

**LANGER HEINRICH URANIUM (PTY) LTD**

**ENVIRONMENTAL AUDIT REPORT FOR THE  
LANGER HEINRICH MINE**

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## ENVIRONMENTAL AUDIT REPORT FOR THE LANGER HEINRICH MINE

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## ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report.

<b>Acronyms / Abbreviations</b>	<b>Definition</b>
DEA	Department of Environmental Affairs
ECC	Environmental Clearance Certificate
EIA	Environmental Impacts Assessment
EMP	Environmental Management Plan
ha	Hectare
km	Kilometer
LOM	Life of Mine
LHU	Langer Heinrich Uranium (Pty) Ltd
m <sup>2</sup>	Square Meter
m	Meter
MCP	Mine Closure Plan
ML	Mining License
MET	Ministry of Environment and Tourism
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
NNNP	Namib Naukluft National Park
STP	Sewerage Treatment Plant
TSF	Tailings Storage Facility
WRD	Waste Rock Dump

## ENVIRONMENTAL AUDIT REPORT FOR THE LANGER HEINRICH MINE

### 1 INTRODUCTION

#### 1.1 BACKGROUND

Langer Heinrich Uranium (Pty) Ltd (LHU) operates the Langer Heinrich Mine, situated in the Namib Naukluft National Park (NNNP) approximately 80 km to the east of Swakopmund in the Erongo Region of Namibia (see Figure 1). The mining, processing and associated activities are approved under the mining licenses (ML140 and ML172).

LHU is 75% owned by Paladin Energy Australia, with CNNC Overseas Uranium Holding Limited, a subsidiary of China Nuclear Corporation, holding the remaining 25%.

The mine was placed under Care and Maintenance in June 2018 due to the prevailing low uranium price. In July 2022 Paladin Energy announced the final investment decision to restart LHU's various refurbishment activities and process upgrades are being undertaken at the process plant for increased process efficiency and throughput.

LHU is in the process of renewing its Environmental Clearance Certificate (ECC). Namisun Environmental Projects & Development (Namisun) has been appointed by LHU as the independent Environmental Assessment Practitioner to assist with the ECC renewal application for LHU. As part of the ECC renewal Application process, Namisun conducted an (independent) Environmental Audit of LHU's current activities at the mine, which forms the basis of this Report.

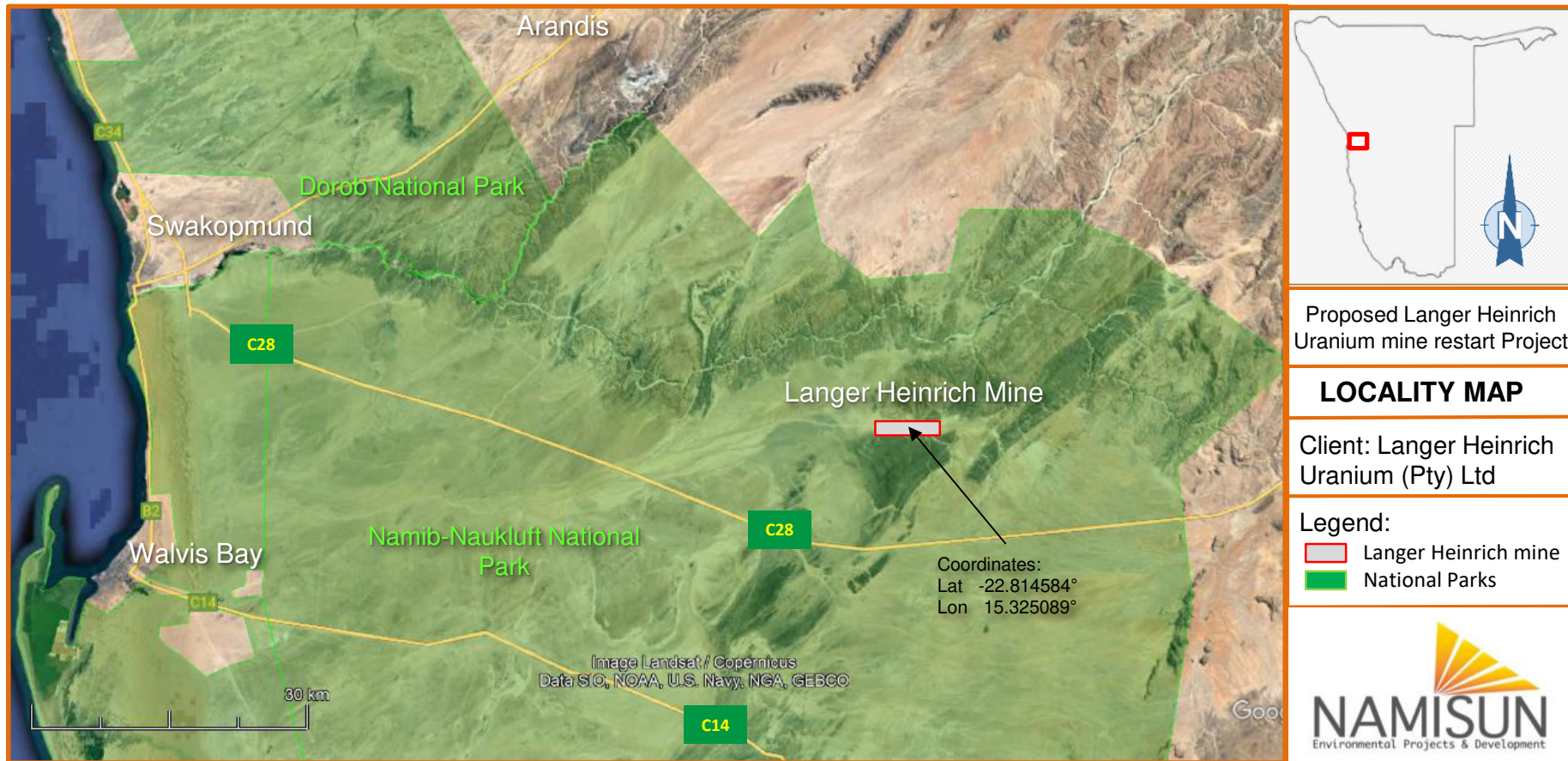


FIGURE 1: LOCATION OF THE LANGER HEINRICH MINE

## 1.2 HISTORY OF ENVIRONMENTAL IMPACT ASSESSMENTS AND ENVIRONMENTAL CLEARANCE CERTIFICATES

An Environmental Impact Assessment (EIA) process was conducted in 2004 / 2005 prior to mining activities commencing at LHU. A number of specialists studies were conducted as part of this EIA and the existing physical and biological environment was described.

In 2008 LHU extended the ecological baseline studies through external specialists relating to the core area (i.e. the area where initial activities were planned within the centre of the ML area). The LHU EMP was also amended to include an expansion of their operations, taking cognisance of the original EIA requirements and the additional ecological specialist studies that were conducted.

LHU further expanded their operations (Stage 3 Expansion Project) and another EIA process was conducted in 2009. A decision was taken to not only assess the impacts of the proposed stage 3 expansion, as part of this EIA process, but to conduct a detailed cumulative assessment of the stage 1 and 2 operations and the proposed expansion.

External specialist were again appointed, through the EIA process, to better understand the existing environment (baseline) and to assess the potential environmental and socio-economic impacts. The impacts were 're-assessed' and recommendations provided on this basis.

In 2011, LHU / Paladin embarked on another expansion project – the Stage 4 Expansion Project. This expansion would have entailed an increase in uranium oxide production from 5.2 to 10 million pounds per annum (Mlbpa) and to convert EPL 3500 into a mining licence (ML) to enable the existing mine to extend into this area. LHU therefore conducted another EIA ('amendment') process for the above mentioned activities (Stage 4 EIA) through an independent environmental team of experts in 2011. The Stage 4 EIA was also conducted on the basis of a cumulative assessment and environmental issues relating to the closure phase were again qualitatively assessed. The Stage 4 EIA was approved by the Ministry of Environment and Tourism (MET), now the Ministry of Environment, Forestry and Tourism (MEFT) and an ECC issued in 2012.

Subsequently, LHU has renewed the ECC as and when required and the latest ECC was issued by MEFT on the bases of an approved renewal application on the 27<sup>th</sup> of August 2020 and is valid until 27 August 2023.

### 1.3 OBJECTIVE OF THIS REPORT

With reference to this report, Namisun's scope of work entailed an environmental performance audit of the LHU against its EMP (Metago, 2012) commitments. However, cognizance was taken of the fact that the mine was under 'care and maintenance' since 2018, therefore no mining and processing activities are being undertaken and these activities (and related commitments in the EMP) did not form part of the audit. Furthermore, various construction / refurbishments activities are currently being undertaken at the mine (i.e. process plant), which was considered as part of the audit. The objective of this report is thus to document the relevant information in this regard.

The following topics are covered:

- The current activities at LHU.
- General management of environmental issues.
- Compliance in terms of the relevant environmental commitments outlined in the EMP, referring to ongoing monitoring, etc. during care and maintenance.

Furthermore, due to the current "change in status" of LHU, i.e. from Care and Maintenance to the planned return to production, this report also provides background relating to the status of approvals (i.e. Environmental Clearance), as well as relevant background of current and future activities.

### 1.4 AUDIT METHODOLOGY

Namisun (Werner Petrick) met a number of times with relevant LHU personnel prior to the audit to (amongst others) obtain background information, confirm the scope of work and to initiate the way forward. Thereafter, Namisun undertook the site visit to the mine on the 7<sup>th</sup> of June 2023, to audit the facilities and activities against the relevant / key EMP commitments. Spot checks of the relevant areas where current activities are undertaken were done, largely at the process plant. The following people from SU were present during the audit and / or were consulted as part of the audit process:

- Mr. Michael Binneman (LHU Environmental, social, and governance (ESG) Practitioner).
- Ms. Mercey Mbuende (LHU Radiation Safety Officer (RSO)).

The information in this document, the "Environmental Audit Report", is based on the author's best scientific and professional knowledge, a site visit and onsite inspection conducted by Namisun, input from personnel of LHU, referencing to the relevant environmental legislation and the existing EMP and other relevant literature, as well as other documents shared by LHU. Namisun cannot



verify all information contained in this report and relies on the information shared by the team of LHU as being accurate.

## 2 CURRENT AND FUTURE ACTIVITIES

### 2.1 PAST OPERATIONS

Construction of the LHU, process plant and associated infrastructure commenced in 2005, and staged commissioning of the plant began in August 2006. The mine was officially opened in March 2007. With reference to section 1.1, on 25 May 2018, Paladin announced that the LHU was to be placed on care and maintenance and stopped presenting ore to the plant. The mine was then placed under Care and Maintenance the following month.

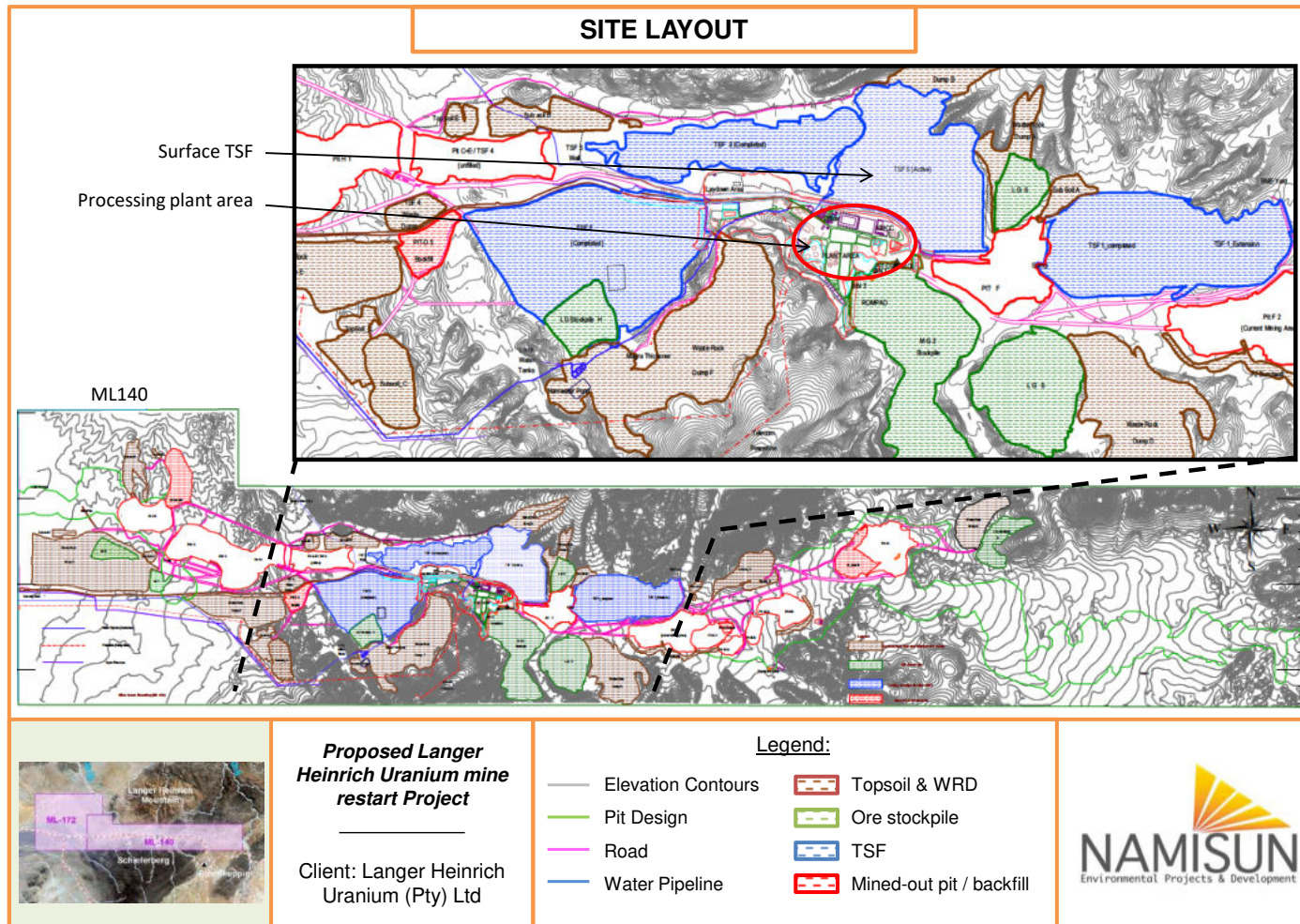
Prior to this, LHU conducted the mining, processing and associated activities, producing up to 5.2 million pounds per annum (Mlbpa) uranium oxide ( $U_3O_8$ ), aligned with the stage 3 expansion project (see section 1.2). See Figure 2 for a photo of the LHU. Even though LHU / Paladin have not implemented the proposed stage 4 Project, these further expansions and increased production (i.e. 8.7 to 10 Mlbpa  $U_3O_8$ ) have been assessed and approved, as described in section 1.2. The current ECC therefore allowed for this increased production and associated activities at LHU.



**FIGURE 2: PHOTO OF LHU**

The key infrastructure and activities within ML140 and ML172 implemented before the care and maintenance phase are shown on Figure 2 and are summarised below:

- Open pit mine.
- Ore stockpiles.
- Waste rock dumps.
- Processing plant.
- Tailing storage facilities.
- Internal haul roads.
- Sewage and water plants.
- Fuel storage facilities.
- Offices, stores and workshops.
- Laboratory.
- Explosives store.
- Exploration site camp.
- Mine access road.
- Power lines, pipelines and generators.



**FIGURE 3: LHU SITE LAYOUT**

## 2.2 CURRENT ACTIVITIES AND LHU'S PROPOSED RETURN TO PRODUCTION

With reference to section 1.1, Paladin Energy announced the final investment decision to restart LHU in July 2022. This followed a pre-feasibility study to restart the LHU and return to production, which was completed in June 2020 followed by a valued add study in June 2021.

Various refurbishment activities and process upgrades are being undertaken at the process plant for increased process efficiency and throughput. The restart is planned for the first Quarter of 2024. According to the Mine Restart Plan, mining and processing is envisioned for a further 17 years - i.e. Life of Mine (LOM) until 2041. The first two years of operation will be from existing ore stockpiles, where after mining will recommence in 2025.

Along with the recommencing of the operation, the proposed changes to the activities and the associated key environmental impacts were 're-assessed' and, where relevant, the approved Environmental Management Plan (EMP) reviewed and amended.

Key activities considered during the above mentioned impact assessment and amendment of the EMP are summarised below and in the EIA Scoping (including assessment) Report for LHU's Return to Production Project.

### 2.2.1 GENERAL OVERVIEW

The table below provides a summary of the proposed activities and facilities relating to the mining and processing and associated infrastructure. Refer to Figure 3 for the approved layout.

**TABLE 1: SUMMARY OF THE PROPOSED RESTART ACTIVITIES COMPARED WITH EARLIER EIAs**

<b>FACILITY / ACTIVITY</b>	<b>PREVIOUS APPROVED EIA(S) (considering both Stage 3 and Stage 4 EIAs)</b>	<b>PROPOSED RESTART PLANS</b>
Life of Mine (LOM)	~17 years	Remaining LOM is 17 years from Q1 2024
Mining	Conventional open pit mining methods. Currently, no change in mining planned. Refer to Figure 3 for the total planned mined area.	
Processing method	Alkali (tank) leaching	
Processing rate (production of uranium oxide)	Up to 10 million pounds per annum (Mlbpa)	~5.5 Mlbpa at restart, working towards 5.9 Mlbpa.
Mine residues (waste rock)	No current changes planned for the previous assessed / approved WRDs	
Processing residues (i.e. tailings)	No change currently planned for the in-pit tailings deposition activities.	
Water requirements & supply	NamWater supply: 1.5 million m <sup>3</sup> /a (stage 3) and up to ~7.5 m <sup>3</sup> /a (stage 4).  Swakop River abstraction: 0.5 million m <sup>3</sup> per year.	NamWater supply: 2.2 Mm <sup>3</sup> /a.  Swakop River abstraction: ~0.330 m <sup>3</sup> per annum
Power supply	Electricity supply from the NamPower Kuiseb substation connecting to the mine via a 50 km 66 kV power line will remain.  A diesel generator facility is used to augment the NamPower supply.	
Mine access	Gravel access road from the C28 to LHU. Improvements to the road condition would be required as part of the mine restart.	

### 2.2.2 MINING

As per the original / approved EIAs, conventional open pit mining, i.e. load and haul activities, are proposed. Both waste rock and ore material will be hauled from the mining area to a specific WRD and ore stockpile locations in the project's mining area respectively. However, mining is

planned to commence only in 2025 with the first 18 months of production being fed from existing stockpiles using a small reclaim fleet.

Any future changes in the mine plan will be subject to further re-assessments and authorisation.

### 2.2.3 PROCESSING

Restart production targets have been increased to 5.5 Mlbpa (at restart, working towards 5.9 Mlbpa) tonnes per annum (Mt/a) from the previous 3.4 Mt/a. This will be achieved by increasing the runtime from 85% to 90% and the mill feed rate from 448 tph to 700 tph.

Upgrades in the front end of the process include improved chute designs, a second teeter bed classifier and cyclone modernisation. A dust extraction system will be installed to address previously problematic dust generating areas.

Leach feed surge tanks will be installed prior to the leach circuit to improve process stability. The alkali tank leach circuit will remain unchanged. The solids washing thickener circuit will be upgraded with minor feed well retrofits. The tailings dewatering system will be upgraded to improve water recovery within the process.

The recovering and recirculating of recovered tailings solution remain unchanged. A final product thickener is being installed to improve product quality. The existing FPR building and associated equipment is being dismantled and replaced with fit for purpose building with upgraded process equipment.

Historically LHU produced  $UO_4$ . The upgraded facility will produce higher quality product in the form of  $U_3O_8$  via an improved product washing and calcination process.

The type of reagents used in the process will remain unchanged however, consumption rates are expected to increase by approximately 10-30% depending on reagent type and process area. Two separate stacks will be installed in the FPR building. The first stack will emit filtered air from the final product packaging unit. The second stack will vent treated off gas from the final product recovery process. Both stacks will be fitted with a sampling port to monitor vented gases.

The mine has a Heavy Fuel Oil (HFO) Plant for steam generation in the leaching process, comprising of three (3) HFO boilers which will be refurbished for use in the future.

The seven (7) burners used in the past to heat demineralised water for the heat exchangers, have been decommissioned.

#### **2.2.4 MINERALISED WASTE FACILITIES**

Waste rock which includes barren material and mineralised material with a grade lower than the cut-off grade will be dumped at dedicated WRDs. There are WRDs located to the north and east of Pit A and adjacent to TSF2 to the west. A number of additional WRDs will be required as future mining expands, as per the approved mine plan.

LHU will continue with the approved in-pit tailings deposition activities. However, LHU is considering potential amendment to the current and proposed future facilities. These are however still being investigated. Any future changes will be subject to further re-assessments and authorisation

#### **2.2.5 Road maintenance**

The current gravel access road to the mine is deteriorating. This is being repaired and will be maintained to ensure sustainable future use.

#### **2.2.6 Power supply to the mine**

The existing 66 kV powerline from the Kuiseb substation will remain as is for the supply to the mine. The future power demand will be 10 to 12 MW.

There are six (6) existing identical generators with a total generation capacity of 10 MW located in the process plant area. These generators will be used as co-generation and back-up power generation when power from NamPower is interrupted.

LHU is exploring renewable power options. This will, however, be subject to further studies.

#### **2.2.7 Water supply to the mine**

Water requirements will increase from 1.84 Mm<sup>3</sup> pa (i.e. operations prior to care and maintenance) to 2.2 Mm<sup>3</sup> pa. Historically, water usage was typically in the range of 0.45-0.50 m<sup>3</sup>/t of ROM feed. Restart unit water consumption is envisaged to be ~0.40 m<sup>3</sup>/t as a result of the process changes described in section 2.2.3. The primary drivers for the increased water consumption include reagent make-up and consumption, reverse osmosis (RO) permeate production and process water balance stability.

##### **2.2.7.1 NamWater Supply**

NamWater owns and operates the bulk water supply pipeline (i.e. the “Swakopmund-Langer Heinrich Water Supply Scheme”) to LHU. The pipeline is routed from the Swakopmund Base Reservoir, following the C28 Road (above ground) to the LHU access road, where it is underground.

The current water pipeline along the C28 Road will remain as is (i.e. the diameter is big enough), however, the three existing pump stations will be upgraded. The height of the existing pump houses will have to be increased to accommodate the larger pumps and associated infrastructure.

The height will increase from ~7.5 m to ~5.4 m. The construction activities will be undertaken by accessing the respective pump houses from the C28 road.

NamWater has a valid ECC for the LHU Water Supply Scheme. NamWater will submit an application (i.e. amendment application) o MEFT for the proposed upgrades to the pump stations.

### **2.2.7.2 Swakop River water abstraction**

Water abstraction from the Swakop River will also resume from the same abstraction boreholes. The same pipeline will be used, however, a booster pump station will be installed approximately halfway between the boreholes and the mine. An 11 kV powerline will be installed to supply electricity to the pump stations which historically were diesel generator driven.

### **2.2.7.3 Water storage at the mine**

LHU is planning to install a new (3<sup>rd</sup>) water storage bladder next to the existing two bladders. This will be for water security reasons. The existing two bladders' joined capacity is 50 000 m<sup>3</sup>. The new bladder will have a capacity of 12 000 m<sup>3</sup>.

## **2.2.8 Employment**

The employment at LHU is summarised in Table 2.

**TABLE 2: EMPLOYMENT AT LHU**

<b>PHASE</b>	<b>PERMANENT EMPLOYEES</b>	<b>CONTRACTORS</b>	<b>COMMENTS</b>
Care and Maintenance Phase	15	50	As of end June 2022
Refurbishment of process plant (current phase)	23	755	As of end June 2023
LHU restart production phase	306	~279	Based on December 2027 information

## **2.2.9 Mine Restart schedule**

LHU has commenced with the repair and refurbishment of existing infrastructure and equipment at the mine. Construction completion is due in October 2023. Completion of equipment energisation and no-load testing is planned for November 2023. Cold and hot commissioning



activities are expected to commence in December 2023 with first product production targeted for Q1 2024.

Production will resume from existing ore stockpiles for the first 18 months as production rates are gradually ramped up. Mining operations are planned to commence in 2025.

### 3 ENVIRONMENTAL MANAGEMENT / PERFORMANCE

Namisun conducted an environmental audit and composed an “Environmental Audit Report” (this report), as per appointment by LHU, for submission to the authorities. The objectives and methodology of this task are described in Sections 1.3 and 1.4 respectively.

During the site visit and inspection, Namisun used the approved EMP as the basis to measure the current environmental performance at LHU, taking cognizance of the recent ‘care and maintenance’ status of the mine and the construction / refurbishments activities currently being undertaken at the process plant. Therefore, “general / typical” good practice measures were also considered and inspected by Namisun.

Please note: Namisun cannot verify all information contained in the findings below and relies on the information shared by the LHU. Compliance to the various key EMP commitments, etc. is therefore assumed and accepted by Namisun to be correct, based on the input from the team of LHU as well as visual inspections by Namisun during the site inspection.

The following abbreviations are used in the sections below:

- **C** = Compliance
- **PC** = Partial compliance
- **NC** = Non-compliance

#### 3.1 AUDIT FINDINGS

The findings from audit are presented in the sections below. These findings are organized according to the structure and headings of the existing (approved) EMP, where relevant.

##### 3.1.1 GENERAL STAKEHOLDER COMMUNICATION

1) *Liaising with interested and affected parties at all phases in the mine life and Reporting to stakeholders*

*Audit finding: C*

- LHU / Paladin announced their Care and Maintenance status to relevant stakeholders and also in the media in 2018.
- With reference to section 1.1. Paladin also announced the final investment decision to restart LHU.
- LHU continues to be an active member of the Chamber of Mines in Namibia and participate in workshops / meetings with the Namibian Uranium Association.

- LHU's ECC Renewal Application process and NamWater's proposed amendment application was advertised in the following newspapers (Market Watch section), informing interested and Affected Parties (I&APs) about the application process, availability of report and how to register as an I&AP:
  - Republikein (5 June and 12 June 2023)
  - The Sun (5 June and 12 June 2023)
  - Allgemeine Zeitung (5 June and 12 June 2023)
- LHU's ECC Renewal Application process and NamWater's proposed amendment application was advertised in the following newspapers (Market Watch section), informing interested and Affected Parties (I&APs) about the application process, availability of report and how to register as an I&AP:
- LHU continues to prepare Bi-Annual Environmental Management Progress Report for submission to MEFT. The last report that was submit was for the reporting period 1 July to 31 December 2022.
- No complaints or grievance were received during the previous Management Progress Reporting period. Also no complaint or grievance were received during 2023.

Independent water monitoring is carried out and quarterly reports are submitted to LHU. LHU amend these reports to include additional permit reporting requirements. The final reports are shared with Ministry of Agriculture, Water and Land Reform. The next report is being finalised.

### 3.1.2 GENERAL (THIRD PARTY) SAFETY AND SECURITY

#### 1) Access of unauthorised people to the ML

*Audit finding: C*

- LHU continues strict access control to the mine with the security control point and warning signs in place.

### 3.1.3 BIODIVERSITY (LINKED TO SURFACE WATER)

#### 1) Reduction of water resources as an ecological driver

*Audit finding: PC*

- Even though no activities relevant to the related management and mitigation measures were recently implemented, the rainfall event experienced in 2022 over the ML area showed a lack of clean surface water diversion measures are provided around infrastructure and activities to maintain the hydrology of the Gawib River.
- In the EMP it is recommended to “as far as possible avoid total destruction of the hydrology of the Gawib by keeping certain sections of the riverbed in tact and ensuring that restoration of mined out pits commences during the operations phase” and that “clean surface water diversion measures are provided around infrastructure and activities so that not all clean surface water flow is restricted/captured by mine infrastructure. Given physical geographical constraints, it is not possible to divert clean run-off around the mine and plant infrastructure in the centre of the ML”.

*Recommendations:*

- LHU to review and update the “site-wide” Stormwater Water Management Plan, considering all the relevant Management and mitigation measures in the EMP.

### 3.1.4 SURFACE WATER

#### 1) Clean and dirty water

*Audit finding: (no rating provided – see below)*

- Various refurbishment activities are currently being undertaken in and around the process plant to improve, amongst others, the clean and dirty water systems. The “process pond”, which was found to be leaking in the past will also be repaired (see photo 1). The effluent still contained in the process pond will first be drenched and disposed of in the TSF.



**Photo 1: Process pond to be repaired**

*Recommendations:*

- LHU to scrutinise the respective clean and dirty water systems as part of their current refurbishment activities to ensure the various commitments in the EMP will be adhered to when the processing activities commence.

2) General surface water pollution/ spills

*Audit finding: PC*

- Painting activities are conducted in dedicated areas - on temporary (plastic) lined areas to prevent spillage (see photo 2).
- Evidence of small hydrocarbon spillage found at the following areas: Diesel refuelling area, Hydrocarbon storage area (see photo 3).
- The 'old' waste oil storage facility will be decommissioned and a new area is being constructed.

- Even though a temporary dedicated (bunded area) for hydrocarbons are available, various containers with hydrocarbons are stored outside the bunded area posing a risk for more spillages (see photos 4 and 5).
- Sand blasting activities are conducted in a relatively shielded area. However, there are still signs of spillages of sand-blast material outside the area, posing a contamination risk (see photo 6).



**Photo 2: Painting area with lining to prevent spillage**



**Photo 3: Hydrocarbon spillage**



**Photos 4 and 5: Hydrocarbon storage – outside bunded areas**



### Photos 6: Sand-blasting area

#### *Recommendations:*

- LHU to ensure employees and contractors implement the commitments in the EMP relating to hydrocarbon storage, handling and disposal.
- Soil contaminated with hydrocarbons to be cleaned or treated, as per the EMP commitments.
- Improved the shielding around the sand-blasting area and clean up all spillage.

#### *3) Domestic effluent*

#### *Audit finding: PC*

- With reference to the EMP commitment "discharge of raw sewerage and grey water into appropriate sewage treatment facilities" the Sewage Treatment Plant (STP) is currently not working effectively due the sudden increase in people on the mine.
- LHU has appointed a contractors to address the problems



*Recommendations:*

- Ensure the problems with the STP are addressed soonest to avoid any spillage / discharge of effluent into to environment.
- LHU to monitor the STP activities.

**3.1.5 GROUNDWATER**1) Contamination of Groundwater*Audit finding: PC*

- LHU continues with groundwater monitoring. A summary of key findings from the latest (finalised) report, prepared by SLR Environmental Consulting (SLR, 2023) includes the following:
  - "A total of eleven (11) boreholes were sampled and analysed in January 2023.
  - Borehole (BH) XB22 shows uranium concentration of 0.54 mg/l, which is considered as pollution.
  - BH XB20 has increased in uranium concentration from 2.2 mg/l to 16.45 mg/l, which is a significant increase and a sign that the pollution plume is moving downstream.
  - Uranium concentration above background values has been detected in the paleochannel BH XB12. However, the concentration at this stage is only 1.1 mg/l above the natural/background values.
  - The illustrated pollution plume in Pit C shows the pollution flow path for XB16 and XB12, originating mostly from TSF3, but may possibly also be seeping from TSF2. Monitoring at XB09 and XB10 will provide further insight on the pollution plume's direction.
  - The management of water levels in the tailing storage facilities TSF2, TSF3 and TSF5 will have a direct impact on groundwater pollution downstream, as extensive pumping may retract the pollution plume. Thus the recommendation to continue vigorous pumping is maintained to curb further migration of seepage, pumping rate should be increased to reduce the groundwater level gradient away from the TDFs/mine pits, and thereby eliminating the downgradient migration of the pollution plume.
  - Access to monitoring boreholes XB09 and XB10 in Pit C has not been completed, it is re-iterated to have the access re-instated.

- The Piper Diagram characterises the groundwater type sodium chloride type water.
- With regard to the effluent analysis results, the TDS, COD, the absorbed oxygen, chlorine, free and saline ammonia, the TKN, and the ortho-phosphate concentrations are exceeding the general and acceptable standards set up in the relevant Acts.

*Recommendations:*

- LHU to ensure the recommendations from the above mentioned SLR report are prioritised as part of the mine “return the production” Project and implemented.
- Continue with the (independent) monitoring programme and ensure further corrective actions are implemented.

### 3.1.6 WASTE MANAGEMENT

1) Non-hazardous non-radioactive contaminated solid waste (non-mineralised)

*Audit finding: C*

- LHU continue to make use of the services of Rent-a-Drum to remove waste from site for safe disposal.
- Even though the EMP requires for recycling of waste (where relevant), this is currently not always possible – the reason being that there is currently no such facilities available for the recycling of all waste types (i.e. plastic, glass, etc.). This general service (historically) provided by Rent-a-Drum in the Erongo Region, recently ended. All non-hazardous (non-radioactive) waste (other than scrap metal) therefor gets disposed of at the general (Swakopmund) landfill. It is therefore not fully compliant with the EMP, however not in LHU’s control – therefore provided with the “Conformance” status.
- There are however some evidence of waste not properly disposed of (and separated) on site and proper waste receptacles were not found in all relevant areas.

*Recommendations:*

- LHU should continue to work closely with Rent-a-Drum (and other stakeholders, i.e. the Namibian Uranium Association and the Swakopmund Municipality) to address the ‘much wider problems of waste recycling and find solutions for future recycling of their waste.
- Ensure all waste is properly stored / separated (i.e. hazardous and non-hazardous waste) on site to ensure safe disposal off site and that all contractors and LHU employees are (continuously) made aware of the proper waste management requirements. Ensure sufficient waste receptacles are placed in the respective areas on site.

2) Hazardous non-radioactive contaminated solid waste (non-mineralised)

*Audit finding: C*

- Similar to the above mentioned challenges relating to recyclable waste, LHU currently faces the challenge of the Walvis Bay Waste Site not accepting any Hazardous Waste (other than hydrocarbon contaminated soil)<sup>1</sup>.
- All hazardous waste (non-radioactive contaminated) which should be safely disposed of off-site according to the EMP, is therefore currently stored on-site until the above mentioned issues with the (only) hazardous waste site in the Erongo Region have been addressed or an alternative arrangement made. Seeing that it is not in LHU's control, and this waste is not disposed of 'incorrectly', the audit findings is a "Conformance" status

*Recommendations:*

- LHU should continue to work closely with Rent-a-Drum (and other stakeholders, i.e. the Namibian Uranium Association and the Walvis Bay Municipality) to address the 'much wider problems of hazardous waste management and disposal and find solutions for future hazardous waste management.

3) Radioactive contaminated solid waste (non-mineralised)

*Audit finding: PC*

- With reference to section 2.2 the FPR is being dismantled and replaced with upgraded facility. The waste being generated from these activities are largely radio-active contaminated and disposed / 'stored' in dedicated areas on TSF 2.
- In one of the areas, the waste is placed in containers for future safe disposal on site (refer to Photo 7). On another area, the waste appears to be placed in an area which could pose environment risks, on the edge of the TSF (refer to photos 8). Also this areas is not well managed.

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<sup>1</sup> Note: This was not verified by Namisun.



**Photo 7: Radio-active contaminated waste stored in container on TSF2**



**Photo 8: Radio-active contaminated waste stored in the open on TSF2**

*Recommendations:*

- LHU should engage with a Radiological Specialist and (possibly) a Geo-hydrologist to obtain input regarding the current storage / disposal practices for a relevant large volume of Radio-active contaminated waste.
- Develop a plan for the current and future disposal of the Radio-active contaminated waste, taking cognisance of the Mine Closure and (likely) 'end disposal of this waste into one of the open pits.

### 3.1.7 GENERAL

#### 1. General Environmental Management

*Audit findings: PC*

- LHU continued with Environmental Management practices, i.e. relevant monitoring, reporting, etc. (at a 'reduced scale') throughout the Care-and-Maintenance phase and had an Environmental Manager on site, overseeing these activities.
- LHU was however without an Environmental Officer / Manager for some time (towards the end of 2022). An ESG Practitioner was appointed in October 2022.

- The Environmental Management requirements (i.e. relevant EMP commitments) continue to be monitored (where relevant) on site and as part of the mines 'return to production' project, the management system is being further developed and improved.
- The Environmental Permits are being kept up to date.
- As part of the construction / refurbishments activities on site, a system exists for inspections, logging of incidences, non-conformances being logged and corrective actions implemented.
- However, there is a lack of clear communication / training and (ongoing) awareness with the contractors regarding the implementation of the relevant commitments of the EMP. Evidence of the contractors' requirements to comply with the (relevant) EMP commitments are lacking.
- LHU has several logged incidents that the construction company (ADP) did not perceive as something needing to be logged. This is likely due to the fact that ADP group all their environmental related incidents under one 'category' in a system focusing mainly on safety. The incident registers therefore do not always match which could lead to difficulty in tracking all these incidences and closing them out.

*Recommendations:*

- LHU to ensure all Employees and Contractors are made aware of the relevant EMP commitments and ensure compliance with all.
- Increased efforts to inspect the site for environmental incidences and NCs (during the current "construction phase") are required to ensure effective corrective actions are developed, implemented and relevant improvements made – not only by the ESG Practitioner, but also other dedicated personal (part of the Construction Team and LHU employees).
- Continue to further develop and improve the management system to ensure effective implementation of all operations phases EMP commitments as soon as the mine becomes operational again.

## 4 SUMMARY AND CONCLUSION

LHU is in the process of renewing its ECC. Namisun has been appointed by LHU as the independent Environmental Assessment Practitioner to assist with the ECC renewal application for LHU. As part of the ECC renewal Application process, Namisun conducted an (independent) Environmental Audit of LHU's current activities at the mine, which forms the basis of this Report.

Namisun's scope of work entailed an environmental performance audit of the LHU against its EMP commitments, taking cognizance of the fact that the mine was under 'care and maintenance' since 2018, as well as the various construction / refurbishments activities currently being undertaken at the mine (i.e. process plant). Spot checks of the relevant areas where current activities are undertaken were done, largely at the process plant.

Key findings of the audit are summarised below. Recommendations relating to the various findings are provided in chapter 3 of the report.

- LHU continued with Environmental Management practices throughout the Care-and-Maintenance phase (at a 'reduced scale'). An ESG Practitioner was appointed in October 2022 to assist management, amongst others, to continue with relevant monitoring requirements as part of the mines 'return to production' project and further development and improvement of the environmental management system.
- Partial Compliances (PCs) found during the audit relate the following:
  - A review and update of the "site-wide" Stormwater Water Management Plan, considering all the relevant management and mitigation measures in the EMP are required to ensure compliance. One key measure highlighted, relates to the commitment for clean surface water diversion measures to be provided around infrastructure and activities so that not all clean surface water flow is restricted/captured by mine infrastructure.
  - Evidence of small hydrocarbon spillage found on site and uncorrected handling and storage of hydrocarbons, which could lead to further spillages.
  - Signs of spillages of sand-blast material outside the area, posing a contamination risk.
  - Various findings raised in the recent groundwater monitoring report relating to groundwater contamination.
  - Radioactive contaminated waste management (i.e. storage / disposal) practices relating to the dismantling of FPR.

- There is a lack of clear communication / training and (ongoing) awareness with the contractors regarding the implementation of the relevant commitments of the EMP.



## 5 REFERENCES

**METAGO ENVIRONMENTAL ENGINEERS (PTY) LTD. 2012. LHU ENVIRONMENTAL MANAGEMENT PLAN**

**SLR. 2023.** Langer Heinrich Uranium Mine Quarterly Groundwater Monitoring Report - January 2023