 1 | internal         | Atmospheric - inhalation | long-lived $\alpha$             | NORM dust                                 |
| 2 | internal         | Atmospheric - inhalation | short-lived $\alpha$            | Radon and thoron                          |
| 3 | internal         | ingestion                | $\alpha$ , $\beta$ and $\gamma$ | NORM dust, contaminated materials         |
| 4 | external         | direct                   | $\gamma$                        | NORM ore, dust, sludges & waste materials |
| 5 | external         | direct                   | $\beta$                         |                                           |

## 3 PRE-OPERATIONAL SAFETY ASSESSMENT

### 3.1 PURPOSE AND SCOPE

This chapter provides a brief overview of the pre-operational assessments of relevance to managing the potential and/or actual exposure to radiation which may occur as part of EL8's mineral exploration activities and as part of the operation of the Demonstration Plant.

### 3.2 OVERVIEW

This section summarises the main aspects regarding the environmental impact assessment prepared by EL8 and the activities that have an impact on radiation-related issues and actions as are further described in this RMP.

#### 3.2.1 EXPLORATION

No pre-operational radiological baseline assessment or radiological impact assessments were undertaken prior to the commencement of EL8's mineral exploration activities, see Figure 1.

However, Environmental Impact Assessments (EIAs) were undertaken and resulted in the issuance of Environmental Clearance Certificates (ECCs) by the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT). Impact assessments and environmental compliance reports have been submitted for all EL8's EPLs.

#### 3.2.2 DEMONSTRATION PLANT

The Demonstration Plant is planned in a hall that is currently being used for sample storage by EL8. As this venue is also used as office space for staff, two baseline assessments were undertaken, namely

- a gamma dose rate survey and risk assessment [VOC, 2025] and
- a radon concentration survey and risk assessment [VOC, 2025a].

In the gamma dose rate assessment, the maximum dose rate recorded anywhere in the hall at the time of the assessment (April 2025) was 0.24  $\mu\text{Sv/h}$ , leading to a maximum possible annual dose of 0.5 mSv/a. However, the median dose rate is more representative for occupational exposures, leading to a potential annual dose of some **0.2 mSv/a**. The dose rates recorded result in a classification of this exposure scenario as low risk, with possible annual doses significantly below the public dose limit.

The radon assessment yielded an average radon concentration of at most 55 Bq/m<sup>3</sup>, which would result in annual dose of at most **0.3 mSv/a**, which includes mostly background contributions.

Based on the process description (Section 2.3.2) and the pre-operational risk assessment described above, the risk areas within the demonstration plant have been color-coded from very low (green) through low (yellow) to medium (orange) in the layout plan in 6 below.

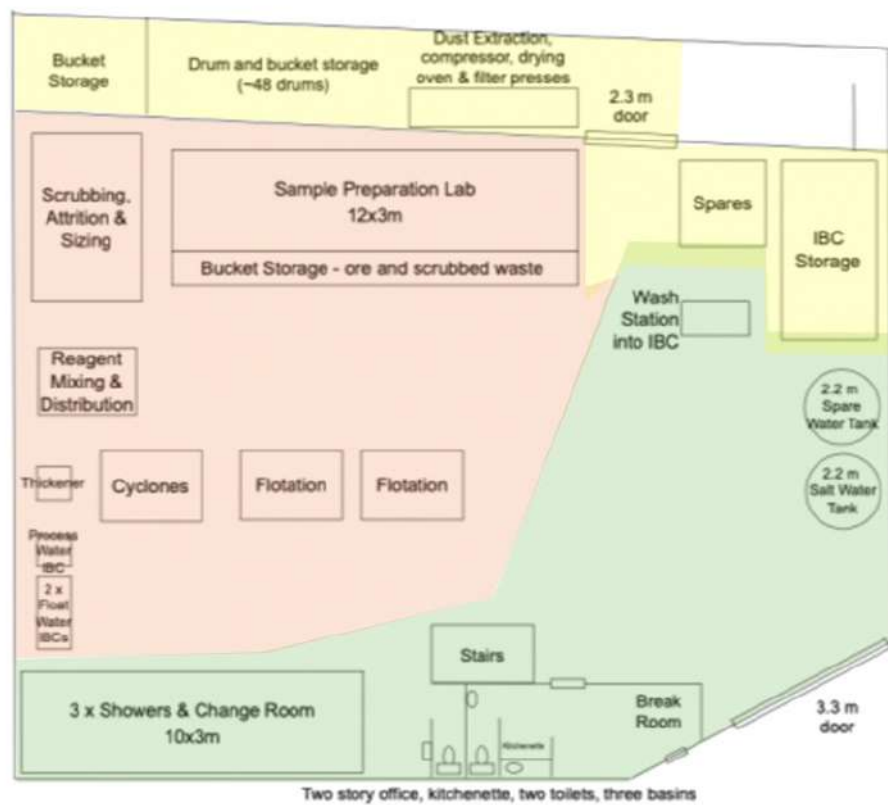


Figure 6: Layout of Demonstration Plant with areas color-coded by risk rating

### 3.3 BEST PRACTICES OF RELEVANCE TO EL8'S RADIATION-RELATED ACTIVITIES

This section presents a summary of the main best practices of relevance to EL8's radiation-related management that form part of the company's mineral exploration activities across its exploration tenements.

The following main lessons are relevant for the optimisation and management of radiation from NORM as occur as part of EL8's mineral exploration activities:

- **Dust generation** must be controlled to minimise the total suspended particle concentration in ambient air and the inhalable dust as is typically liberated during the crushing, processing, transport and handling of NORM ores and concentrates.

Dust mitigation measures are to include:

- Wet-handling of sample materials in the Demonstration Plant; and the use of a dust extraction system within a sealed building for all crushing and pulverising within the demonstration plant.
  - Use of spray water to suppress dust during dusty operations, where relevant;
  - Use of dust suppressants and/or water sprayers to limit the generation of dust on unpaved roads, where relevant;
  - Strict application of personal hygiene measures to limit the intake and associated ingestion of radionuclides contained in airborne dust and dust that has settled on exposed surfaces; as well as
  - Reduction of dust generation from mineral NORM waste and facilities where such waste is disposed of.
- **Preventing the spread of contamination** in the Demonstration Plant:
    - Wet-handling of sample materials;
    - Regular washdowns of dusty areas;
    - Strict personal hygiene measures and cleaning of PPE on site and
    - Bunding of processing area to prevent spill from spreading.
  - **Radiation-related indicators** must be monitored, including associated environmental flows, as are further elaborated in Chapter 5 and Chapter 6 of this RMP.
  - **Environmental indicators** need to be monitored (refer to Chapter 6), including
    - Ambient atmospheric dust concentrations, including dust fallout rates, inhalable fraction monitoring as well as ambient radon concentrations where uranium- and thorium-bearing NORM is stored, especially in unventilated and/or poorly ventilated storage settings.

## 4 ORGANISATIONAL ARRANGEMENTS

### 4.1 PURPOSE AND SCOPE

This chapter describes how the various responsibilities related to the management of potential exposure to ionising radiation are assigned, acted upon, and controlled by EL8.

### 4.2 ORGANISATIONAL STRUCTURE AND REPORTING LINES

This section describes EL8's current organisational arrangements and lines of reporting relevant to the management of radiation safety and applying radiation protection measures.

Figure 7 shows an abridged organogram that illustrates the main chain of command of relevance to radiation management at EL8. Radiation-relevant reporting lines span from the **EL8's legal person and CEO**, Mr Murray Hill to EL8's General Manager, Ms Jessica Bezuidenhout, **EL8's designated Radiation Safety Officer (RSO)**. Three Exploration Geologists and a Geological Technician responsible for the exploration program report to the GM Namibia. The demonstration Plant will be managed by the Plant Manager (on contract), reporting to the GM and assisted by a Senior Metallurgist. Operators and assistants report to the Plant Manager or to the Senior Geologist.

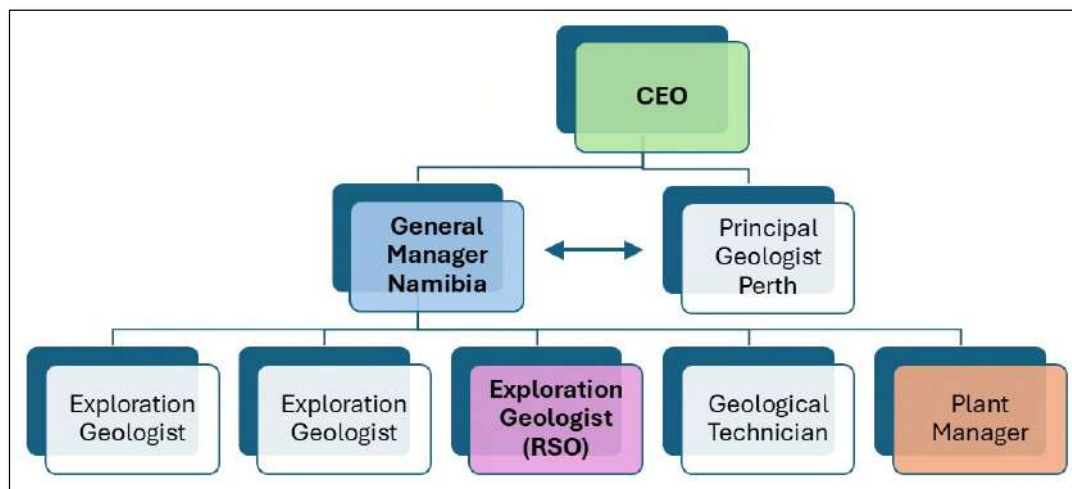


Figure 7: EL8's radiation-relevant organogram (status August 2025)

EL8 has appointed Exploration Geologist **Ms Angelika Joseph** as the company's designated **Radiation Safety Officer (RSO)**, see Appendix A. Ms Joseph holds a Bachelor of Science in Geology (Honours) from the University of Namibia, which was awarded in 2017. Ms Joseph has 6 years of working experience in the country's geology sector, and has attended the **Radiation Safety Officer III Course** that is offered through the Namibian Uranium Institute (NUI) at Swakopmund, see Appendix B.

EL8 also retains the services of **VO Consulting**, who assists the company on radiation-related matters as and when required.

### **4.3 RESPONSIBILITIES OF EL8'S DESIGNATED RADIATION SAFETY OFFICER**

This section provides an overview of the main roles, responsibilities, and reporting functions of EL8's RSO, taking cognisance of the stipulations as per section 30 of the Atomic Energy and Radiation Protection Act [Act, 2005].

EL8's designated RSO is the person who is overall in charge of and responsible for all radiation-related matters at the company, including the day-to-day radiation safety of workers, monitoring and dosimetry, data collection, data verification and radiation-related reporting.

EL8's designated RSO has the following radiation-related responsibilities:

- Direct EL8's radiation management program;
- Identify the sources of ionising radiation used as part of EL8's activities;
- Devise, implement and report on all radiation-related monitoring activities;
- Implement a data collection drive to capture all radiation-related monitoring data;
- Ensure that all radiation-related monitoring activities, including the personal dosimetry and public exposure monitoring, make use of instruments that are fully operational, calibrated and maintained as per manufacturer's guidelines;
- Establish, keep current and maintain the company's exposure records and data;
- Regularly analyse the company's exposure records to identify any aberrant data;
- Investigate, if required, the reason for any anomalous radiation monitoring data, report on such findings, and devise remedial activities;
- Report on radiation-related exceedances to senior management;
- Provide EL8 employees and contractors and their personnel with induction and ongoing training related to radiation safety;
- Raise awareness within EL8 as to the management of radiation safety;
- Ensure that employees and contractors are and remain fully aware of the protective and remedial actions to minimise any potential exposure to radiation;
- Advise the company on matters of radiation safety and protection, including the relevant national legislative requirements;
- Regularly train EL8 employees, contractors and their personnel about current and ongoing protective and remedial activities and requirements to minimise their exposures;
- Ensure that all company regulations pertaining to the management of radiation are regularly reviewed by an external reviewer, to ensure that EL8's procedures remain up to date, and that procedural gaps are identified and addressed;
- Regularly report to the company's CEO on radiation-related developments at EL8;
- Ensure that all employees have access to and use personal protective equipment as required;
- Ensure that employees and contractors are aware and apply the company's procedures and guidelines regarding the optimisation of their exposure to radiation;

- Apply for the required permits for the transport of radioactive materials;
- Regularly liaise with the National Radiation Protection Authority (NRPA) regarding all matters pertaining to the safe and responsible management of radiation at EL8; and
- Report to the NRPA as per their requirements.

#### **4.4 RADIATION SAFETY OF EL8'S CONTRACTORS**

This section describes the interactions related to radiation safety that EL8 has with its contractors and sub-contractors.

EL8 employs a variety of contractors to provide services, including for drilling, transport, processing, rehabilitation, waste disposal, maintenance, sample preparation, electrical services, and others. EL8 also relies on a contractor for managing the Demonstration Plant.

EL8 is responsible for all aspects relating to radiation safety of its contractors. In this regard, EL8's designated RSO is the link between the company and its contractors. Its designated RSO is responsible for the induction of all contractors coming to its exploration sites. Before the commencement of duties, contractors and their personnel are inducted. Such inductions include topics on safety, environmental, radiation safety, personal protective equipment, duty of care, hazard awareness, incident and accident rules, and safe driving.

All contractors and their employees are re-inducted as required, as a minimum once a year. Upon successfully completing an induction session, contractors are issued an induction card, and a pamphlet with the main *do's and don'ts*, including on radiation safety. Contact telephone numbers for the RSO and senior EL8 personnel are provided. Attendance of induction sessions is recorded, and proceedings are recorded and kept on record.

Access to EL8's exploration sites or to the Demonstration Plant is only granted to contractors who have successfully been inducted. Personal and vehicle data is recorded upon entry to field sites. Adherence to occupational health and safety at all sites is regularly monitored by the RSO, and non-adherence to EL8's OH&S rules is recorded and reported to the relevant contractor.

EL8's designated RSO ensures that all radiation-related induction, training, control, and management is undertaken as per the company's guidelines and procedures. Of note is EL8's occupational radiation protection and exposure monitoring program, refer to Chapter 5, and describes how occupational exposure to radiation is optimised, monitored, and reported on.

Contractors are trained and therefore fully aware of EL8's Occupational Health and Safety (OH&S) guidelines, and with it, those pertaining to radiation safety. In turn, contractors are responsible that their employees adhere to such guidelines, and that all necessary equipment is in place to allow employees to adequately protect themselves and minimise their potential exposure to ionising radiation. During site inductions, the OH&S guidelines are introduced, which allows contractors and their staff to be adequately trained to take the necessary remedial actions, as and when required.

Compliance with the company's guidelines is monitored by EL8's designated RSO. This includes that contractors adhere to EL8's occupational health and safety procedures, including all stipulations relevant to radiation protection and the adherence to radiation safety provisions.

## 5 OCCUPATIONAL RADIATION PROTECTION PROGRAM

### 5.1 PURPOSE AND SCOPE

This chapter describes EL8's occupational radiation protection program, which is the company's approach to optimise, manage, monitor, evaluate and report on the exposure to ionising radiation arising from its activities at the mineral exploration sites.

### 5.2 EL8's RADIATION HAZARDS

This section identifies the main radiation hazards encountered in EL8's operations.

Table 3 summarises the activities undertaken at EL8's production site, which are of relevance to managing the exposure to ionising radiation, also indicating the type(s) of radiation associated with each such activity, the main type(s) of such exposure.

**Table 3: Characterising EL8's potential radiation hazards**

| # | Activity                                                                                                                    | Type(s) of radiation                                                                                                                                                                                                     | Type(s) of exposure                        |
|---|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 1 | Field work and geotechnical assessments                                                                                     | <ul style="list-style-type: none"> <li>long-lived <math>\alpha</math> radiation from airborne dust;</li> <li><math>\gamma</math> radiation from NORM,</li> <li><math>\alpha</math> from radon and its progeny</li> </ul> | both internal and direct external exposure |
| 2 | Exploration drilling in NORM minerals                                                                                       | <ul style="list-style-type: none"> <li>long-lived <math>\alpha</math> radiation from airborne dust;</li> <li><math>\gamma</math> radiation from NORM;</li> <li><math>\alpha</math> from radon and its progeny</li> </ul> | both internal and direct external exposure |
| 3 | Sampling, screening, and crushing of mineral ores containing NORM                                                           |                                                                                                                                                                                                                          |                                            |
| 4 | Handling NORM materials, including storage, packaging, cleaning, mixing, sampling, and analysing in the Demonstration Plant |                                                                                                                                                                                                                          |                                            |
| 5 | Disposal of NORM waste and its mineral residues                                                                             |                                                                                                                                                                                                                          |                                            |
| 6 | Transport of NORM samples                                                                                                   | <ul style="list-style-type: none"> <li><math>\gamma</math> radiation from NORM materials</li> </ul>                                                                                                                      | direct external radiation only             |

### 5.3 EXPOSURE GROUP AND WORK AREA CLASSIFICATION

This section introduces the exposure group and work area classification used in this RMP.

The potential exposure to ionising radiation, because of EL8's activities, is influenced by three distinct but interrelated aspects:

- a. **Human behaviours** at or near the sources of radiation, such as time spent near to a source, distance to source(s), shielding used when in the presence of sources, hygienic behaviours, and breathing rate;
- b. **The processes used to handle NORM and other sources of ionising radiation**, such as the drilling and sampling techniques applied, storage and transport, handling, waste disposal, site rehabilitation and others; and
- c. **The ability to absorb, inhale and/or exhale radioactive substances**, and the dynamic processes governing all processes in the natural environment which determine and have an impact on the absorption, storage, and transport of radionuclides.

**Human behaviours** at or near sources of radiation can be significantly influenced, which in turn can limit the exposure to radiation of employees, contractors, and/or members of the public. Management of such human behaviours, e.g. by way of awareness raising and using practical mitigation measures, can result in a significant reduction of any potential exposure to ionising radiation. The behavioural measures put in place by EL8 are further discussed in Section 5.7.

**Processes**, such as the processing of NORM, the use of spray water to limit dust generation, and the specific handling, transport and storage practices of NORM used by EL8 are under the direct influence of the company. Therefore, a combination of work processes, control measures and technologies are used to limit the potential exposure of workers to ionising radiation, which at the same time also limits any potential exposure of members of the public because of EL8's activities. The occupational exposure management is further elaborated in Section 5.8.

**Natural processes**, such as the wind, rain and general weather patterns on the other hand cannot readily be influenced by EL8's management. This implies that activities that are directly or indirectly influenced by natural factors must be regularly monitored and optimised as may be necessary. The exposure to ionising radiation arising because of not taking such natural processes into account can significantly influence the number and exposure doses of exposed receptors.

#### 5.3.1 CLASSIFICATION OF EXPOSURE GROUPS

Based on the nature of EL8's mineral exploration and processing activities, **this RMP introduces two (2) distinct exposure groups, namely:**

- **Exposure group EG 1**, who are persons who are directly involved in handling NORM and its waste products, as part of EL8's mineral exploration activities or as operators in the Demonstration Plant. This RMP refers to members of this occupational group as **exposure group 1, or EG 1**.

The exposure to radiation of members of this occupational worker group includes

- o external exposure to (mainly) gamma radiation at or near to the NORM sources; and
  - o internal exposure from radioactive dust, radon, thoron, and their progeny.
- **Exposure group EG 2**, who are persons, including members of the public, who voluntarily or by accident encounter radionuclides released because of EL8's mineral exploration activities or the operation of the Demonstration Plant. This RMP refers to members of this general albeit *not occupationally exposed group of persons* as **exposure group 2, or EG 2, and classifies all members of this specific group as "members of the public"**.

### 5.3.2 CLASSIFICATION OF WORK AREAS

The work areas associated with the three exposure groups introduced in this RMP are motivated by the main activities taking place at EL8's mineral exploration sites.

#### 5.3.2.1 Controlled Areas – WA 1

The areas where NORM ores and NORM residues are stored are classified as **controlled work areas**, which this RMP abbreviates as **WA 1**.

Access to WA 1 is strictly limited to persons classified as EG 1.

The Demonstration Plant at Bohrstreet with its two halls is classified as **WA 1**. Because of the close vicinity of offices to the plant, the offices form part of the above classification.

#### 5.3.2.2 Supervised Areas – WA 2

All work areas where exploration activities involving NORM take place, except WA 1, are classified as **supervised work areas, i.e. WA 2**. This typically refers to exploration activities in the field.

Access to WA 2 is limited to persons classified as either EG 1 or EG 2.

#### 5.3.2.3 Public Areas – WA3

This RMP classifies all public areas as WA3. All the areas in which mineral exploration work is undertaken by EL8 are classified as either WA 1, or WA 2, as defined above. Therefore, all areas that are neither WA1 nor WA2 are classified as WA3, i.e., public areas.

All persons have access to all areas classified as WA3, including members of the public.

Table 4 presents the classification of exposure groups and work areas as per this RMP.

**Table 4: Exposure group and work area classification used in the RMP**

| <b>Exposure Group Classification</b> | <b>Definition of exposure group</b>                                                                                                              | <b>Work Area Classification</b> |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| EG 1                                 | Occupationally exposed staff or contractors                                                                                                      | WA 1                            |
| EG 2                                 | Members of staff and/or contractors, and members of the public who are exposed to (low levels of) ionising radiation because of EL8's activities | WA 2                            |
| Public                               | Members of the public not classified as EG 1 or EG 2                                                                                             | WA3                             |

### **5.3.3 COMMUNICATING EXPOSURE GROUP AND WORK AREA CLASSIFICATIONS**

All staff and contractors commencing duties at EL8's mineral exploration sites receive a site induction, which includes an overview of EL8's access rules to work areas and the allocation of everyone to an exposure group.

In this way, employees and contractors are trained in matters relating to radiation safety and occupational health and safety rules prior to being allowed to enter the radiologically relevant work areas WA 1 and WA 2.

### **5.3.4 PREGNANT FEMALE RADIATION WORKERS**

**Female employees classified as EG 1** are actively encouraged to immediately inform their respective supervisor if they fall pregnant.

EL8 endeavours to re-assign pregnant EG 1 employees where needed to ensure that work-related exposures of such staff members and their unborn children remain below the public dose limit as is applicable in Namibia. For each pregnant worker, a conservative dose assessment is to be performed in her work area, to confirm the anticipated dose falls below the public dose limit of 1 mSv/a and is optimised according to the ALARA principle.

### **5.3.5 MINIMUM AGE OF STAFF AND CONTRACTORS WORKING FOR EL8**

EL8's company policy stipulates that every staff member and contractor staff must be at least 18 years of age at the commencement of duties at EL8. This also implies that further age-specific precautions are not considered necessary.

## **5.4 OCCUPATIONAL EXPOSURE DOSE LIMITS**

This section summarises the applicable dose limits as per the Namibian Regulations [NRPA, 2011] under the Atomic Energy and Radiation Protection Act for occupationally exposed employees [Act, 2005].

A dose limit is the upper value of the annual exposure dose that a member of a specific exposure group should not exceed during any one year (averaged over or a period of five years).

Table 5 summarises the applicable dose limits for persons classified as EG 1 or EG 2, according to the Namibian Regulations [NRPA, 2011].

**Table 5: Namibian exposure dose limits**

| Occupational exposure group | Explanation                                                                                                                                                                                   | Namibian annual effective dose limit [mSv/a] | EL8's effective dose limit [mSv/a] |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------|
| EG 1                        | For occupationally exposed employees or contractors, a maximum dose of 50 mSv in one year is allowed, provided that the total effective dose of 100 mSv over a 5-year period is not exceeded. | 20                                           | 5                                  |
| EG 2                        | Public dose limit as per the Namibian Regulations.                                                                                                                                            | 1                                            | 1                                  |

## 5.5 MONITORING EQUIPMENT

This section provides an overview of the equipment used by EL8 to monitor occupational exposures to ionising radiation.

### 5.5.1 MONITORING EXPOSURE TO EXTERNAL GAMMA RADIATION

Occupational gamma dose monitoring is undertaken using the ThermoScientific® RadEye Personal Radiation Detector (PRD) monitoring instruments.

Five (5) RadEye PRD instruments are currently in use at EL8's exploration sites. They are regularly calibrated and maintained, as per the manufacturer's guidelines, using representative service agents authorised by the manufacturer, see Figure 8.

At the Demonstration Plant, personal monitoring will be carried out using at least two ThermoScientific® Electronic Personal Dosimeters (EPD) (see Figure 8), which can be assigned to specific jobs for short time periods, allowing detailed information about the exposure profiles of activities.

In addition, RS-125 and RS-120 spectrometers are in use at EL8's exploration sites and storage shed/Demonstration Plant, refer to Figure 9. As a state-of-the-art hand-held radiation survey monitors, these instruments are mainly used to classify mineral ore samples.



**Figure 8: RadEye Personal Radiation Detector (left) and TruDose Electronic Dosimeter (right) to monitor exposure to gamma exposure**



**Figure 9: RS-125 gamma spectrometer**

### **5.5.2 MONITORING EXPOSURE TO LONG-LIVED ALPHA IN DUST**

Airborne alpha activity is occasionally monitored by an external service provider, focusing specifically on work areas where the risk of dust inhalation is deemed to be the highest.

### **5.5.3 MONITORING EXPOSURE TO RADON AND THORON AND ITS PROGENY**

Exposure to ambient radon and thoron concentrations is occasionally monitored by an external service provider, in work areas where the risk of radon inhalation is deemed to be the highest. Such areas specifically include enclosed areas, such as EL8's sample storage shed, where NORM

samples and its residues are stored for longer periods and where the risk for the build-up of radon and thoron may exist, see Figure 10.



**Figure 10: Radon monitoring in the sample storage area at Bohrstreet, Swakopmund**

#### **5.5.4 MONITORING SURFACE CONTAMINATION**

An external service provider occasionally measures surface contamination. Such monitoring campaigns also serves as a control measure to ensure the cleanliness in the specific workplaces and to maintain best work practices.

As an alternative, the use of a ThermoScientific® RadEye B20 surface contamination monitor (Figure 11) or similar may be obtained, the details of which are still to be decided.



**Figure 11: Surface contamination instrument RadEye B20**

## 5.6 MONITORING OCCUPATIONAL EXPOSURE TO RADIATION

This section describes how EL8 monitors the occupational exposure to radiation of its staff and contractors at the company's mineral exploration sites.

Table 6 summarises the monitoring activities for all exposure groups and provides the frequency of such monitoring activities.

**Table 6: Summary of EL8's occupational exposure monitoring program**

| Occupational exposure group | Type of exposure | Exposure pathway               | Equipment                                | Frequency                                                            |
|-----------------------------|------------------|--------------------------------|------------------------------------------|----------------------------------------------------------------------|
| EG 1                        | Internal         | Inhalation of dust             | as used by the external service provider | once per year, or as and when required                               |
|                             |                  | Inhalation of thoron & progeny |                                          |                                                                      |
|                             |                  | Ingestion of dust              |                                          |                                                                      |
|                             | External         | Direct                         | RadEye PRD                               | PRD is worn by select individuals for a period determined by the RSO |
| EG 2                        | Internal         | Inhalation of dust             | as used by the external service provider | once per year, or as and when required                               |
|                             |                  | Inhalation of thoron & progeny |                                          |                                                                      |
|                             | External         | Direct                         | RadEye PRD                               | PRD is worn by select individuals for a period determined by the RSO |

## 5.7 PERSONAL PROTECTIVE EQUIPMENT (PPE) AND BEHAVIOURAL MEASURES

This section describes the personal protective equipment (PPE) and behavioural measures used by EL8 to minimise the occupational exposure of employees and contractors.

Table 7 summarises the PPE requirements of EL8 staff and contractors working on site, noting that it excludes PPE that has no relevance for radiation safety.

**Table 7: Protective equipment and its use by EL8's different exposure groups**

| Occupational exposure group | Protective equipment | Rationale                                                             | Image                                                                                | Work Area(s) where specific PPE is obligatory                                                                               |
|-----------------------------|----------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| EG 1                        | dust mask            | minimise inhalation of dust                                           |    | <ul style="list-style-type: none"> <li>mineral exploration</li> <li>sample preparation</li> </ul>                           |
| EG 1 & EG 2                 | overall              | minimise potential contamination of exposed surface areas of the body |   | <ul style="list-style-type: none"> <li>all</li> </ul>                                                                       |
| EG 1 & EG 2                 | safety glasses       | minimise risk of eye damage                                           |  | <ul style="list-style-type: none"> <li>mineral exploration</li> <li>sample preparation</li> </ul>                           |
| EG 1 & EG 2                 | safety shoes         | minimise risk of injury of feet                                       |  | <ul style="list-style-type: none"> <li>all</li> </ul>                                                                       |
| EG 1                        | gloves               | minimise direct contact between substances and body                   |  | <ul style="list-style-type: none"> <li>mineral exploration</li> <li>sample preparation</li> <li>sample packaging</li> </ul> |

The use of PPE alone is insufficient to minimise the risk of exposure to radiation in a mineral exploration setting dealing with NORM and NORM residues. Therefore, EL8 applies select behavioural measures, as summarised in Table 8, to complement the use of PPE as is assigned to relevant employees.

**Table 8: Behavioural measures used at EL8 to minimise the exposure to radiation**

| Behavioural measure(s)                                                                                                                                                                              | Rationale                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>employee/contractor induction program</li> <li>coaching and mentoring by management</li> <li>penalties in case of a transgression with site rules</li> </ul> | standard measures as per EL8's site induction program                                                  |
| minimise time in work areas where exposure to radiation is likely to occur                                                                                                                          | reduce exposure time                                                                                   |
| maximise the distance between source(s) and person(s)                                                                                                                                               | minimise exposures                                                                                     |
| use shielding as and when reasonable to use                                                                                                                                                         | use all measures that can be reasonably and practically used to minimise potential exposure            |
| Minimise the generation of dust                                                                                                                                                                     | minimise potential exposure to radioactive dust                                                        |
| Apply hygiene measures, incl. washing of hands and face prior to eating, drinking, or smoking, thoroughly clean contaminated PPE prior to leaving work area                                         | minimise ingestion of dust and contaminated materials                                                  |
| Stand up-wind of source(s) of dust                                                                                                                                                                  | minimise inhalation of dust                                                                            |
| Eat and drink in designated areas only                                                                                                                                                              | minimise potential ingestion of dust                                                                   |
| Smoking is only allowed in demarcated areas and while taking a break or being off duty                                                                                                              | minimise the opportunities for removing dust masks, and limit additional exposure arising from smoking |
| Leave work clothes and equipment at designated areas for safekeeping and cleaning, and remove dust at drill sites                                                                                   | minimise the transfer of dust from place of work into public areas                                     |
| Do not handle material if not authorised to do so                                                                                                                                                   |                                                                                                        |
| Report deviations immediately                                                                                                                                                                       | minimise opportunities for mistakes                                                                    |
| Support staff and contractors to remain safe                                                                                                                                                        | actively assist others to stick to established procedures                                              |

## 5.8 MANAGING OCCUPATIONAL EXPOSURE TO RADIATION AT EL8

This section describes how EL8's radiation management activities are supervised, and how the company integrates its radiation-related management efforts into its overall occupational health and safety program.

EL8's designated RSO is responsible for the implementation of the company's RMP, including the implementation of all regular, occasional, and ad hoc activities related to the management of radiation. The designated RSO's tasks related to the optimisation, management and monitoring of the occupational exposure include the following:

- Ensure that all employees and contractors are inducted prior to commencing any work at EL8, including on aspects related to radiation safety;
- Ensure that the induction training includes all aspects relating to activities aimed at optimising occupational exposures, including minimising inhalation/ingestion of dust;
- Regularly raise awareness amongst staff and contractors on radiation-related matters;
- Initiate remedial action if any employee/contractor may have exceeded dose limits;
- Allocate PRDs to members of the exposure groups EG 1 and EG 2;
- Ensure that all monitored persons are correctly wearing the monitoring instruments;
- Ensure that dust emissions are kept as low as reasonably achievable;
- Capture, analyse and interpret data from routine monitoring actions;
- Receive, analyse, and follow up on any unexplainable or otherwise exceptional exposure dose revealed during the analysis of PRD data;
- Prepare regular radiation exposure summary reports;
- Enter individual exposure data into employees' health surveillance sheet;
- Compute exposure doses for staff and contractors, based on monitored results; and
- Prepare cumulative exposure doses for all employees and contractors.

EL8's employee OH&S register includes the following details:

- Names of all EL8 employees and date of commencement of duties at EL8;
- Record of employee's previous employment, provided such employment may have exposed employee to ionising radiation;
- Name and address of medical practitioner who undertook pre-employment medical assessment, and who holds relevant employee/contractor medical record(s);
- Dates of any medical examinations initiated and/or required by EL8, and name and address of medical practitioner;
- Attendance record of annual (for field employees) and 2-yearly (administrative employees) medical check-up;
- Record of participation at radiation-related induction and training courses; and
- Radiation-related data and information.

## 5.9 RADIATION-RELATED INDUCTION AND TRAINING AT EL8

This section describes EL8's induction and radiation training program.

Every EL8 employee and all contractors and their staff participate in a general and a radiation-related induction program prior to the commencement of their duties.

Induction and radiation-related training is offered by the designated RSO, or an external service provider, as required. The radiation safety induction program includes the following topics:

- introduction to radiation
- description of the types, sources, and uses of radiation
- introduction of the concept of a radiation dose and dose limits
- introduction to the effects of radiation on the human body
- description of the main exposure pathways, exposure groups, and work areas
- radiation safety basics
- hazards related to radiation are generally managed
- description of how an individual can limit the personal exposure to ionising radiation, including a description of the basic hygiene procedures and requirements
- description and proper use of the required personal protective equipment to wear
- illustration of how the potential exposure to radiation is monitored at EL8
- overview of how radiation management is undertaken at EL8, and
- summary of the most important "do's and don'ts" to limit the exposure to radiation.

As part of the radiation-related induction and training program, the designated RSO also introduces new employees to the company's occupational health, safety, and environment rules, as well as EL8's emergency procedures applicable to incidents and accidents. EL8's emergency procedures are further described in Chapter 8.

EL8 annually re-inducts staff and contractors active in WA1 and WA2.

## 5.10 MANAGING RADIATION-RELATED DATA AT EL8

This section describes how EL8 manages the radiation-related data and dose records of staff and contractors.

Radiation-related exposure dose data is summarised in the employee health surveillance register, which also contains specific health information of an employee.

**For EL8 staff, irrespective of whether they are classified as EG 1 or EG 2,** the company's health surveillance register contains the following radiation-related exposure dose data and information:

- a. Results of the PRD monitoring program;

- b. PRD number issued, the period during which the PRD was worn, and gamma exposure data from the PRD;
- c. Monthly and running total exposure dose for the year, based on the above data; and
- d. Results of the dust and thoron exposure monitoring program, if available.

Exposure data is stored in a database, which is administered and managed by EL8's designated RSO, containing data related to actual exposure doses of staff and contractors.

EL8's human resources section supports the designated RSO in the maintenance of the occupational exposure dose database and ensures that it is kept up to date and stored in paper as well as electronic format.

The occupational exposure dose database is kept for such periods as prescribed by the NRPA.

Occupational exposure data of employees is made available to the occupational medical service provider on demand.

## 6 PUBLIC MONITORING PROGRAM

### 6.1 PURPOSE AND SCOPE

This chapter describes how EL8 monitors actual and potential public exposures to radiation.

### 6.2 PUBLIC DOSE LIMITS

This section summarises the public dose limits relevant to EL8's operations.

The Namibian public dose limit is shown in Table 9.

**Table 9: Annual public dose limits as per the Namibian Regulations**

| Type of dose received | Comment                                                                                                                                                             | Annual dose limit<br>[mSv/a] |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Effective dose        | In special circumstances, an effective dose of up to 5 mSv in a single year provided that the average dose over 5 consecutive years does not exceed 1 mSv per year. | 1                            |

### 6.3 EXPOSURE PATHWAYS OF RELEVANCE TO MEMBERS OF THE PUBLIC

This section describes the main exposure pathways of relevance to members of the public and defines the critical group(s) and the types of radiation along the main exposure pathways.

The main exposure groups used in this RMP are classified in Section 5.3.1. The exposure group associated with potentially exposed members of the public affected by EL8's activities was defined as **EG 2**.

Persons that are classified as belonging to the EG 2 exposure group are members of the public, including select non-occupationally exposed employees and contractors, who because of their movements close to EL8's mineral exploration activities may occasionally and/or accidentally be exposed to ionising radiation attributable to EL8.

**This RMP defines a critical group of members of the public as follows:** members of the critical group are members of the public who are reasonably homogeneous with respect to their exposure to specific radiation sources and exposure pathways, and who are representative of those individuals that are potentially receiving the highest exposure dose along a given exposure pathway from the sources under consideration.

Applying the above definition results in the identification of the following critical group that is part of the company's public monitoring program: members of staff as well as those members of the public who occasionally visit the company's mineral exploration sites. **Such persons are collectively represented by select staff members who are classified as EG 2, and such persons are considered a proxy for all relevant members of the public.**

All members of the public are part of a single critical group, and their potential dose because of exposure to radiation from EL8's activities is therefore relevant. Exposure group EG 2, and therefore the members of the critical group, may potentially be exposed to ionising radiation from EL8's activities. Such exposure may occur

- due to direct external exposure to gamma radiation because of accidental exposure to radiation from mineral ores, waste material and/or pulp and sludges from EL8's NORM-bearing mineral exploration activities or from materials stored or handled at the Demonstration Plant,
- due to the inhalation of radon and RDP from materials stored at the Demonstration Plant.
- due to the inhalation of long-lived radioactive dust emitted by materials stored in the demonstration Plant or in the storage sheds, or dust emitted during exploration activities,
- due to the ingestion of radioactive materials contained in dust, arising from spills or from the spread of contamination from the Demonstration Plant.

As a result, members of EG 2, and therefore the members of the critical group, can potentially be exposed to external or internal radiation from NORM ore and/or associated waste originating from EL8's operations and activities. Such exposures are monitored indirectly by assessing and measuring contributing factors for each pathway separately.

## 6.4 MAIN PUBLIC RISKS AND RISK AREAS

This section identifies the main public risks and risk areas where the potential for exposure to ionising radiation from EL8's activities are most significant and quantifies the potential exposure dose at such locations.

Members of the public use the access roads at and close-by EL8's mineral exploration sites may potentially be exposed to ionising radiation from NORM ore and associated waste materials, and/or inhale dust and/or radon/thoron released by EL8's operations. It is noted that the potential exposure to radon/thoron progeny, while it may exist in principle, is likely to be extremely low as most areas frequented by such members of the public are usually well-ventilated. In addition, while the ingestion of radionuclides from the aquatic pathway may be a potential risk, it is considered very unlikely and is therefore not considered further in this RMP.

To quantify the potential exposure of a member of the public requires an understanding of the baseline gamma radiation field prior to the commencement of EL8's operations. Such a baseline assessment is unavailable, which implies that the main public risks can only be estimated but not exactly quantified. The process to provide estimates of potential exposures is achieved by considering specific scenarios.

**Scenario 1:** A member of the public spends approx. 2 000 hours per year in a location immediately adjacent to EL8's mineral exploration sites. The average gamma dose rate at this location is determined to be 0.15  $\mu\text{Sv/h}$ , which includes the gamma background contribution of approx. 0.1  $\mu\text{Sv/h}$ . The incremental gamma dose rate from EL8's activities therefore amounts to some 0.05  $\mu\text{Sv/h}$ . This implies that a person exposed to this incremental radiation field is exposed to some 100  $\mu\text{Sv/a}$  when spending 2 000 hours at the location mentioned before.

An exposure dose of 100  $\mu\text{Sv/a}$  is one-tenth of the public dose limit as has been specified in section 6.2 and is therefore very low. It must be noted however that such an exposure dose excludes contributions arising from the inhalation of radioactive dust and radon progeny, as may also be present at the receptor location.

**Scenario 2:**

A member of the public enters one of EL8's mineral exploration sites and comes close to the NORM heaps stacked at the site. The person spends some 3 hours at and near such materials, where he/she is exposed to an average gamma dose rate of some 2.5  $\mu\text{Sv/h}$ . This dose rate is a factor 25 larger than the prevailing background gamma dose rate in the area, amounting to approx. 0.1  $\mu\text{Sv/h}$ .

The incremental gamma dose due to exposure to the NORM ore therefore amounts to less than  $3 \times 2.4 \mu\text{Sv} = 7.2 \mu\text{Sv}$ . Such an exposure dose is commonly considered to be a trivial dose as it is below 10  $\mu\text{Sv}$ .

It is noted that the incremental exposure dose excludes possible contributions from the inhalation of radioactive dust and radon progeny. However, in an open mining and processing setting which is mostly well-ventilated the contributions of dust and thoron are mostly low, provided that best practice measures are applied to limit dust emissions and keep workplaces adequately ventilated.

**Scenario 3:**

A truck transporting one ton of EL8's NORM ore participates in an accident with a vehicle that transports members of the public. The accident leads to the complete loss of load, and sample material containing NORM are dislodged from the truck because of the collision. The bags containing NORM are severely damaged, thus leading to the partial release of NORM ore into the environment.

The driver of transport vehicle as well as the members of the public involved spend 2 hours in close vicinity to the dislodged load, including the NORM ore that was released during the accident. The average gamma dose rate excluding natural background radiation is found to amount to 5  $\mu\text{Sv/h}$ .

Individual exposure doses due to the exposure to the NORM ore amounts to  $2 \times 5 = 10 \mu\text{Sv}$ , which is a trivial dose. As the accident took place in the open, most well-ventilated environments render it unlikely that significant amounts of NORM would have been inhaled.

**Scenario 4:**

A worker at a neighbouring operation in Bohrstreet, Swakopmund, regularly visits staff in the offices of EL8 there. The person visits the Demonstration Plant for 1 hour every workday of the year, i.e. roughly 250 times.

The visiting worker is exposed to radon and RDP, long-lived radioactive dust from the handling of materials at the Plant, accidental ingestion from touching contaminated materials prior to eating, and to external gamma radiation from passing materials in the Plant.

Based on the baseline gamma survey [VOC, 2025], the average gamma radiation in the area prior to operations does not exceed 0.3  $\mu\text{Sv/h}$ , while the dose rate during operations has yet to be determined. The baseline average radon concentration in the area does not exceed 55  $\text{Bq/m}^3$  [VOC, 2025a], while the radon concentration during operations has yet to be determined. In addition, the concentration of long-lived radioactive dust (LLRD) during operations has yet to be determined.

Based on the known baseline conditions, the visitor would be exposed to  $0.3/1000 \cdot 250 = 0.08 \text{ mSv/a}$  from gamma radiation, and to 0.03 mSv/a from radon decay products, both contributions including natural background. The total dose would amount to 0.11 mSv/a including natural background but excluding contributions from the inhalation or ingestion of long-lived radioactive dust, which are not yet determined at this stage. At this stage, the dose is compliant with the public dose limit of 1 mSv/a.

This scenario highlights the requirement to quantify the operating conditions, including by way of gamma dose rate assessment, the determination of radon concentrations as well as atmospheric concentrations of long-lived radioactive dust, during the operation of the Demonstration Plant. This will demonstrate compliance with the public dose limit during conditions of planned operations.

## 6.5 MINIMISING THE EXPOSURE OF MEMBERS OF THE PUBLIC

This section describes the measures employed by EL8 to minimise the exposure of members of the public that may potentially be affected by the company's activities.

Table 10 identifies the main sources of potential exposure of members of the public, and by implication of members of the EG 2 work group and summarises the mitigation measures applied by EL8 to minimise such potential exposures.

**Table 10: Sources of radiation potentially causing public exposures from EL8's operations**

| Source | Activity generating / exposing radionuclides | Mitigation measure(s)                                                                                                                                                                                                                       |
|--------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dust   | Mineral exploration involving NORM ores      | <ul style="list-style-type: none"> <li>• use access control measures to the sites</li> <li>• limit access to the mineral exploration sites</li> <li>• only allow supervised visitors on site</li> <li>• use area warning signage</li> </ul> |
|        | NORM waste removal                           | <ul style="list-style-type: none"> <li>• regularly dispose of all mineral waste</li> <li>• cover waste skips with a tarpaulin</li> <li>• only load / offload waste in still-air conditions</li> </ul>                                       |

| Source                 | Activity generating / exposing radionuclides                                                    | Mitigation measure(s)                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        | NORM sample preparation and handling                                                            | <ul style="list-style-type: none"> <li>• limit access to the processing site</li> <li>• allow only supervised visitors at the processing site</li> <li>• use dust suppression measures</li> <li>• strictly enforce the use of PPE</li> <li>• use bunding to control spills</li> <li>• enforce strict hygiene measures in Demonstration Plant</li> <li>• prevent contamination spreads</li> </ul> |
|                        | rehabilitation of exploration site                                                              | <ul style="list-style-type: none"> <li>• limit access to all sites characterised by NORM</li> <li>• use spray water to suppress dust, when required</li> </ul>                                                                                                                                                                                                                                   |
|                        | vehicle transport on unsurfaced roads                                                           | <ul style="list-style-type: none"> <li>• apply dust suppression measures on dusty roads</li> <li>• use spray water where available</li> <li>• apply speed limit on all unsurfaced roads and tracks</li> </ul>                                                                                                                                                                                    |
| Gamma                  | all activities                                                                                  | <ul style="list-style-type: none"> <li>• limit access to site</li> <li>• limit time at site</li> <li>• maximise distance to all on-site radiation sources</li> </ul>                                                                                                                                                                                                                             |
| NORM samples and waste | accidents / incidents involving the entity(ies) that transport NORM and member(s) of the public | <ul style="list-style-type: none"> <li>• apply emergency and risk minimisation measures as presented in Chapter 8</li> </ul>                                                                                                                                                                                                                                                                     |

## 6.6 MONITORING PUBLIC EXPOSURES

This section describes how EL8 monitors potential public exposures.

In most cases, exposures of members of the public are the result of exposures to NORM and associated mineral waste. EL8 uses a variety of mitigation measures to ensure that dust generated by its on-site operations are minimised. As a result, dust concentrations in air are only monitored when dust suppression measures are shown to be inadequate.

Radon exposure is relevant in spaces that are not well-ventilated, such as in the Demonstration Plant. In this area, regular radon surveys will be undertaken during operations, to ensure radon concentrations are quantified and compliant with public dose limits.

The following gamma monitoring activities are undertaken:

- Identify select staff members that are classified as EG 2;
- Equip such members with PRDs;
- Monitor the gamma exposure doses of such select staff members to infer the gamma exposure doses of the EG 2 cohort.

## **6.7 MANAGING RADIATION-RELATED PUBLIC EXPOSURE DATA AT EL8**

This section describes how EL8 manages the radiation-related public exposure data.

Data from the radiation-related monitoring is captured in EL8's radiation database, which is administered and managed by EL8's designated RSO.

Public exposure dose records are kept for such periods as prescribed by the NRPA.

## 7 SAFETY AND SECURITY OF RADIATION SOURCES

### 7.1 PURPOSE AND SCOPE

This chapter describes the measures taken by EL8 to ensure that its mineral sources of ionising radiation which are under the company's control remain safe and secure.

### 7.2 NORM RADIATION SOURCES UNDER EL8'S MANAGEMENT

This section describes the NORM sources of ionising radiation under EL8's control.

The radioactive materials under EL8's control include

- a) ore samples and drill cores
- b) uranium-bearing waste materials such as waste ores, and pulps,
- c) ore concentrates.

Mineral NORM is stored at EL8's sample storage shed (see Figure 3). Samples are stored in form of both mineral ores containing NORM as well as mineral NORM waste from drilling and sampling activities. The sample storage shed is classified as WA 1, meaning that only staff and contractors classified as EG 1 are allowed to enter and work in the shed.



**Figure 12: Sample storage shed at Bohrstreet, Swakopmund**

Samples are stored in BigBags (see Figure 12), and also include drill cores (see Figure 13) as well as buckets with pulverised sample material (see Figure 14).



**Figure 13: Samples stored outside storage shed    Figure 14: Samples buckets in storage shed**

### **7.3 SAFE-GUARDING EL8'S SOURCES OF IONISING RADIATION**

This section describes the approaches used by EL8 to control access to and safe-guard the NORM sources of ionising radiation under its control.

Access to EL8's mineral exploration sites is limited to persons having the necessary authorisations, which implies that all persons wishing to enter the company's sites must be authorised.

Signage at the access points to the EL8's sample shed shows that access is for authorised persons only, which minimises the opportunities for unauthorised third parties to encounter the NORM materials.

The warehouse stores all the NORM samples from various exploration drillings and will house the Demonstration Plant. The entry doors to the warehouse are kept locked when employees are off duty.

Ore samples and drill cores have no actual commercial value. This reduces the incentive to remove such materials from the storage area.

## 8 EMERGENCY PREPAREDNESS & RESPONSE PLAN

### 8.1 PURPOSE AND SCOPE

This chapter describes those elements of EL8's emergency preparedness and response plan that are of relevance to radiation safety and the optimisation of potential exposures to radiation. The chapter also provides an overview of the procedures applied in case of incidents and accidents involving EL8's NORM samples.

### 8.2 MAIN RISK AREAS – ACCIDENTAL EXPOSURE TO RADIATION

This section identifies the main risk areas where an accidental exposure to radiation may occur. It also identifies the main radiation sources that could potentially cause accidental exposure and quantifies the maximum activities of such sources. Estimates of the maximum scale of any single event in which accidental exposure may occur are also provided in this section.

The main risk areas associated with potential accidental exposures to radiation from EL8's NORM samples are related to their storage, handling, packing, labelling and transport.

Table 11 lists EL8's main radiation-related activities and associated risk areas in which accidental exposure to NORM samples may potentially occur.

**Table 11: Activities and risks which could lead to accidental exposures to radiation**

| Activity                                                                                                                                     | Main risks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Risk rating                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spills during operation of Demonstration Plant                                                                                               | <ul style="list-style-type: none"> <li>• Spreading contamination from dried-up spills with subsequent inhalation/ingestion of radioactive materials</li> <li>• Spreading of contamination from spills into wastewater system with subsequent contamination of sewage plant</li> <li>• Emission of long-lived radioactive dust into neighbouring buildings after a spill, with subsequent risk of inhalation and ingestion by members of public.</li> </ul>                                                                                                                                                                                                   | <b>very low:</b><br>these are all highly unlikely as spills are within a bund in a bundled facility and will be cleaned as they are made. The drain is >5 m from the hall. |
| Transport of NORM samples from the exploration sites, the company's sample storage shed and the local/overseas mineral analysis laboratories | <p>Incidents/accidents related to transporting EL8's NORM.</p> <p>Examples include potential occurrences where the</p> <ol style="list-style-type: none"> <li>a) transport vehicle overturns, or</li> <li>b) participates in a collision with another vehicle, or</li> <li>c) experiences a complete or partial loss of load during transport.</li> </ol> <p>The above incident / accident scenarios may cause a spill of EL8's NORM samples which will then likely result in the uncontrolled release of this product into the environment.</p> <p>If this were to happen, employees, contractors and members of the public may be negatively affected.</p> | <b>very low:</b><br>the ores involved in the potential spills are very low grade, and the quantities are small. Impacts expected are minor at most.                        |

EL8's NORM samples, including in the form of airborne inhalable NORM dust, are the main risk potentially giving rise to accidental exposures of members of the public, employees, and/or contractors.

The maximum scale of any single incident in which an accidental exposure may potentially occur is related to the size of the transport vessels/containers used. In the case of NORM samples transported from the mineral exploration sites and EL8's sample storage shed to local or overseas mineral analysis laboratories, the maximum load per single consignment is always less than thirty (30) metric tonnes per load.

### 8.3 EL8's EMERGENCY RESPONSE PLAN

This section describes EL8's emergency response plan (ERP), including the emergency command and control structure applicable in a radiation-related emergency.

The *Emergency Response Plan* (ERP) describes how EL8 identifies, communicates, and deals with emergency situations, including the accidental exposure to ionising radiation.

EL8's ERP spells out general emergency procedures and guides employees and contractors faced with radiation-related emergencies. Figure 15 shows a schematic diagram depicting the high-level emergency response processes applied by EL8.

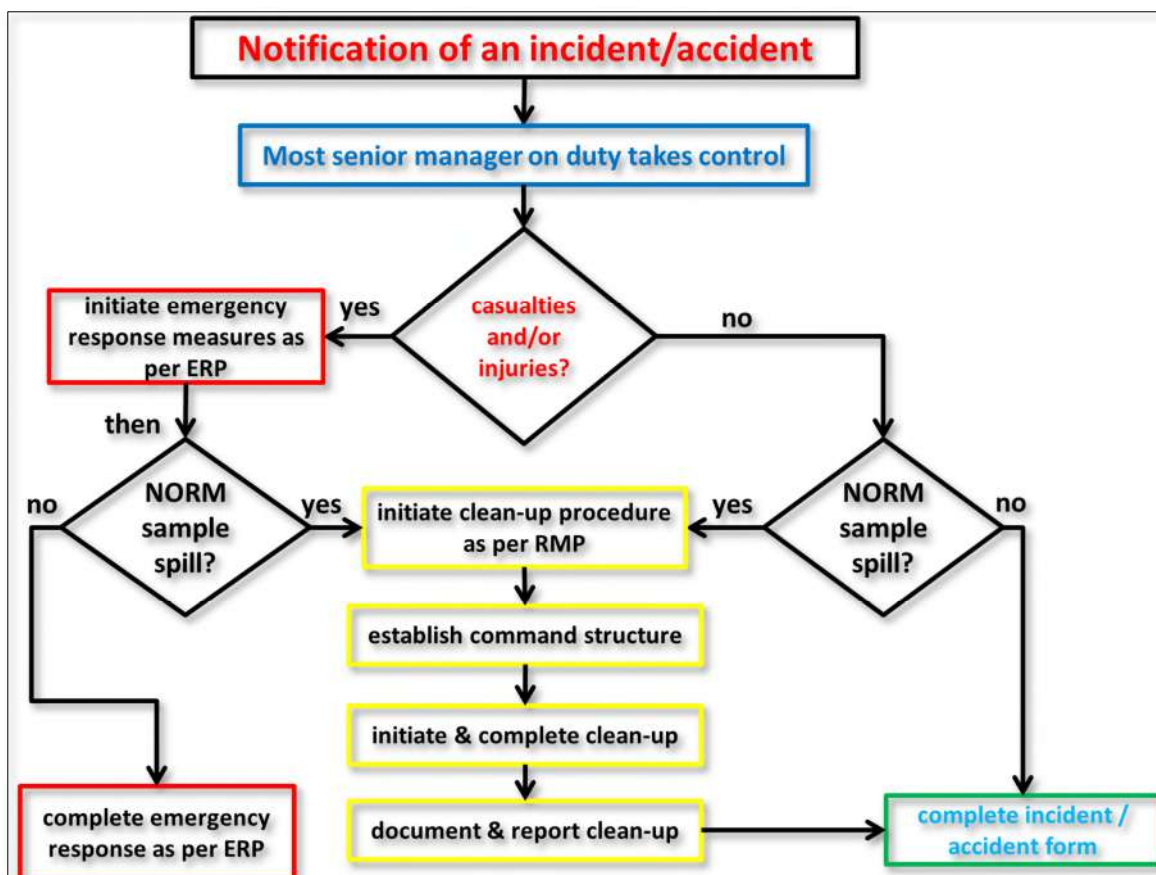


Figure 15: EL8's emergency decision-making and response process

The following **emergency command and control structure** is established in case of an incident/accident involving spilled NORM samples:

1. The most senior manager on duty at EL8 at the time of an incident/accident is responsible for the overall implementation and coordination of appropriate emergency response measures, including in cases of spilled NORM materials;
2. The emergency response manager sets up command and control structures to ensure that emergency measures can be effectively and efficiently provided;
3. A participant involved in the incident/accident or the emergency manager initiates appropriate emergency responses as per the emergency contact list provided in the ERP;

4. The emergency response manager determines how and to whom information about an emergency is to be communicated and specifies the actions to be undertaken, including those for the clean-up of NORM samples spills; and
5. The ERP is communicated to all employees and contractors as part of EL8's induction program to employees and contractors.

## **8.4 VEHICLE ACCIDENTS INVOLVING NORM MATERIALS**

EL8's ERP identifies **road traffic accidents as an emergency** and applies the following responses in addition to its general procedures:

1. The driver of the transport vehicle or relevant other individual noting that an incident/accident occurred raises the alarm and provides the location of the event;
2. Staff or emergency personnel at the scene must shut down the vehicle if it is safe to do so;
3. Vehicles must be made safe first by trained professionals (e.g., crushed, or overturned vehicles);
4. Access to the area must be restricted (if possible) and access roads cleared for the emergency response team;
5. Casualties are to be moved to safety – if at all by trained professionals providing medical assistance;
6. Nearby medical centres having appropriate medical capabilities are to be notified where multiple seriously injured casualties are expected to be delivered; and
7. In the event of animal injuries or fatalities, these are to be reported to relevant authorities, and reasonable assistance is to be provided where possible.

## **8.5 CLEAN-UP OF SOLID AND LIQUID NORM SPILLS**

This section describes EL8's clean-up procedure applicable to NORM sample spills.

### **8.5.1 APPLICATION OF EL8'S CLEAN-UP PROCEDURE**

In the context of this RMP, EL8's clean-up procedure applies in the following situations:

- (a) Spills occurring during the construction, operation, and decommissioning of the Demonstration Plant;
- (b) NORM sample spills occurring during the transport of NORM between the mineral exploration sites, the storage sheds, and mineral analysis laboratories;
- (c) NORM sample spills occurring at the company's various mineral exploration sites.

### **8.5.2 IDENTIFICATION OF A SPILL**

NORM sample spills may occur under one or several of the following conditions:

- during the drilling, sampling, packaging, storing, and handling of NORM ores;
- an accident involving a vehicle transporting NORM samples; and
- loading / off-loading NORM samples onto/from a transport vehicle.

### **8.5.3 NOTIFICATION AND COMMAND STRUCTURE**

When a NORM sample spill occurs, EL8's emergency procedures are enacted.

As shown in Figure 15, EL8's most senior manager who is overall in charge of operations and coordinates the response measures informs the designated RSO of the emergency, who assists in all matters relating to the clean-up of spilled NORM samples.

### **8.5.4 CLEAN-UP PROCEDURE**

The clean-up procedure applicable to spilled NORM has several stages, all of which are obligatory.

#### **8.5.4.1 Assessment**

A competent person(s) closest to the spill assesses the extent of the spill and communicates this to the senior manager in charge of the emergency.

#### **8.5.4.2 Response decision**

Once the scope and scale of the spill has been assessed, the senior manager in charge of the emergency decides on the most appropriate actions to be initiated.

The response decision is communicated to all persons at the site of the spill, relevant local government entities and/or ministerial bodies, as well as the support crew(s) that will assist in cleaning up the spill, as relevant.

#### **8.5.4.3 Preparation**

In case the senior manager in charge of the emergency decides that the magnitude of the spill warrants assistance from persons other than those at the scene of the spill, the RSO assembles the following emergency clean-up equipment and has it loaded onto a suitable emergency response vehicle:

- Mobile dose rate monitor, e.g., RadEye PRD
- Camera or Smartphone
- Note pad and two (2) pens
- One hundred (100) 50 kg plastic bags and 200 cable ties (more if the spill exceeds 2 500 kg of NORM samples)
- Two (2) brooms, two (2) hand brooms, two (2) dustpans and two (2) spades
- Four (4) overalls, four (4) dust masks and four (4) pairs of gloves
- Area demarcation band (red-and-white, five (5) rolls of 100m)

- Ten (10) road-safety cones, bright orange
- Drinking water (10 L)
- Water to suppress dust (~200 L) (more if the spill exceeds 2,500 kg)
- Two (2) watering cans

The RSO and other persons as directed by the senior manager in charge of the emergency, depart for the spill site as soon as the clean-up gear has been loaded onto the response vehicle.

#### **8.5.4.4 Clean-up**

On arrival at the site of the spill, the RSO or person in charge of the clean-up operation ascertains that no employee, contractor, or member of the public requires immediate medical attention.

If such medical attention is required, the person in charge arranges for such medical assistance via EL8's head office. Once the immediate health requirements of employees, contractors and third-party entities involved in the spill have been ascertained, the clean-up of the spill commences using the following procedure:

The clean-up process is undertaken as follows:

1. The RSO and assistants put on PPE, including dust masks.
2. The RSO documents the spill using the notebook and camera.
3. The RSO instructs the assistants to demarcate the complete spill area and ensures that vehicle traffic is not unduly constrained, if applicable.
4. In case members of the public are involved and/or impacted upon, the RSO explains the nature of the material involved in the spill and advises on the necessary measures (washing all contaminated areas on the body, cleaning all clothes) to be taken in case such members encountered any mineral materials.
5. The RSO records the names and contact details of the individuals involved in the spill.
6. The RSO undertakes a brief dose assessment of the immediate area surrounding the spill and records the maximum dose rates measured.
7. The RSO instructs the assistants to commence with the clean-up:
  - (a) Areas where concentrate, pulps, sludge, and other fine mineral materials is spilled are cleaned up first, using shovels, brooms, and hand-brooms.
  - (b) Water is used to suppress dust, if required.
  - (c) The spilled material is gathered and placed into plastic bags, which are then sealed using cable ties.
  - (d) Recovered spill material is covered and placed in a well-ventilated area.
  - (e) In all clean-up efforts, care should be taken that traffic is not obstructed.
8. The RSO documents the progress of the clean-up using the camera. Notes are taken to record additional info, as required.

9. Once all visible spilled NORM samples have been removed from a particular area, the RSO monitors whether the gamma dose rate from the affected area corresponds to areas close-by but unaffected by the spill.
10. If the dose rate exceeds the maximum dose rate recorded in areas adjacent to the spill, further clean-up is required, which is undertaken using additional rinsing water and brooms, where necessary.
11. Upon completion, the RSO takes the final dose rate measurements from the site of the spill, and records these. Photos are taken to document the clean-up.
12. The RSO interviews the transport driver, if available, and any other person(s) at the site of the spill. Notes are taken whenever possible.
13. Once the clean-up has been completed, the RSO instructs employees who participated in the clean-up to place their protective clothing into plastic bags, and seals these using a cable tie.
14. The RSO ensures that all persons involved in the clean-up wash their hands and faces before consuming food or water or embarking a vehicle.
15. On completion of the above steps, the RSO provides verbal feedback to the senior manager in charge of the emergency.

#### **8.5.4.5 Documenting and Reporting**

1. The senior manager in charge of the emergency instructs the driver of the transport vehicle involved in the spill (if applicable) to compile an incident / accident report, as applicable.
2. The senior manager, RSO and other EL8 managers, as required, undertake a post-spill analysis, to determine how the spill occurred, and how such an incident / accident is best to be avoided in future.
3. The RSO summarises those aspects of the clean-up operation that require further strengthening in future clean-up operations.
4. The RSO summarises the events leading up to the spill, describes the clean-up operation and formulates recommendations as to how such spills can be prevented in future, and how the clean-up of spills can be made more effective.
5. The RSO estimates the external exposure dose incurred by all individuals who participated in the clean-up.
6. All PPE, tools and equipment used in the clean-up is cleaned.
7. The incident/accident, the company's response measures, lessons learnt, and recommendations are presented at a special internal managers meeting. The meeting is to be attended by relevant contractors and experts, as required.

#### **8.5.4.6 Official Conclusion of Emergency**

The senior manager in charge of the emergency declares the official end of the emergency once all required reports have been received and the necessary follow-up actions have been successfully completed.

## 9 TRANSPORT PLAN

### 9.1 PURPOSE AND SCOPE

This chapter describes the transport of EL8's NORM samples from the company's exploration sites, its sample storage shed or the Demonstration Plant to mineral analysis laboratories.

### 9.2 CLASSIFICATION OF MATERIALS TO BE TRANSPORTED

This section summarises how radioactive ores and concentrates produced at EL8 are classified.

Based on the IAEA *Regulations for the Safe Transport of Radioactive Material* [IAEA, 2018], both uranium-bearing ores and ore concentrates produced at EL8 are classified as "low specific activity (LSA) materials". The IAEA defines LSA materials as "*radioactive material which by its nature has a limited specific activity, or radioactive material for which limits of estimated average specific activity apply*".

According to Regulation 107 (f) of [IAEA, 2018], the Transport Regulations do not apply to "*Natural material and ores containing naturally occurring radionuclides, which may have been processed, provided the activity concentration of the material does not exceed 10 times the values specified in Table 2...*", which implies that the threshold activity concentration for uranium ores and ore concentrates to be classified as radioactive for transport is 10 Bq/g, referring to the HOC from the uranium chain.

### 9.3 HANDLING, PACKAGING AND LABELLING OF NORM SAMPLES

This section describes how EL8 handles, packages, and labels its NORM samples prior to their transport.

EL8's ore samples have a specific activity of less than 10 Bq/g (from U-238 alone) and therefore do not fall within the scope of the IAEA Transport Regulations.

In contrast, the concentrate produced at the Demonstration Plant has a specific activity of some 54 Bq/g (U-238) and is therefore classified as radioactive for transport. A transport permit from the NRPA is therefore required before such samples are transported.

#### 9.3.1 ORGANISATION

EL8's RSO is responsible to ensure that the transport of the company's NORM samples is planned, coordinated, recorded, and monitored.

To this end, the RSO ensures that

- monthly schedules for transport activities are drawn up;
- a material safety data sheets (MSDS) are available and accompany all consignments of NORM samples;

- transport schedules are coordinated with EL8 staff and the relevant institutions, including the NRPA, MME and MEFT, as well as relevant transport firms;
- the required transport permits are timeously applied for from the NRPA;
- the required export permits (where required) are applied for from the MME;
- drivers of the entities transporting EL8's NORM samples
  - have a valid transport-rated driver's license and passed a first aid course recently
  - have completed EL8's induction(in case of in-house drivers)
  - are equipped and can operate the emergency communication equipment
  - are fully conversant with the company's emergency procedures
  - are fully conversant with the clean-up procedures elaborated in section 8.5
  - have been trained in the management of incidents and accidents
  - have equipment and have practical experience in containing and removing spills
  - have attended an incident/accident training course within the past six months
  - employees/contractors wear the necessary PPE when handling, packing, and loading NORM samples onto light delivery vehicles or trucks used for transport
  - employees/contractors preparing EL8's NORM samples for transport follow the relevant procedures for handling and packaging such materials
  - employees/contractors handling EL8's NORM samples are familiar with the MSDS
  - an up-to-date register is kept of all transport events involving EL8's NORM samples
  - all transport procedures and activities are regularly monitored
  - routine transport movements involving EL8's NORM samples are reported
  - spot checks are regularly undertaken at the mineral exploration sites, the sample storage shed and/or sample packing site, to determine whether all applicable safety precautions and procedural arrangements are practised, and that the preparation, handling and transport of such materials requires any additional safety or procedural guidance.

### 9.3.2 IDENTIFICATION

EL8's NORM samples are either transported by the company itself or by external transport providers. In case the materials to be transported are classified as being "*radioactive for transport*" (using the definition provided by the IAEA, refer to [IAEA, 2018]), such transport necessitates a clearance from the designated RSO prior to its transport.

Prior to its transport, EL8's designated RSO assesses the contact and other relevant gamma dose rates, and these radiation levels are recorded in the consignment note.

As per the relevant IAEA guidelines and classification, EL8's NORM samples are classified as "low specific activity – I" (LSA-I) material [IAEA, 2018].

### 9.3.3 PACKAGING OF EL8's NORM SAMPLES

EL8's NORM samples are usually packaged into plastic and/or steel drums, which are sealed and packed on wooden pallets. Thereafter, packed pallets are loaded onto a truck to be transported to their destination.

It is a requirement of the transport of radioactive materials that the package must retain its integrity during conditions of transport, and that there is no loss of material during transport. This means that any materials transported must be covered and placed into a container that is damage resistant under normal conditions of transport.

## **9.4 TRANSPORT ARRANGEMENTS**

This section describes the transport arrangements that EL8 uses to transport NORM samples between the exploration sites, sample storage shed and local/international mineral analysis laboratories.

### **9.4.1 DOCUMENTATION**

EL8 transports its NORM samples in accordance with the relevant stipulations of the IAEA regulations guiding the safe transport of radioactive materials [IAEA, 2018], and the requirements and stipulations as per the Namibian Regulations.

EL8's RSO keeps a register of the NORM samples transported by or for the company as well as the entities to whom such transport may be outsourced, which includes:

- date of transport;
- destination;
- quantity;
- approximate specific activity and/or contact dose rate of material transported;
- name, affiliation and contact details of entity responsible for transport;
- reference to the radiation safety clearance certificate;
- reference to an incident or accident report, if applicable;
- reference to the NRPA and/or MME mineral export permit, if applicable; and a
- reference to shipment and/or consignment note, if applicable.

### **9.4.2 REPORTING**

EL8's designated RSO is responsible for the documentation required for the orderly transport of NORM samples transported by or on behalf of the company.

The RSO regularly aggregates such transport data and prepares relevant summary reports for EL8 management and the NRPA, as required.

The RSO informs the NRPA of any incidents / accidents involving the transport of EL8's NORM samples.

### **9.4.3 MONITORING**

EL8's designated RSO regularly monitors the transport arrangements and their execution to ensure that the company remains compliant with the IAEA transport requirements, and those stipulated by the NRPA and other Government agencies, as applicable.

## 10 WASTE MANAGEMENT PROGRAM

### 10.1 PURPOSE AND SCOPE

This chapter describes how EL8 manages the mineral waste containing NORM as are arising from the company's exploration activities.

### 10.2 WASTE MATERIALS ARISING FROM EL8'S ACTIVITIES

This section identifies the radioactive waste products arising from EL8's mineral exploration operations and from its Demonstration Plant and describes how such materials containing NORM are generated.

Section 2.3 above described the various radiation-related activities undertaken by EL8. The company's exploration activities generate mineral waste products, including those containing NORM waste and residues that necessitate specific waste management activities as are the topic of this chapter. Waste products are either mineral ore samples, processed ore or liquids and sludges from the beneficiation process.

### 10.3 HANDLING MINERAL WASTE MATERIALS

This section describes how EL8 handles, treats, and disposes of NORM waste.

The primary NORM waste of relevance in this RMP occurs in the form of waste ore materials, pulps, sludges, and dust, in addition to gaseous exhalations such as radon and thoron. Table 12 summarises how EL8 handles, treats, and disposes of such waste products, also showing their main environmental discharge pathways.

**Table 12: Handling, treating & disposing NORM waste and environmental discharge pathways**

| Type of waste material | Handling & treatment                                                                                                                                                                     | Disposal                                                                                                                                                                                                             | Environmental discharge pathway(s)                                                                                                                                                                                     |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NORM dust              | <ul style="list-style-type: none"> <li>Minimise dust, for example by way of wetting and using active dust suppression measures</li> <li>monitor dust emissions at key sources</li> </ul> | <ul style="list-style-type: none"> <li>deposited dust is filled into plastic bags</li> <li>plastic bags are stored in a waste container / waste skip</li> <li>waste is transported to final disposal site</li> </ul> | <ul style="list-style-type: none"> <li>dust enters atmosphere and is thereafter deposited onto soils</li> <li>slow nuclide transport from permanent waste disposal site into adjacent soils and groundwater</li> </ul> |

| Type of waste material                                                | Handling & treatment                                                                                                                                                       | Disposal                                                                                                                                                                                                                                                                 | Environmental discharge pathway(s)                                                                                                                   |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| crushed and partially pulverised NORM ores, NORM waste and NORM pulps | <ul style="list-style-type: none"> <li>collect into plastic bags</li> <li>monitor the collection and regular disposal of waste disposal bags</li> </ul>                    | <ul style="list-style-type: none"> <li>waste materials filled into plastic bags</li> <li>plastic bags</li> <li>waste is transported to final disposal site</li> </ul>                                                                                                    | <ul style="list-style-type: none"> <li>slow radionuclide transport from permanent waste disposal site into adjacent soils and groundwater</li> </ul> |
| radon, thoron, and progeny                                            | <ul style="list-style-type: none"> <li>adequately aerate any closed areas before entry</li> <li>monitor airborne radon and thoron concentrations, when required</li> </ul> | <ul style="list-style-type: none"> <li>ensure sufficient airflow to dilute any build-up of gases</li> <li>disperse high radon / thoron concentrations by using ventilation, as required, for example by way of fans and/or whirly birds mounted to shed roofs</li> </ul> | <ul style="list-style-type: none"> <li>dispersion into atmosphere</li> </ul>                                                                         |

#### 10.4 MINIMISING NORM WASTE

This section describes EL8's procedures to minimise NORM waste from the company's mineral exploration activities.

Table 12 above summarises the main types of NORM waste produced at the EL8's mineral exploration sites, sample storage shed and related operations dealing with NORM samples and associated NORM waste material. Table 13 identifies the corresponding waste minimisation and handling approaches applied by EL8.

**Table 13: NORM waste-specific minimisation and handling approaches applied by EL8**

| Type of NORM waste | Waste minimisation and waste handling approaches                                                                                                                                                                                                                                                                                                             |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NORM dust          | <ul style="list-style-type: none"> <li>apply partial wetting of dusted surfaces before handling materials</li> <li>avoid windy conditions when dust generation is likely to occur</li> <li>ensure that employees wear proper PPE</li> <li>stand up-wind of main sources of dust</li> <li>monitor total and inhalable airborne dust concentrations</li> </ul> |

|                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| crushed and partially pulverised NORM ores, NORM waste and NORM pulps | <ul style="list-style-type: none"> <li>• limit areas where crushed and partially pulverised rock samples are deposited</li> <li>• demarcate areas where NORM waste is temporarily stored</li> <li>• use water sprayers to reduce dust generation where this is possible</li> <li>• apply partial wetting of dusted surfaces before handling NORM waste</li> <li>• use plastic bags to collect small quantities of NORM waste</li> <li>• ensure that plastic bags are removed as soon as possible after filling</li> <li>• use plastic bags to collect crushed/pulverised NORM ore and its waste</li> <li>• close waste bags with a cable ties</li> <li>• temporarily collect waste bags in select waste skips</li> <li>• minimise the time that NORM waste is stored in waste skips</li> <li>• avoid windy conditions when working with crushed and pulverised NORM waste</li> </ul> |
| Radon, thoron, and their progeny                                      | <ul style="list-style-type: none"> <li>• ensure that storage areas for drill cores and ore samples are well ventilated</li> <li>• minimise the time spent in unventilated or poorly ventilated NORM storage areas</li> <li>• use minimum aeration times before entering the NORM sample store</li> <li>• monitor airborne radon / thoron concentrations</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 10.5 MANAGING NORM WASTE AND CONTAMINATED MINERAL WASTE

This section introduces EL8's mineral waste management approach and describes how NORM waste is classified, waste quantities are recorded, and the company's mineral waste inventory. The section also describes how EL8 disposes of NORM waste and how it manages the NORM disposal process.

### 10.5.1 WASTE MANAGEMENT PROCEDURE

The following steps describe EL8's waste management procedure applicable to NORM only and provides a summary overview of the company's quality assurance program as it relates to the disposal of NORM waste.

#### 10.5.1.1 Responsibility and control

1. EL8's designated RSO oversees the company's NORM waste disposal program and coordinates the disposal of such mineral waste;
2. Generally, EL8 backfills NORM waste into the drill holes from which it originates;

3. The designated RSO ensures that the management of all NORM waste is carried out in accordance with the company's waste, health, environment, and safety procedures, as well as the NRPA stipulations and requirements laid down by the MEFT as they relate to the disposal of mineral waste materials and NORM waste; and
4. The RSO regularly monitors the NORM waste disposal sites, including by way of unannounced spot checks.

#### **10.5.1.2 Documentation and reporting**

1. The RSO is responsible for the NORM waste inventory and prepares and maintains the company's NORM waste inventory system;
2. The RSO regularly aggregates the NORM waste disposal data and prepares summary reports for EL8's management;
3. The RSO regularly prepares waste management reports for the NRPA and the MEFT, as per EL8's radiation-related licence conditions and relevant stipulations in its Environmental Management Plan as accepted by the MEFT; and
4. The RSO informs the NRPA of incidents / accidents involving the disposal of NORM waste when discharge limits as stipulated in EL8's license conditions are exceeded.

#### **10.5.1.3 Monitoring**

The RSO and/or EL8's Environmental Officer regularly monitor the disposal of NORM waste to ensure the company's compliance with the above procedure as well as EL8's radiation- and environment-related licence stipulations and requirements.

---

## 11 REFERENCES

In alphabetical order, the references used as part of the compilation of this RMP include:

- [Act, 2005] Atomic Energy and Radiation Protection Act, Act 5 of 2005, Government of the Republic of Namibia, Windhoek, 2005.
- [ECC, 2021] Environmental Compliance Consultancy, Environmental Scoping Report plus Impact Assessment, exploration activities on EPL 7435 for nuclear fuel materials, March 2021
- [ECC, 2021a] Environmental Compliance Consultancy, Environmental Scoping Report plus Impact Assessment, Exploration Activities on EPL 7508 for Nuclear Fuel Materials, March 2021
- [ECC, 2022] Environmental Compliance Consultancy, Exploration Activities on EPL 7278 – Compliance Report, November 2022
- [ECC, 2023] Environmental Compliance Consultancy, Scoping Report with Impact Assessment for Exploration Activities on EPL 8728, Erongo Region, Namibia, April 2023
- [ECC, 2023a] Environmental Compliance Consultancy, Scoping Report with Impact Assessment for Exploration Activities on EPL 8795, Erongo Region, Namibia, May 2023
- [ECC, 2023b] Environmental Compliance Consultancy, Exploration Activities on EPL 7278 – Compliance Report, November 2023
- [EL8, 2025] Elevate Uranium Limited, Koppies Demonstration Plant operating strategy, May 2025.
- [EL8, nd] Elevate Uranium Limited, JORC Table,  
<https://www.elevateuranium.com.au/namibia/jorc-table/>
- [IAEA, 2018] IAEA Safety Standards, Specific Safety Requirements No. SSR-6 (Rev. 1), 2018 Edition, Regulations for the Safe Transport of Radioactive Material, 2018
- [NRPA, 2011] Radiation Protection and Waste Disposal Regulations, No. 221 of 2011, Government of the Republic of Namibia, 2019
- [UN, 2022] UN Recommendations on the Transport of Dangerous Goods - Model Regulations, 22nd revised edition, 2022
- [VO, 2018] von Oertzen, Gunhild & von Oertzen, Detlof, Radiation Safety Officer's Handbook, VO Consulting, 2018
- [VOC, 2025] VO Consulting, Gamma Survey and Risk Assessment in Storage Sheds at Bohrstreet for Elevate Uranium, Swakopmund, April 2025
- [VOC, 2025a] VO Consulting, Radon Survey and Risk Assessment in Storage Sheds at Bohrstreet for Elevate Uranium, Swakopmund, April 2025

## APPENDIX A: APPOINTMENT – EL8’S DESIGNATED RSO

Marenica Energy Namibia (Pty) Ltd  
P O Box 91193  
Klein Windhoek  
Namibia

14 December 2022

National Radiation Protection Authority  
The Director-General: Mr Axel Tibinyane  
c/o Ministry of Health and Social Services  
Private Bag 13198, Windhoek, Namibia

### APPOINTMENT OF DESIGNATED RADIATION SAFETY OFFICER (RSO)

Dear Mr Tibinyane,

Marenica Energy Namibia (Pty) Ltd herewith advises that Ms Angelika Joseph has been appointed as the company’s designated Radiation Safety Officer (RSO).

Ms Joseph holds a Bachelor of Science in Geology (Honours), from the University of Namibia, which was awarded in 2017. Ms Joseph has 3 years of working experience in the country’s geological sector, and has attended the Radiation Safety Officer Courses I, II and III, that are offered through the Namibian Uranium Institute (NUI) at Swakopmund

Ms Joseph is Marenica’s contact person for all radiation-related interactions with the NRPA. Please do not hesitate to contact her in regard to any matter of relevance to our operations: Ms Joseph can be reached by email at [angelika.joseph@elevateuranium.com.au](mailto:angelika.joseph@elevateuranium.com.au).

We trust that this appointment meets the Authority’s requirements.

Yours,

---

Mr Murray Hill (Legal Person & CEO)  
Marenica Energy Namibia (Pty) Ltd

## APPENDIX B: RSO III CERTIFICATE - MS A JOSEPH



**NAMIBIAN URANIUM INSTITUTE**

# Certificate

Auth. No: A.I.A. 21/51

*This is to certify that*

**Angelika Joseph**  
I.D. Number 97013100242

*Successfully completed a course hosted by the  
Namibian Uranium Institute*

**Radiation Safety Officer Part III - Course**

*During the period 16<sup>th</sup> – 18<sup>th</sup> February 2022*  
valid until February 2024

*As per the guidance given by the National Radiation Protection Agency in terms of the  
Atomic Energy and Radiation Protection Act of 2005 and per regulation 218(6) of the  
Labour Act of 1992 pertaining to Occupational Health and Safety in Namibia.*

  
Dr. Detlof von Oertzen  
Course Leader  
VO Consulting

  
Dr. Gabi Schneider  
Executive Director  
Namibian Uranium Institute

Cert. No. NUIRSOIII-2-2022\_3 | Cert. Validity: 2-2024