LANGER HEINRICH URANIUM (PTY) LTD
A Member of the Paladin Energy Ltd Group of Companies

LANGER HEINRICH URANIUM (PTY) LTD ENVIRONMENT MANAGEMENT PLAN

DATE: JULY 2020

LANGER HEINRICH URANIUM (PTY) LTD
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ENVIRONMENT MANAGEMENT PLAN

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EXECUTIVE SUMMARY

Purpose of report

Through this report Langer Heinrich Uranium (Pty) Ltd seeks renewal of its Environmental Clearance Certificate that was issued Clearance Certificate (ECC) issued in July 2017.

This feedback report has been compiled in adherence to:

- The reporting requirements as per the Langer Heinrich Uranium (Pty) Ltd (LHU) Environmental Clearance Certificate (ECC) issued in July 2017 as well as the LHU Environmental Management Plan.
- To provide feedback as per the Langer Heinrich Uranium (Pty) Ltd (LHU) Environmental Clearance Certificate (ECC) issued in July 2017 as well as the LHU Environmental Management Plan.
- This report replace the bi-annual report for the period 01 January 2020 to 30 June 2020 since all information for this period is reported and discussed in this report.

Reporting period

The information in this report provides feedback on progress against commitments made in the Environmental Management Plan (EMP) for the r period; 1 July 2017 – 30 June 2020.

Lay-out of this report:

This report (Langer Heinrich Uranium (Ltd) Pty. Environmental Management Plan July 2020) consist of three (3) Sections:

- Section A: Provides the background information of Langer Heinrich Uranium (Ltd) Pty and Langer Heinrich Uranium Mine.
- Section B: Provides information on the Operational activities undertaken and Environmental Performance for the period 01 July 2017 and 30 June 2020.
- Section C: Provides the revised Environmental Management Plan.

Environmental Management Performance Feedback

Fifteen (15) management and mitigations programs were identified to drive the EMP implementation for Langer Heinrich Mine (LHM). These 15 Environmental management and mitigation programs (EMMP's) have been developed and implemented in accordance with the International Organisation of Standardisation (ISO) 14001:2004 / South African National Standard (SANS) 14001: 2005 environmental management system requirements, which is based on a process of continual improvement. Below follows a summary on the progress against EMMP commitments.

Management and Mitigation Program	Potential significant impacts / issues of concern	Management objectives and commitment	Status of commitments
Air Quality	**Error! Reference source not found.** Gaseous emissions	Prevent unacceptable air quality related pollution impacts to Bloedkoppie and the on-site temporary driller's camp.	Implemented
Biodiversity	Loss or degradation of fauna and flora Loss or degradation of plant and animal habitats Separation of upstream and downstream systems Destruction of hydrology Decrease in the water table Over abstraction of the groundwater	Prevent or limit the unacceptable loss of biodiversity and related functionality, a reduction in key ecological drivers of groundwater and temporary surface water flow. Achieve compliance to abstraction permit	Implemented
Surface Water	Alteration of drainage patterns Contamination of surface water run-off	Prevent degradation of surface water quality, alternation of drainage patters and in the event of a flood manage storm water. Achieve compliance to Waste water and effluent disposal exemption permit.	Implemented
Ground Water	Loss of Groundwater to Swakop River farmers and vegetation (dewatering) Contamination of Groundwater water	Minimise the environmental impact on groundwater quality and quantity as a result of LHU mine activities and products use that the surrounding ecosystem functions are within baseline ranges. Achieve compliance to abstraction permit Achieve compliance to Waste water and effluent disposal exemption permit.	Implemented
Resource use	Depleting resources (Water, manufactured material, Hydrocarbons, Electricity) Accidental resource (Hydrocarbons, water, manufactured material) release may result in contamination.	Monitor the consumption of resources and find ways to minimize consumption, optimise usage and ensure efficient use of resources. Adhere to Park Permit conditions	Implemented
Waste	Pollution of land, soil, ground and surface water Depletion of resources Nuisance Visual impacts	Ensure proper storage, removal, transportation, monitoring and disposal of non-mineralised waste Achieve compliance to Waste water and effluent disposal exemption permit Adhere to Park Permit conditions Ensure proper design, stockpiling, handling and monitoring of mineralised waste to prevent pollution. Achieve compliance to Waste water and effluent disposal exemption permit Adhere to Park Permit conditions	Implemented
Soil	Soil Pollution Soil erosion	Minimize the loss of soil as an ecological resource and limit the impacts on soil functionality.	Implemented
Visual	Visual disturbance Aesthetic impacts to final land forms	Limit visual impacts to views from Bloedkoppie and the Swakop River battlefields Adhere to Park Permit conditions	Implemented
Archaeology	Disturbance to archaeological and heritage sites Loss of archaeological and heritage information	Prevent the unacceptable loss of archaeology and cultural sites. Adhere to Park Permit conditions.	Implemented
Noise and Vibration	Noise pollution from blasting Vibration from blasting	Limit excessive noise and vibration impacts to visitors at Bloedkoppie and the near the Swakop River boreholes. Adhere to Park Permit conditions.	Implemented
Safety and Security	Physical harm to third parties and animals	Avoid Mine site access by unauthorised people. Adhere to Park Permit conditions.	Implemented
Radiological	Radiation health impacts	Prevent radiation related health impacts	Implemented
Socio-Economic	Employment creation Local economic development Stakeholder consultation Social wellbeing and community development	Enhance positive socio-economic impacts and limits the negative impacts	Implemented
Rehabilitation and Restoration	Failure of Rehabilitation	Successfully rehabilitate all disturbed areas resulting from mining activities.	Implemented

LANGER HEINRICH URANIUM MINE
ENVIRONMENTAL MANAGEMENT PLAN

SECTION A

BACKGROUND INFORMATION

1. DEFINITIONS AND ABBREVIATIONS

1.1. Definitions

Biological diversity refers to the variability among living organisms from all sources, including amongst others, terrestrial and aquatic ecosystems and the ecological complexes of which they are part, and this includes diversity within species, between species and of ecosystems; (Environmental Management Act, No 7 of 2007).

Environment is a complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life – including; (a) the natural environment being land, water and air, all organic and inorganic material and all living organisms; and (b) the human environment being the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values (Environmental Management Act, No 7 of 2007).

Environmental Aspect comprises all elements of an organisation's activities, products or services which can interact with the environment (ISO 14001).

Environmental Impact refers to any change to the environment, whether adverse or beneficial, wholly or partly resulting from an organisation's activities, products and services (ISO 14001).

Environmental Management System (EMS) is that part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects (ISO 14001).

Environmental Management Plan (EMP) refers to a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored. (Environmental Impact Assessment Regulations: Environmental Management Act, 2007).

Environmental Objective is an overall environmental goal, consistent with the environmental policy, that an organization sets itself to achieve (ISO 14001).

Environmental Policy is a statement by an organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets (ISO 14001).

Environmental Targets details performance requirements, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives (ISO 14001).

Hazardous Substances includes any substance or mixture of substances declared hazardous in terms of section 3(1) of the Hazardous Substances Ordinance 14 of 1974 or in terms of any other legislation which may be enacted to provide for the control of hazardous substances (Environmental Management Bill, 2002).

Hazardous Waste refers to a hazardous substance that is no longer of use to the organisation and which needs or be disposed of in the appropriate manner (Environmental Management Bill, 2002).

Pollution means the direct or indirect introduction, as a result of human activity, of substances, vibrations, heat, radiation or noise into the air, water or land which may be harmful to human health or well-being or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment (Environmental Management Bill, 2002).

Waste means any substance or thing that the holder discards or disposes of, or intends or is required to discard or dispose of, irrespective of its value to any person, and any substance or thing deemed by regulations to be waste (Environmental Management Bill, 2002).

1.2. Abbreviations

ABBREVIATION	MEANING
bcm	Bank cubic metre
BRP	Bicarbonate Recovery Plant
BFS	Bankable Feasibility Study
CCD	Counter Current Decanter
CNNC	China National Nuclear Corporation
°C	Degrees Celsius
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
EAR	Environmental Assessment Report
EC	Electrical Conductivity
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
ELR	Environmental Legislation Register
EMP	Environmental Management Plan
EMMP	Environmental Management and Mitigation Plan
EMS	Environmental Management System
EPL	Exclusive Prospecting License
Env	Environment
ha	Hectares
H_2O_2	Hydrogen peroxide
H_2SO_4	Sulphuric aid
HBC	Husabberg Compartment
HDPE	High density Polyethylene
HFO	Heavy fuel oil
HOD	Head of Department
IAEA	International Atomic Energy Agency
ISO	International Organization for Standardization
IX	Ion exchange
km	kilometre
KMCC	Karibib Mining and Construction Company
kg	kilogram
LOM	Life of Mine
LHM	Langer Heinrich Mine
LHU	Langer Heinrich Uranium
LHUPL	Langer Heinrich Uranium (Pty) Ltd
LHC	Langer Heinrich Compartment
mamsl	meters above mean lea level
MCE	Maximum credible earthquake
MAWF	Ministry of Agriculture and Water
METF	Ministry of Environment, Tourism and Forestry
MG	Medium Grade
ML	Mine Licence
ML 140	Mining Licence 140
ML 172	Mining Licence 172
MME	Ministry of Mines and Energy
MOHSS	Ministry of Health and Social Services
Mtpa	Million tonnes per annum
Mlbs	Million pounds
Na_2CO_3	Sodium Carbonate
Na_2U2O_7	Sodium diuranate
$NaHCO_3$	Sodium Bicarbonate

ABBREVIATION	MEANING
NaHO	Sodium hydroxide
NamWater	Namibia Water Corporation Ltd
NamPower	National power utility company of Namibia
NNNP	Namib Naukluft National Park
NRPA	National Radiation Protection Authority of Namibia
Paladin	Paladin Energy Limited (ASX: PDN)
pH	Potential of hydrogen
PLS	Pregnant leach solution
PM10	Particulate Matter 10
RMP	Radiation Management Plan
ppm	part-per million
RO	Reverse Osmosis
RoM	Run of Mine
RSO	Radiation Safety Officer
SANS	South African National Standard
SDU	Sodium Diuranate
SHER	Safety, Health, Environment and Radiation
STP	Sewerage treatment Plant
SO_2	Sulphate
TDS	Total Dissolved Solids
TSF	Tailings Storage Facility
U	Uranium
U_3O8	Uranium Oxide
UO4:2H2O	Hydrated uranyl peroxide
USGS	United States Geological Survey
WBG	World Bank Group
WRD	Waste rock dump

A. BACKGROUND INFORMATION

This section provides the background information on Langer Heinrich Uranium (Ltd) Pty (LHU) and Langer Heinrich Uranium mine (LHM). The following information is presented and discussed:

- Location and ownership of LHU
- Background regarding Environmental approvals
- The scope of this EMP.

A.1. LOCATION AND OWNERSHIP

Located approximately 80km east of Swakopmund in the Erongo region of Namibia, Langer Heinrich Uranium (Pty) Ltd (LHU) operates a conventional open pit uranium mine entirely located within the Namib Naukluft National Park (NNNP), as can be seen below (Figure 1).

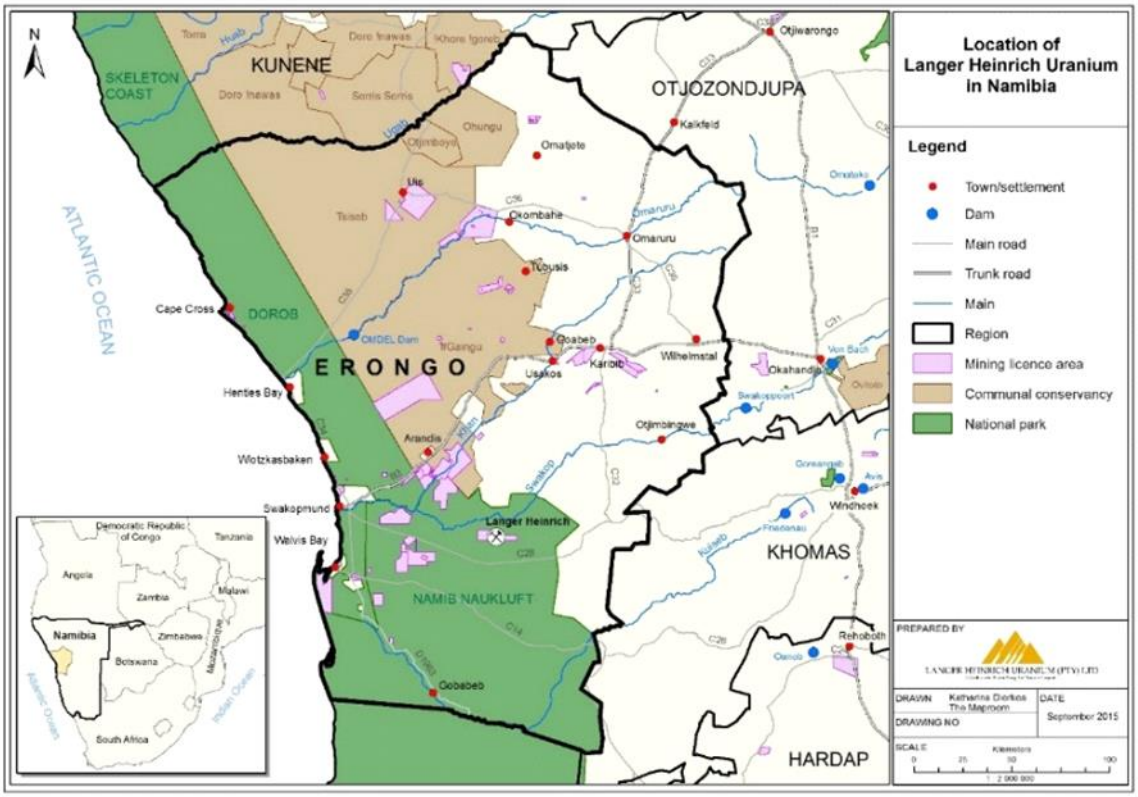


Figure 1: Location Langer Heinrich Uranium mine LHM) in Namibia

Current active operations are confined to ML140, whilst approval of the conversion of EPL3500 to ML172 was obtained from the Ministry of Mines and Energy (MME) in July 2015.

A mine access road (about 25km long) joins the existing C28 road which connects Windhoek with Swakopmund via the Bosua Pass and Namib-Naukluft National Park (NNNP) (Figure 1). The site has existing water and power connections provided by NamWater and NamPower respectively. The NamWater pipeline (and related infrastructure) runs alongside the C28 for about 50km and then branches off to follow the mine access road to site. The section of water

pipeline adjacent to the C28 is located above ground, whilst the section adjacent to the mine access road is underground. The power line infrastructure to LHM runs from the Kuiseb Substation in Walvis Bay to the mine access road, from there it runs parallel with the access road to the mine site. There is also an above ground water pipeline and associated gravel track between the Swakop River boreholes and ML140, running west alongside the Langer Heinrich Mountain towards the operations area.

The mine lease is entirely surrounded by the Namib-Naukluft National Park, which at 49,768km^2, is the third largest game park in Africa. The nearest boundary of the Park (to the north) is about 15km away. This boundary also indicates the location of the nearest commercial farm Modderfontein, i.e. the nearest neighbour. The northern parts of the Park include large tracts of land without any road access. A small piece of land within the Park, close to the current LHU Swakop River abstraction borehole WW41183, is privately owned. This land, referred to as the Riet Farm, can never be developed although the owner has access to the land for camping and other non-intrusive activities.

Bloedkoppie a popular camping site is located approximately 7km south east from the current operational area of the mine and approximately 1km from the eastern boundary of ML 140 (Figure 2). For Bloedkoppie visitors, access via the mine access road is not permitted, but only from the C28 in the south. East of ML 140, German graves (approximately 10km away from current operations) occur, while the remains of a Second World War battlefield is located near the pipeline route to the Swakop River (approximately 15km from ML 140). Further afield (between 30 and 50km) the Welwitschia plains and the Moon Landscape are popular tourist attractions. The locations of the aforementioned sites are provided on Figure 1 and Figure 2.

The mining operation is located at an elevation of 678 meters above mean sea level (mamsl) within the broad, flat valley of the ephemeral Gawib River, at a section between the Langer Heinrich Mountain and Schieferberg as indicated below (Figure 2).

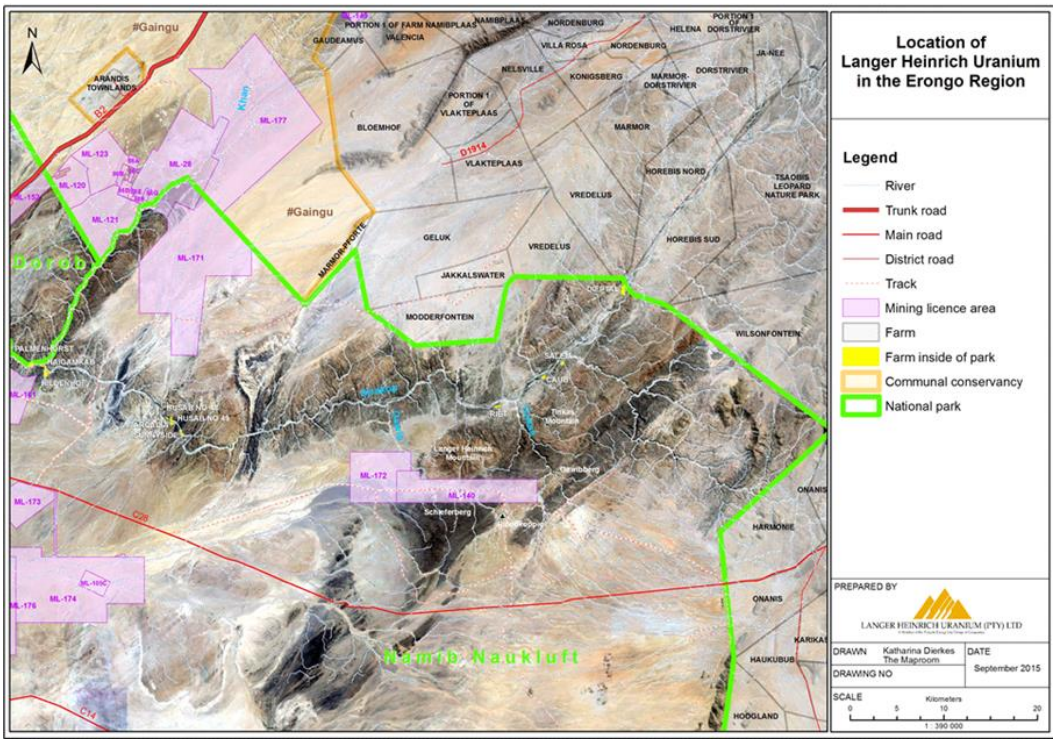


Figure 2: Location of ML140 and ML172 in relation to the regional context

The coordinates of the ML 140 and ML 172 are respectively provided in Table 1 and Table 2 the physical locations is indicated on Figures 1 and 2 above.

Table 1: Coordinates of ML 140

No	Longitude Degree	Longitude Minute	Longitude Second	Direction	Latitude Degree	Latitude Minute	Latitude Second	Direction
1	15	16	21.83	E	22	47	40.27	S
2	15	17	49.49	E	22	47	40.13	S
3	15	17	49.56	E	22	48	9.36	S
4	15	25	7.86	E	22	48	8.39	S
5	15	25	8.11	E	22	49	29.68	S
6	15	16	22.04	E	22	49	30.83	S

Table 2: Coordinates of ML 172

No	Longitude Degree	Longitude Minute	Longitude Second	Direction	Latitude Degree	Latitude Minute	Latitude Second	Direction
1	15	16	22.05	E	22	49	30.85	S
2	15	13	26.51	E	22	49	30.85	S
3	15	13	26.51	E	22	46	35.31	S
4	15	17	14.51	E	22	46	35.31	S
5	15	17	14.51	E	22	47	40.31	S
6	15	16	21.84	E	22	47	30.83	S

The Langer Heinrich Uranium deposit was discovered in 1973 after a government-sponsored airborne radiometric survey of the area. Between 1974 and 1980, General Mining Union Corporation Limited (Gencor) undertook extensive evaluation work (exploration and trial mining) in order to better define the ore resource. Following a fall in the prevailing uranium price in the mid-1980's prospects on the world uranium market remained poor resulting in the suspension of further work on this project.

Acclaim Uranium NL acquired this project from Gencor in 1998 and completed a pre-feasibility study between 1999 and 2000. This project was again put on hold due to prevailing uranium prices. In August 2002, the Paladin Energy Limited (ASX: PDN) (Paladin) acquired Langer Heinrich Uranium (Pty) Ltd (LHU) and its assets from Aztec Resources Ltd (formerly Acclaim Uranium NL).

In June 2014, Paladin announced that it had signed an agreement to sell a 25% joint-venture equity stake in its flagship Langer Heinrich uranium mining operation in Namibia to China National Nuclear Corporation (CNNC).

Langer Heinrich Uranium (Pty) Ltd (LHU) remains the holder of two Mining Licences (MLs) as presented below (Table 3).

Table 3: Title Deed Details

Title Number	Title Holder	Date Issued	Area (Hectares)	Expiry Date
ML140	LHU Company Registration Number 73/01772	25/07/2005	4,375.00	26-Jul-30
ML172		24/06/2015	2,999.20	23-Jun-40

Details of LHU's Board of Directors is presented below (Table 4).

Table 4: Details of LHU Board of Directors

Position	Name and Surname	Citizenship
Chairman	Ian Purdy	Australian
Executive Director	Johan Roux	Namibian
Non-Executive Director	Sebulon Kankondi	Namibian
Non-Executive Director	Shangxiong Gao	Chinese

A summary description of Langer Heinrich Uranium Mine (LHM) development phases and status is presented below (Table 5).

Table 5: Development phases and status of Langer Heinrich Uranium Mine (LHM)

Year	LHM development phase and status
2005	Construction at the Langer Heinrich project commenced in September 2005.
2006	Staged commissioning of the plant began in August 2006.
2007	LHM commenced production in 2007 with a capacity of 2.7Mlbpa.
2008	Construction of the Stage 2 expansion to 3.7Mlbpa commenced.
2009	LHM reached the State 2 design capacity in December 2009.
2012	Construction of the Stage 3 expansion to 5.2Mlbpa commenced at the beginning of 2010 and was completed on 31 March 2012.
2014	On 23 July 2014 the sale process for a 25% interest in LHM to CNNC was completed.
2015	Process innovation focused on the Bicarbonate Recovery Plant (BRP) which was commissioned in early March 2015 and resulted in significant reagent cost reductions.
2016	Following the continued decline in uranium prices, LHM introduced a mining curtailment strategy in November 2016.
2018	In May 2018 the Company placed LHM into care and maintenance (C&M) due to the sustained low uranium spot price and successfully transitioned the mine to full C&M in August 2018.
2019	In February 2019 the Company commenced a Prefeasibility Study to further refine and verify the LHM to restart plan.
2020	LHU is Care and Maintenance Phase

A.2. BACKGROUND REGARDING ENVIRONMENTAL APPROVALS

A.2.1. Documentation Submitted During the Approval Processes

The relevant documents submitted to the relevant Namibian Government authority notifying and seeking environmental approval regarding the initial Mining Licence (ML) application (mining & processing activities) as well as expansion projects to date is listed below:

- 2005: An Environmental Assessment Report (EAR) (Softchem, 2005).
- 2005: Environmental Management Plans for both the construction and operational phases (Speiser, 2005).
- 2005: A Bankable Feasibility Study (BFS) (GRD-Minproc, 2005).
- 2006: An Accessory Works Plan (2006).
- 2006: A Mine Contract Plan (GRD-Minproc, April 2006).
- 2008: An amended Environmental Management Plan (LHM, 2008) to cater for expansion activities.
- 2009: An Environmental Impact Assessment Report (Metago, 2009) for the 2009 Environmental Impact Assessment conducted.
- 2011: An Environmental Impact Assessment Report (Metago, 2011) as well as the Environmental Management Plan for the 2011 EIA (current and future stage 4 expansion project and EPL 3500 conversion activities).
- 2017: Renewal of Environmental Clearance Certificate (ECC) for the Stage 4 expansion project and the conversion of the EPL 3500 to ML 172.

A.2.2. Environmental Authorisation Granted

LHM has been issued with, amongst others, the following environmental authorisations (relating to the initial ML 140 application - mining & processing activities, as well as expansion projects to date and EPL 3500 conversation into ML172).

- Mining Licence 140 (ML 140) covering the Langer Heinrich deposit for a 25-year term, commencing 26 July 2005.
- An Environmental Clearance Certificate was granted for ML140 in August 2005.
- The Environmental Management Plans for both the construction and operational phases were approved and a pro-forma contract was signed in April 2006.
- An Exclusive Exploration Licence 3500 (EPL 3500) in was granted in 2007.
- An Environmental Clearance Certificate was awarded to LHM in October 2008 for the updated EMP (stage 2 expansion)
- An Environmental Clearance Certificate was awarded to LHM in November 2009 for the Stage 3 expansion project (Stage 3 EIA and EMP).
- An Environmental Clearance Certificate was awarded to LHM in November 2012 for the Stage 4 expansion project (Stage 4 EIA and EMP).
- Conversion of the EPL 3500 into Mining Licence 172 (ML 172) for a 25 year term, commencing 24 June 2015.
- 2017: Renewal of the Environmental Clearance Certificate (ECC) granted for the Stage 4 expansion project and the conversion of the EPL 3500 to ML 172.

A.2.3. Keeping EMPs Current

In the introduction to the first EMP for operations (ASEC, 2005), it indicated that:

''this should be seen as a 'living document' which will be amended during the operation, as activities might change or new ones be introduced.''

This is in keeping with Section 50 (g) of the Minerals (mining and Prospecting) Act, 33 of 1992, which states that the holder of a mining license shall undertake the periodic review of the EMP(s) should circumstances change.

LHU has seen a number of changes in its operations. The 2009 EIA and 2011EIA considered all impacts in a cumulative manner such that the impacts of the current activities and those potentially associated with the mining operation were discussed and assessed together, allowing for improved management and mitigation measure to be develop.

This EMP is an internal revision to align it to current preservation of asset status as to date of this report.

This EMP, the 5'Th revision to the mine's EMP, has been amended to reflect the current operational activities and products. It should therefore be read in the context of the 2011 and 2012 EIA's.

A.2.4. Required Information for EMP

On request of the Ministry of Environment, Forestry and Tourism: Directorate of Environmental Affairs (DEA), the EIA regulations (2012) have been used as a guideline for this EMP. The required components of the EMP is described below (Table 6).

Table 6: Required information for Environmental Management Plan (EMP)

EIA Regulation requirement	Reference in the EMP
Details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section A.2.5
Information on any proposed management or mitigation measures to address the environmental impacts that have been identified in a report contemplated by these regulations, including environmental impacts or objectives in respect of – i. Planning and design ii. Pre-construction and construction activities iii. Operation or undertaking of the activity iv. Rehabilitation of the environment v. Closure, where relevant	Section C– MMP C.2.5.1 to MMP C.2.5.13
A detailed description of the aspects of the activity that are covered by the EMP.	Section B Section C
An identification of the persons to be responsible for the implementation of the mitigation measures.	Section C2.5.1 – C2.5.13 and C.3.1 – C.3.4
Where appropriate, time frames within which the measures contemplated in the EMP must be implemented.	Section C (relevant MMP's)
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section C (relevant MMPs)

A.2.5. Details of Person Who Updated This EMP

Frances Anderson (LHM, Occupational Health, Safety, Environment and Radiation Manager) have reviewed and updated this prepared this fourth amended LHM EMP.

Frances Anderson has more than twenty years of relevant experience in Environmental Management including management and implementation of EIAs and the development of Environmental Management Plans.

A.3. SCOPE OF THE EMP

A.3.1. Background and Scope:

This Environmental Management Plan (EMP) has been reviewed to keep it current. This EMP provides a description of the activities and associated environmental impacts relating to the current LHU activities and surface infrastructure and the infrastructure associated with the Stage 4 expansion project and ML 172. Do note that not all the new infrastructure approved by the Stage 3 and Stage 4 project expansions has been constructed, but they form part of the permitted baseline for the site and are therefore included in this revised EMP.

LHU operates an Environmental Management System (EMS) which is based on the requirements of ISO 14001. A requirement of ISO 14001 is the development and implementation of an EMP. This is the fifth update of the initial EMP submitted in 2005.

This EMP continues to set out the framework, objectives and targets for sound environmental management. The intent of this EMP is that it is a dynamic document subject to regular review and continual improvement. This EMP will be reviewed and updated to reflect significant changes in LHU environmental.

A.3.2. Purpose

The purpose of this EMP is to facilitate the implementation of appropriate environmental protection and impact mitigation processes and techniques throughout the different phases (construction, operation, care and maintenance, decommissioning and final closure) of Langer Heinrich Uranium.

A.3.3. Objectives

The objectives of the EMP are to:

- Provide practical and achievable environmental plans in order to meet requirements
- Provide LHU and the relevant stakeholders with a framework to confirm regulatory compliance
- Provide the relevant stakeholders with the evidence that LHU operates in an environmentally responsible manner.

A.3.4. Excluded

The following documents are available upon request and is therefore not included in this EMP:

- Radiation Management Plan
- Social Management Plan
- Draft Closure Management Plan

LANGER HEINRICH URANIUM MINE
ENVIRONMENTAL MANAGEMENT PLAN

SECTION B

APPROVED INFRASTRUCTURE, FACILITIES, OPERATIONAL ACTIVITIES AND RESOURCES USED DURING DIFFERENT PHASES OF THE MINE LIFE.

B. ENVIRONMENTAL PERFORMANCE: 01 JULY 2017 AND 30 JUNE 2020

This section provides the background information on Langer Heinrich Uranium (Ltd) Pty (LHU) Environmental Performance between 01 July 2017 and 30 June 2020. The following information is presented and discussed:

- The approved infrastructure, facilities, activities and products is presented in this section.
- Operational activities undertaken between 01 July 2017 and 30 June 2020.
- Feedback on the environmental performance between 01 July 2017 and 30 June 2020

B.1. SUMMARY OF APPROVED INFRASTRUCTURE AND FACILITIES

A summary of some of the current approved infrastructure in used at LHM is presented in Table 7 below.

Table 7: Summary of current approved LHM Infrastructure and Facilitates.

Approved Infrastructure and Facilities	
Road infrastructure	Ministry of Environment and Tourism Parks Mine Access Road
	Internal Mine Lease Roads
	Haul Roads
	Swakop River Bore hole Road
Site Water Infrastructure	NamWater Water Storage Tanks
	NamWater Pipelines
	NamWater Booster Station
	Fresh Water Bladders
	Fire Water Storage Tank
	Fire Water Storage Tank Pipelines and Pumps
	Swakop River Groundwater Abstraction Pump Station
	Swakop River Groundwater Holding Tanks
	Swakop River Groundwater Abstraction Generator
	Swakop River Groundwater Pipelines
	Turkey's Nest Dam Facility
	Turkey's Nest Dam Pumps and Pipelines
	Brine Water Storage Facilities
	Brine Water Storage Facilities Pumps and Pipelines
	Rainfall run-off and Storm Water storage pits
	Reverse Osmosis Facility
	Processed Water Pond Facility
	Processed Water Pumps and Pipelines
	Rainfall and Storm Water Run-off Pit
	Rainfall and Storm Water Run-off Pit Pumps and Pipelines
	Coffer Dams
	Water cut-off Trenches and Pumps
	Seepage recovery Sumps
	Seepage recovery Pipelines and Pumps
	Open Pit Dewatering Facilities inclusive of Pipelines, Pumps and Sumps
Site Energy Infrastructure	NamPower Electrical Substation
	Power Lines
	LHU Electrical Substation
	Fuel (Diesel and Petrol) Storage Facilities
	Petrol Stations
	Diesel and Petrol Pipelines
	Boiler House
	Diesel Generators (Fix and Mobile)
	Bioremediation Facility
	Oil Separator
Blasting Facilities	Explosive Magazine
Pits, Voids and Trenches	Open Mine Pits
	Back Filled Mined Pits
	In-filled Mined Pits
	Borrow Pits
	Drilling Holes
	Trenches
Tailings Storage Facilities	Temporary Tailings Storage Facilities
	Above Ground Tailings Storage Facilities
	In-pit Tailings Storage Facilities
	Tailings Pumps and Pipelines
	Magra

Approved Infrastructure and Facilities	
Geological Material Facilities	Ore Stock Piles (Low, Medium, High and Super-grade)
	Run of Mine Facility (ROM-pad)
	Top-soil Stock Piles
	Sub-soil Stock Piles
	Waste Rock Dumps
	Barren Stock Piles
Processing Plant	Ore Crushing, Scrubbing and Classification Plant Facility
	Metallurgical Ore Processing, Concentration and Recovery Plant Facility and Infrastructure
	Bicarbonate Recovery Plant and Facilities
	Final Product Drumming Area
	Freshwater, Industrial water, Supernatant liquid, Process Solution Pipes
	Hazardous Chemical make-up and Storage Tanks
	Sealed Sources
	Conveyer Belts
	Pumps
Ancillary Facilities	Sewerage Treatment Plant
	Mobile Toilets and Fixed Toilets
	Ablution Facilities
	Change Houses
	Laundries
	Site Clinic
	Metallurgical Laboratory
	Research and Development Laboratory
	Stores and Warehouse
	Workshops (Mining, Maintenance and Engineering)
	Motor Vehicle Workshops
	Offices
	Salvage Yards
	Laydown Yards
	Geological Ore Sampling Storage Facility
	Exploration camp site
	Contractor lay-down area
	Plant Site Nursery
	Bus and Vehicle Parking Facility
	Weighbridge
	Security Flood lights
	Low Level Radio-active waste disposal sites
	General and non-radioactive hazardous temporary waste storage areas
Boreholes	Exploration Boreholes
	Monitoring Boreholes
	Production Boreholes
Not all the new infrastructure approved by the Stage 3 and Stage 4 expansions has been constructed, but they form part of the permitted baseline for the site and are included	Satellite mine workshop;
	Additional crushing and scrubbing capacity at the satellite location to the west of the permanent TSF;
	Temporary construction camp
	An additional processing plant on site (to increase production of uranium oxide to 8.7Mlbpa) with the infrastructure as indicated in the approved stage 4 EIA
	Evaporation pond infrastructure as indicated in the approved stage 4 EIA
	Heap Leach Facility and associated infrastructure as indicated in the approved stage 4 EIA
	Tailings Re-treatment Plant and associated infrastructure as indicated in the approved stage 4 EIA
	Coarse Rejects Wash Plant and associated infrastructure as indicated in the approved stage 4 EIA.
	New Waste Rock Dumps will be located in the eastern part of the ML140 and the western part of ML 140 and ML 172

Approved Infrastructure and Facilities	
	Relocation of infrastructure as indicated in the approved stage 4 EIA
	Additional required surface infrastructure as indicated in the approved stage 4 EIA
	A second Freshwater pipeline that will run parallel to the existing freshwater pipeline which serves LHM infrastructure as indicated in the approved stage 4 EIA
	Upgrade Power Supply and associated infrastructure as indicated in the approved stage 4 EIA

B.2. LOCATION OF FACILITIES AND INFRASTRUCTURE

The location of current infrastructure and facilities at Langer Heinrich Mine (LHM) is presented on the below (Figure 3).

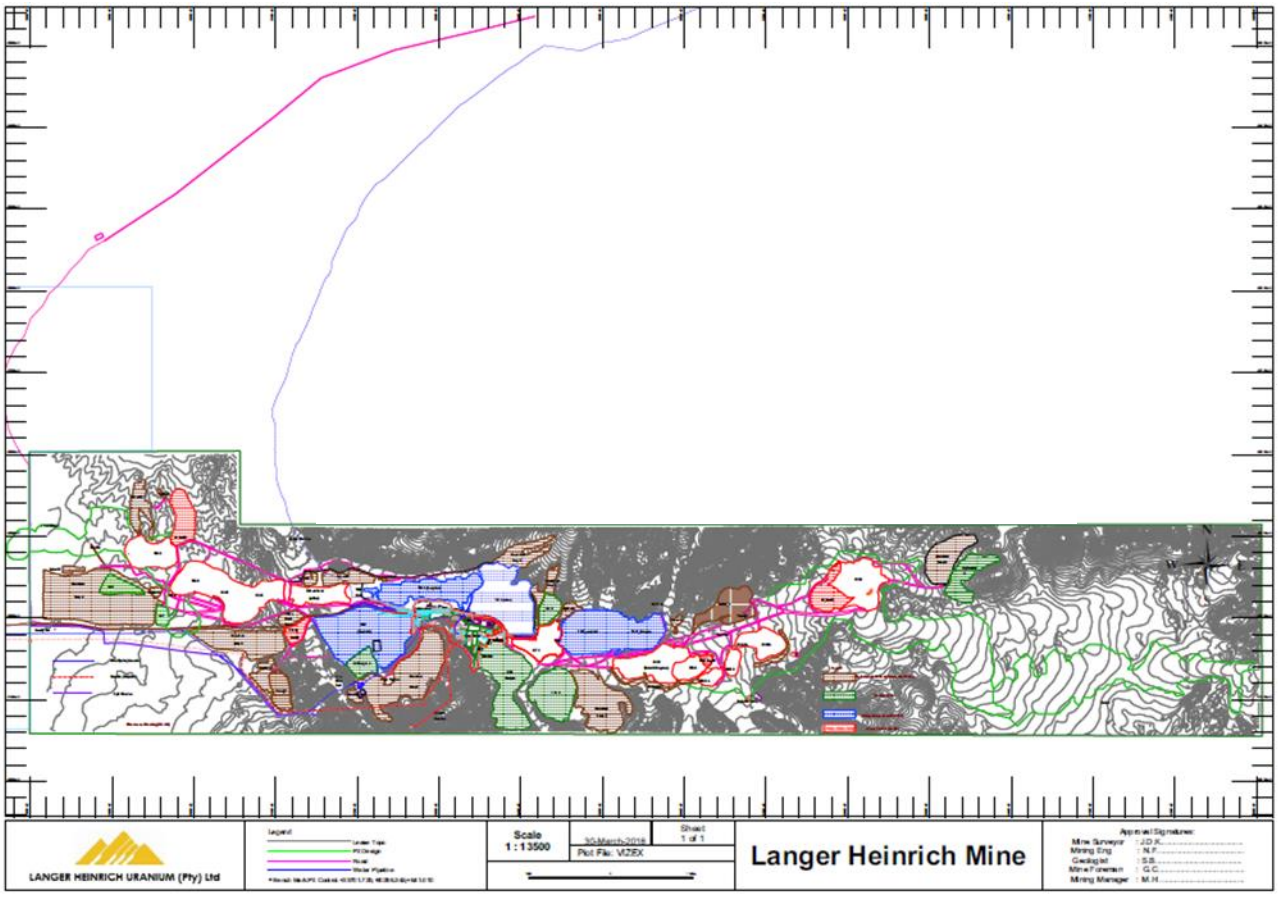


Figure 3: Location of infrastructure and facilities at LHM mine at June 2020.

Legend:

Red – Mining pits

Green – Stockpiles

Blue – Tailings

Brown – Waste and topsoil stockpiles

Green line- Pit layout (boundaries of pit)

B.3. OPERATIONAL ACTIVITIES UNDERTAKEN DURING DIFFERENT PHASES

B.3.1. Exploration and Drilling

Exploration and drilling work was historically undertaken by external contractors. This exploration and grade control during was undertaken for grade control purposes to better define the ore body prior to mining. Drilling occurred on ML140 and ML172 was conducted to define the exact shape and geographic location of the potential Uranium and Vanadium resources in the ground. This work was undertaken in previously disturbed areas and no new land was disturbed during this drilling. The drilling included Diamond Core (DC) drilling and Reverse Circulation (RC) drilling. The DC drilling was done to sample some of the tailings rock flower and the RC drilling was done to sample the remainder of native material.

Drilling activities during care and maintenance phase involved targeted resource definition drilling work undertaken by Namibian owned drilling companies Stewardship Drilling who employ Namibian employees. Drilling occurred between July 1 2019 and 25th July 2019 for a total of 5,079m (DC ≈ 162m and RC ≈ 4,917m).

Drilling equipment was owned by the contractor and demobilised upon completion.

B.3.1.1. Mineral Resources and Ore Reserves Estimations

Figures for Mineral Resources and Ore Reserves detailed below were compiled by David Princep of Gill Lane Consulting from Paladin Annual Reports and ASX announcements Mr. Princep is a Fellow of the Australasian Institute of Mining and Metallurgy and a Chartered Professional Geologist. Mr. Princep has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC 2012). Mr Princep approves of and consents to the inclusion of the information in this announcement in the form and context in which it appears.

Langer Heinrich Uranium Ore Reserves (as published by Paladin at April 2020) to the JORC (2012) code are detailed below (Table 8).

Table 8: Langer Heinrich Uranium Ore Reserves Estimations at 30 June 2019.

Ore Reserves	Mt	Grade ppm U_3O_8	Mlb U_3O_8	Paladin Ownership (%)	Paladin Attributable (Mlb)
Proven	42	525	48.5	75	36.4
Probable	13.1	489	14	75	10.5
Stockpiles	30.8	355	24	75	18.0
Total Namibia	**85.9**	**455**	**86.5**	**75**	**64.9**

Langer Heinrich Mineral Resources (as published by Paladin at April 2020) to the JORC (2012) code are detailed below (Table 9).

Table 9: Langer Heinrich Mineral Resources Estimations as at 14 October 2019.

Mineral Resources	Mt	Grade ppm U_3O_8	Mlb U_3O_8 (100% basis)	Paladin Ownership (%)	Paladin Attributable (Mlb)
Measured	66.2	490	71.9	75	53.9
Indicated	18.8	435	18	75	13.5
Inferred	6.3	420	5.8	75	4.4
Stockpiles	30.8	355	24	75	18.0
Total Namibia	**122.1**	**445**	**119.7**	**75**	**89.7**

B.3.2. Mining

The mining method used has been conventional truck and excavator open pit mining and the shape of the deposit means that the operation shares similarities with strip mining in that mining operations will move along a paleovalley. Material movement previously averaged 875,000 BCM/month, of which 120,000 BCM was ore (cut-off grade 450ppm U_3O_8). Specific density used to convert BCM to tonnes is 2.4t/m3.

Mining was done by the contractor KMCC which is part of the Moolman Group which, in turn is owned by Aveng. KMCC had 370 contractors on site plus another 50 sub-contractors mainly in the blasting and equipment maintenance areas. All mining activities ceased at 13 May 2018 when operations went onto care and maintenance.

The ore was mined in a channel running east to west along a strike of approximately 15km. Mining has occurred in a series of pits which was 30m to 80m deep. Design wall angle is 70º batter with a 5m berm for the top portion and 50º once the old water table is reached. The total overall wall angle is 35º. Bench height is 9m, and mining is done in 3m flitches.

Haul roads are designed to a width of 22m which is 3.5 times the truck width and a gradient of 10%.

The operation is selective in terms of separately mining high (>650ppm), medium (450-650ppm) and low grade ore (250-450ppm) and waste. From December 2014, waste has been mined selectively as mineralised waste (100-250ppm U_3O_8) and clean waste (<100ppm U_3O_8). The degree of selectivity upon which the dilution and ore loss allowances are based reflects the scale of mining equipment, the proposed grade control method and the nature of the mineralisation. The mine uses blast hole scanning, spotters with radiation scanners, and truck scanning to categorise ore and waste. LHM used the dispatch system to direct and monitor truck movements.

Ore was hauled to the ROM pad adjacent to the primary crushers. The majority of ore was tipped onto the ROM pad stockpile for reclaim by a front-end-loader.

Waste was used for haul road construction and tailings dam construction as needed or hauled to waste dumps. The road network currently in place is well developed however continued road maintenance as well as additional roads will be required throughout the life of the mine.

The following plan shows the mine layout. The pits on the east side are shallow and only ~10-15m deep, whilst the western side pit is approximately 100m deep. The channel dips at approximately 10° from east to west.

B.3.2.1. Mining Equipment

Mining equipment was owned by the contractor and all equipment demobilised.

B.3.2.2. Mining Production

Based on pit optimization results, multiple pits were mined concurrently to ensure correct blending for grade and lithology, to reduce the size of the stockpiles at the RoM pad and allow a smooth production profile for both mining and processing.

Mining activities were both to the west and east of the Process Plant. During the reporting period, mining was undertaken from the following areas: Pits C, E, F, G and H. The location of these pits are shown on Figure 3. Mining operations were suspended in October 2016.

B.3.3. Processing Operations

The current Processing Plant lay-out is presented below (Figure 4), whilst a block-flow diagram below (Figure 5) present the processes in the plant.

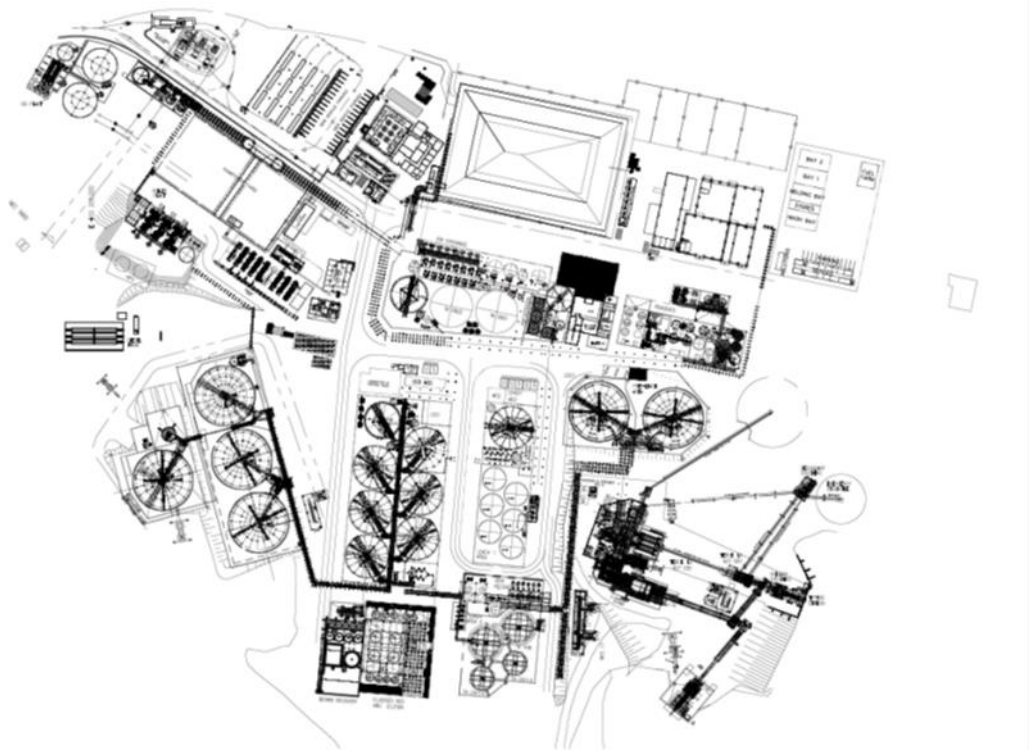


Figure 4: Processing Plant Lay-out

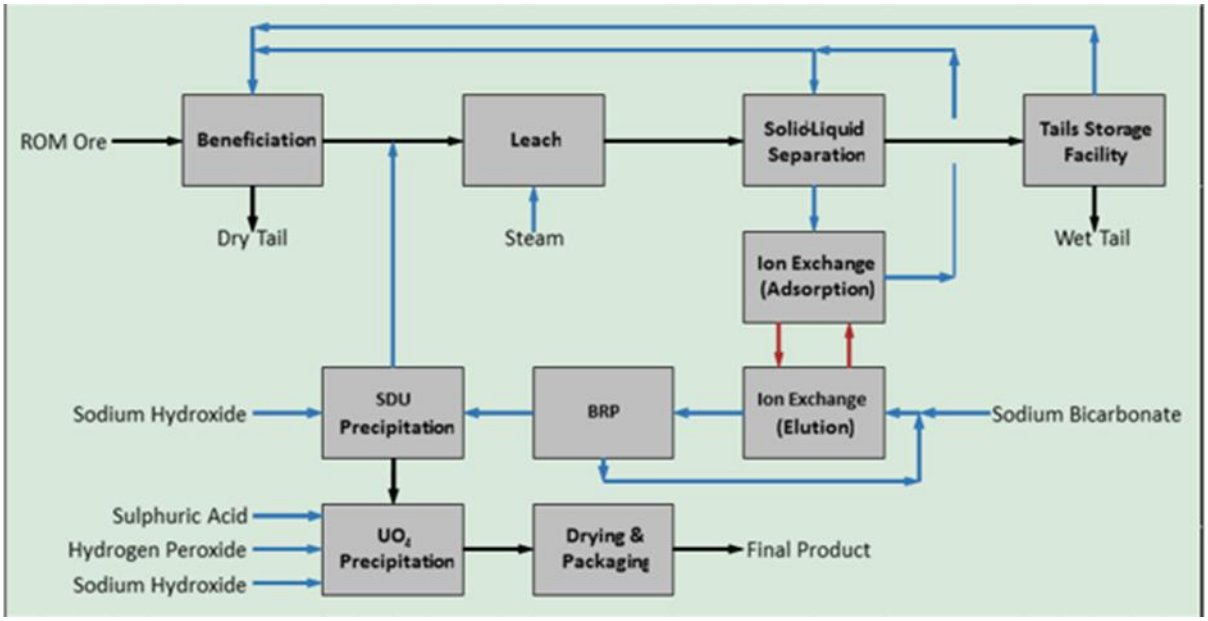


Figure 5: Block Flow Diagram the processes in the processing plant

B.3.3.1. Crushing, Scrubbing and Classification

Summary

All ore from the pits was delivered to blending stockpiles at the RoM pad adjacent to the process plant. The ore is blend into a crusher from at least five stockpiles determined by source, grade, fragmentation or moisture content. Top size of the ore is between 750mm and 1000mm and the feed to the plant is blended to around 750ppm U_3O_8 (equivalent). At the RoM the ore undergoes crushing, scrubbing and classification produce a barren stream 80ppm which is rejected as waste, and a high-grade stream to 1029ppm which is thickened and fed to the extraction area. Approximately 40% of the feed is rejected as coarse or barren sands, and the remaining 60% uranium bearing material enters the leaching process.

Detail description

Crushing and Screening:

Ore grade material on the ROM pad is fed through two ROM bins with vibrating grizzly feeders and crushed in two crushers to minus 80 – 110mm (depending on the ore type being processed). One bin feeds the Stage 1 & 2 circuit, and the other Stage 3.

Crushed material is conveyed to three scrubbers which break down the calcrete that holds the agglomerates together, liberating the uranium as well as removing the uranium bearing coating from the quartz pebbles.

After scrubbing, screened oversize, plus 10mm, is discharged to a recycle crushing circuit where it undergoes another screening process at 45mm, splitting the material into a plus 45mm fraction deporting to the secondary crusher and a minus 45mm portion which is fed to the tertiary crusher.

The minus 10mm crushed ore from the secondary crusher and the minus 8mm product from the tertiary crusher combine and are fed over a 10mm vibrating screen.

The minus 10mm ore is transferred onto the scrubber feed conveyor while the plus 10mm is conveyed back to the tertiary crusher for re-crushing.

There is one primary crusher and two scrubbers in Stages 1 and 2 and there is an additional crusher and scrubber for Stage 3. The Stage 3 scrubber is gear-driven rather than, as for the older units, tyre-driven.

The recycle (secondary and tertiary crushing) circuit, consisting of one cone crusher for each duty, have been augmented by a second tertiary crusher.

The Stage 3 section was designed to handle 270tph of fresh feed while the Stages 1 and 2 equipment was designed for 200tph combined. Currently it is possible to handle up to 550tph with both circuits and 300tph with the Stages 1 and 2 equipment.

Cyclones and Screening:

Minus 10mm screened undersize from the scrubbers is pumped to the Primary cyclones. The Primary cyclone overflows are transferred to linear screens that operate as a last safety screen before being pumped to the pre-leach thickener. The primary cyclone underflow is fed to a double deck primary screen with 3mm and 2mm screens. The +2mm material is discharged to the barren stockpile. The -2mm slurry is fed to a Secondary cyclone cluster or a hydro-classifier (Hydrosort). The Secondary cyclone/Hydrosort overflow is also fed to the linear screens before being fed to the pre-leach thickener. The Secondary cyclone/Hydrosort underflow is screened with 500 micron secondary screens. The oversize is discharged onto the barren stockpile and the overflow joins the feed to the linear screens. Additional cyclone and screen capacity was added for Stage 3.

B.3.3.2. Leaching

Summary

Uranium is extracted using elevated temperature alkaline leaching technology. Both sodium carbonate (Na_2CO_3) and sodium bicarbonate ($NaHCO_3$) are added as major leach reagents. Leaching is carried out at 90°C to 95°C, achieved by heat recovery from hot leached slurry discharge and the addition of direct steam injection. Steam is generated using three Heavy Fuel Oil (HFO) fired boilers.

Detail description

The minus 500 micron slurry material is pumped to one of two pre-leach thickeners where it is thickened to an underflow density up to 50% solids by mass with the assistance of flocculent. Thickener overflow is recycled back to the scrubbing process.

The thickener underflow is pumped to separate conditioning tanks where process water is added to adjust the slurry relative density to meet optimal leach conditions. The slurry fed to Leach train 1 (around 30% of the leach feed quantity) is then pumped through a set of spiral heat exchangers and a pilot flash splash heat exchanger where it is pre-heated to 70ºC by hot slurry leaving the leach circuit. The slurry fed to Leach train 2 (around 70% of the leach feed quantity) is pumped through a single flash splash heat exchanger where it is also pre-heated to 70ºC by hot slurry leaving the leach circuit. It is then further heated through direct steam injection into leach vessels 1 & 2 and 7 & 8 to a temperature >90ºC. The slurry is leached in both the leach trains of which Leach train 1 consists out of 6 cascading concrete tanks (Stage 1 – 1,800m^3 volume each) and Leach train 2 that consists out of 2 concrete (Stage 2 – 3,600m^3 volume each) and 2 steel tanks (Stage 3 – 1,800m^3 volume each) also operating in cascade.

All leach tanks are fitted with agitators to ensure optimal slurry mixing. The sodium carbonate and sodium bicarbonate levels in both Leach trains are continuously monitored and added if required to maintain the target of pH 10.4. After 27 to 32 hours, the leached slurry exits the leach tanks and is pumped through either the spiral heat exchangers or the flash splash units to pre-heat the fresh leach feed slurry.

The "flash splash" technology, operating under a vacuum, recovers heat from the leach discharge circuit. Plant steam is used in a stream ejector to generate the vacuum, jointly or alternatively to a vacuum pump. Construction of a new "flash splash" installation to replace the spiral circuits and the pilot flash was completed in 2016. The steam is produced from three HFO boilers. The HFO boilers are well run. Both Leach trains utilises direct steam injection for heat top-up.

B.3.3.3. Counter Current Decantation (CCD)

Summary

After leaching the uranium in solution is separated from the solids (45ppm) using a conventional seven-stage counter current decantation (CCD) circuit. Fresh water and recycled barren (55ppm) from both Ion Exchange (IX) circuits and TSF are used as washing liquor for the CCD circuit. Washed solids are diluted and pumped to the Tailings Storage Facilities (TSF) for final disposal. Pregnant Leach Solution (PLS) feeds the fixed-bed and fluidised bed IX circuits and is first clarified prior to being pumped to the concentration and purification circuits.

Detail description

The CCD circuit was modified to accommodate a seven stage wash circuit for the increase in tonnage. Stage 1 and 2 had nine CCD thickeners, another two were added for Stage 3.

Leached slurry enters CCD1 from which the underflow feeds three parallel rows of two thickeners which then feed into another four thickeners in series to give seven stages. Flocculent is dosed to each thickener to assist with solids settling.

Barren water from Ion Exchange and industrial water (untreated NamWater) are used as wash water in the CCD circuit.

In the final CCD stage, underflow is transferred to the tailings sump before being pumped to the TSF. Each CCD thickener allows for extensive internal dilution to take place.

Clarifier overflow is collected in pregnant solution transfer sumps and pumped to the existing pregnant solution holding tank.

B.3.3.4. Ion Exchange (IX)

Summary

Conventional down-flow fixed-bed IX technology is operated in parallel with fluidised-bed IX technology which is used to concentrate and purify the PLS received from the CCD circuit. The fixed-bed IX circuit operates with pods in a lead-lag-elution mode while the fluidised bed IX circuit utilises separate columns for adsorption and elution. Elution is carried out using 1 molar sodium bicarbonate. A split elution technique for the fixed-bed elution is practised whereby part of the eluate from a preceding elution is used as eluant for the next one. Concentrated eluate from both IX circuits is fed to the precipitation area

Detail description

Stages 1 and 2 fixed bed IX system recovers uranium from the CCD pregnant solution. Twenty four extraction columns are available to adsorb the uranium from solution onto a weak base resin. Once the resin is fully loaded, it is eluted with sodium bicarbonate to strip the resin of uranium into a high grade pregnant solution (concentrated eluate). Thereafter the columns are put back into an adsorption stage and the process repeats itself.

The Stage 3 IX circuit comprises four NIMCIX fluidised bed reactors arranged two for adsorption and two for elution. Initial operation was without the use of trays but these have now been installed in the elution columns; they were part of the original design. This new section was intended to take the bulk of the PLS flow (90% of current flow) and provide flexibility and capacity between the two streams. In practice, some fixed bed IX (16 of 24 columns) and both of the two NIMCIX trains are used. The NIMCIX reactors operate in semi-continuous mode. These units operate at lower eluate levels than the fixed bed units.

B.3.3.5. Bicarbonate Recovery Project (BRP)

During 2015, the BRP plant was commissioned. This is an innovative technology, which sits between the IX elution and Precipitation process steps. This technology has enabled LHM to lower the operating costs by nearly 20%.

Sodium bicarbonate is used to elute the uranium from the IX resin. This process consumes ~30% of bicarbonate. The remaining 70% of bicarbonate is neutralised by adding caustic soda prior to the uranium precipitation process.

The process is through a membrane to separate the majority of the bicarbonate, this process is similar to a reverse osmosis plant. By recovering bicarbonate, the fresh consumption is reduced by 68%. In addition, the caustic soda consumption reduced by 53%, as not as much is required anymore to neutralise the bicarbonate. Uranium recovery has increased by 2% due to the positive impact on site carbonate and the water balances.

B.3.3.6. Precipitation

Summary

LHU operates a two-stage precipitation circuit. Firstly, sodium diuranate ($Na_2U_2O_7$) also refer to as SDU is precipitated from the IX concentrated eluate using sodium hydroxide (NaOH). This precipitate is thickened and washed to remove deleterious soluble salts before the second precipitation in which the SDU is re-dissolved using sulphuric acid (H_2SO_4) followed by precipitation using hydrogen peroxide (H_2O_2) as the precipitant and NaOH as a pH modifier to produce hydrated uranyl peroxide ($UO_4{:}2H_2O$). Following precipitation, the hydrated uranyl peroxide slurry is centrifuged to remove excess moisture prior to being dried and packed into drums for export. The final product is UO_4, which is an orange-yellow powder.

Detail description

The concentrated eluate from the ion exchange/elution circuit flows to a uranium precipitation holding tank where the pH of the solution is increased to over 12.8 through the addition of sodium hydroxide. This precipitates the uranium as sodium diuranate (SDU) which is collected in a thickener to increase the underflow density.

It is then pumped to a wash tank to remove high levels of sodium hydroxide and then pumped to a batch precipitation tank where it is re-dissolved in sulphuric acid at a pH of 3.6. Once all SDU is dissolved, hydrogen peroxide is added at a controlled rate, together with sodium hydroxide which causes the uranium to precipitate as UO. The use of hydrogen peroxide in the re-precipitation stage also reduces the vanadium content of the precipitate to a level which is necessary for all converters.

An additional two SDU mixing tanks and associated pumps installed in Stage 3 provide capacity to handle the increased volume of concentrated eluate.

This is a batch process. Following centrifuging (three units, one operational and two standby), the solids are fed to an oil heated dryer using an enclosed screw feeder. Drying takes place at about 300ºC for one hour to drive off free and crystalline water. The dry powder (final uranium oxide product Uranium Ore Concentrate (UO3) is then packaged in drums, weighed and sealed in preparation for transportation.

A new dryer unit was installed in mid-2016.

The process plant is designed to maximise the recovery and recycle of process liquor so that the requirement for fresh water is minimised. However, some areas within the process are sensitive to water quality and process water cannot be used. To accommodate this quality requirement, water from NamWater is pre-treated in an ultra-filtration Reverse Osmosis (RO) plant. The product from this water treatment plant is used in the process as required, while the brine is used for dust suppression on the roads. Not all the water demanded by the process plant is processed through the RO plant.

Separation of clean and dirty water is maintained on site, wherever practical, through the use of a network of diversion channels and trenches. Where possible, clean water is diverted around site whilst rainfall runoff within the site is managed using a series of sumps, drains, tanks and ponds. Water used in the process plant is separated from other water and is not released.

Make-up and distribution systems are provided for the following reagents used in the metallurgical process:

- Sodium carbonate used in the leach process;
- Sodium bicarbonate used in both the leach and IX processes;
- Flocculent that is required to settle solids in the thickening and CCD circuits;
- Sodium hydroxide required for SDU precipitation and as a pH modifier during uranium precipitation;
- Sulphuric acid that is required to dissolve the SDU precipitate prior to uranium precipitation;
- Hydrogen peroxide required for uranium precipitation;
- Resin used in the fixed bed and fluidised bed IX circuits; and
- Heavy fuel oil for the steam boilers.

B.3.3.7. Historical Production

Construction at the Langer Heinrich project commenced in September 2005 and staged commissioning of the plant began in August 2006. Mining commenced in 2007 with a proposed 25 year life (2030). The operation was officially opened on 14 March 2007. The first commercial product shipment occurred in the same month.

Stage 1 nameplate capacity of 2.6Mlb/a U_3O_8 was achieved in 2009. Stage 2 construction commenced in 2008 with the aim of increasing production capacity to 3.7Mlb/a U_3O_8, this was achieved during 2012. Stage 3 expansion construction work was completed in 2012 with the aim of increasing the production capacity to 5.2Mlb/a U_3O_8, this production was achieved during 2013. Cumulative production for the period 1 July 2008 to 31 December 2018 was reported as 43Mlb.

LHU's Board of Directors resolved in April 2018 to put Langer Heinrich Uranium Mine (LHM) on care and maintenance status due to the continued low uranium price. The mining

operations were curtailed in 2016 and the main production activities ceased on 13 May 2018. The operation successfully transitioned to care and maintenance status in August 2018. A formal Care & Maintenance Plan was implemented with a key focus to preserve the mine and equipment as an asset and ensure safe, environmentally responsible and secure activities taking place on site, whilst meeting relevant regulatory and other requirements. Further information on Uranium Ore Concentrate (UoC) production is provided below (Figure 6).

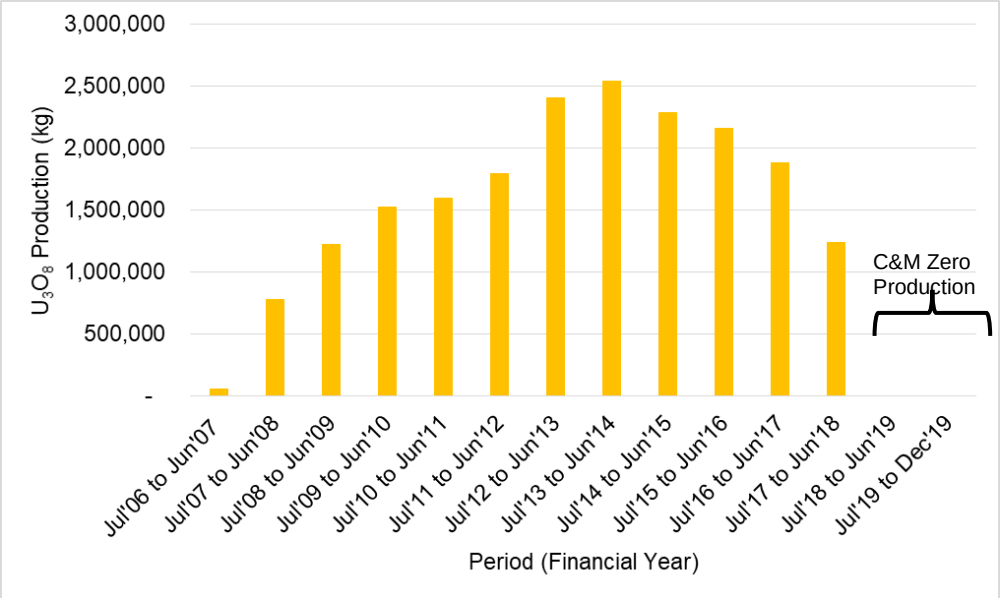


Figure 6: Uranium Ore Concentrate Production between 1 July 2006 and 31 December 2019.

B.3.4. Tailings Storage Facilities (TSF)

Tailings from the process plant is pumped into a Tailings Storage Facility.

It is a requirement of the current EIA for Langer Heinrich that tailings be stored below ground Surface water and Ground within mined out pits. For initial tailings disposal until a disused mining pit was available, permission was obtained for the provision of a temporary tailings storage facility, TSF #1, which is located on the edge of the Gawib river flood plain immediately upstream of the process plant and the first pit, Pit A.

After the mining in Pit A was been completed this pit was retained as the second control structure for the storage of floodwater coming down the Gawib River (first control structure is Pit F) and as such it isolates the process plant and mining downstream from Pit A from flood disruption. Pit A is now the location of the new tailings disposal facility (TSF #5).

The first operating facility was the temporary Tailings Storage Facility 1 (TSF #1). TSF #1 is an above ground, earth embankment construction. TSF #1 was extended because mining on Pit D (now TSF #2) did not generate expected ore, hence completion of mining of Pit D and hence the construction of TSF #2 was delayed, and therefore TSF #1 had to be extended.

Notwithstanding the additional capacity provided by the raise and extension of TSF #1, an additional Tailings Storage Facility (TSF #2) was required prior to tailings deposition commencing in Pit B, which is TSF #3. TSF #2 is an in pit facility.

TSF #3 was used for tailings disposal from October 2013. Use of TSF #3 finished in July 2017 at which time construction of a new in pit facility TSF #5 had been completed in Pit A.

Eventually, TSF #4 will be constructed in Pit C.

The locations of the different Tailings Storage Facilities (TSF #1, TSF #2, TSF #3 and TSF #5) is presented below (Figure 7).

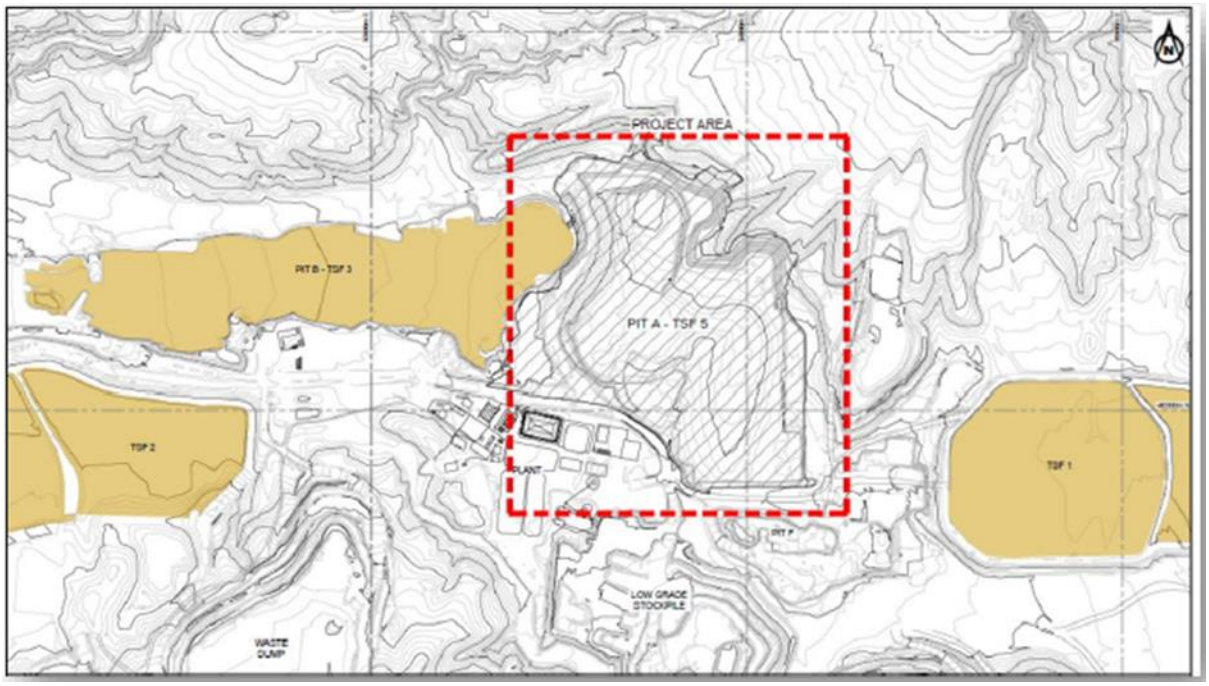


Figure 7: Location of Tailings Storage Facilities

B.3.4.1. Tailings Storage Facility # 1 (TSF #1) and TSF #1 Extension (TSF #1 Ext)

TSF #1 is located to the east of Pit A. The final area of the facility is about 304,200m^2 with a total storage capacity of 2.1Mm^3. TSF #1 is considered a temporary facility as it has been constructed over a proposed future pit; hence all tailings material will be removed and stored within the excavated pits. TSF #1 material will be moved into another in pit TSF to provide access to the mineralised area underneath.

TSF #1 reached full capacity in the last quarter of 2010. Tailings were deposited into TSF #1 Extension after this time.

The embankment elevations were constructed to RL661m. The final area of the facility was is nearly 261,650m^2 with a final estimated storage capacity of 1.2Mm^3.

Because of the problems with the low density of slurry being fed to TSF #2, a new internal wall was built in TSF X1 extension to allow additional deposition.

The facilities were designed by Metago (now SLR Consulting), an Australian consultancy. The TSF was designed to accommodate a 1:100 year return period 24-hour storm event. Freeboard was a minimum of 1m. The construction was above ground compacted mine waste faced with crushed and compacted calcrete.

The tailings was pumped from the process plant to the TSF as a slurry. A managed tailings deposition procedure was operated using sub-aerial deposition.

Tailing deposition into TSF #1 Extension ceased in March 2012.

<u>Volume (m^3) of Tailings Slurry Discharged into TSF #1 and TSF #1 Ext</u>

The volume (m^3) of Tailings slurry discharged into (TSF' # 1 and TSF #1 Ext) between January 2007 and March 2012 presented below (Figure 8):

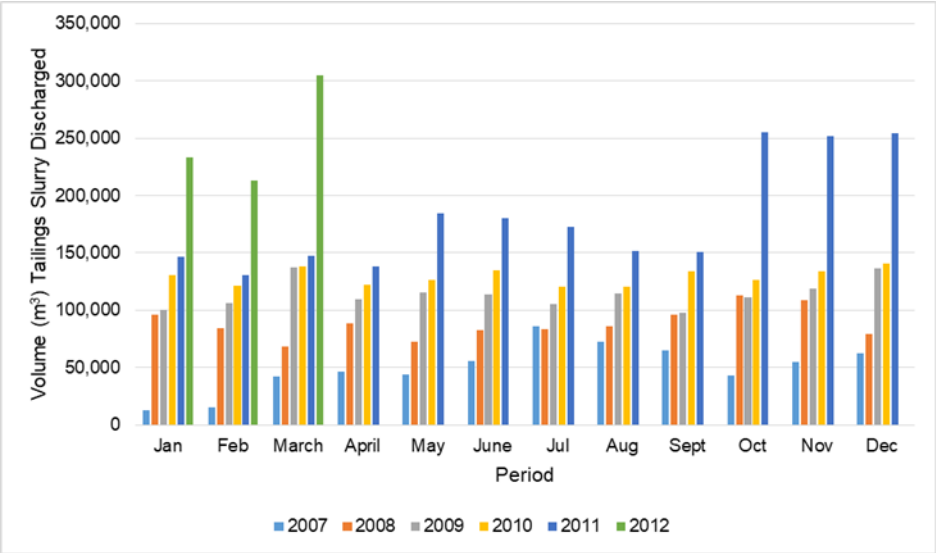


Figure 8: Tailings slurry (m^3) discharged into TSF #1 and TSF #1 extension between Jan 2007 and Dec 2012.

B.3.4.2. Tailings Storage Facility # 2 (TSF #2)

Metago, now SLR Consulting Environmental Engineers, carried out the design of the TSF #2. The TSF #2 Phase 1 confining embankment was within the footprint of a portion of Pit D. Deposition of tailings within the TSF #2 Phase 1 area began in August 2011.

TSF #2 embankment construction was carried out by KMCC whilst the HDPE lining work at TSF #2 was done by Engineered Linings (Pty) Ltd.

TSF #2 is located to the west of the process plant adjacent to the south of the mine access road. On the western side, the TSF is bordered by the Reid Wash and on the southern side by F-dump. The northern sections of TSF #2 are constructed within parts of the mined out Pit D.

The TSF was split into two phases, Phase 1 and Phase 2, which were completed in 2013. The total design storage capacities of the two phases was 4,451,000m^3 which was design storage capacity for three years of Stage 3 production.

The TSF #2 embankments were constructed using two material types that were produced as waste by the mining operation:

- Variably cemented calcretes that make up the overburden. These materials are used for bulk earthworks in the embankments.
- Calcareous paleochannel materials comprising conglomerates are usually fine grained. These materials are also suitable for embankment construction but have a further benefit in that they can be used as low permeability zones. They are also utilised in construction of compacted earth fill liners.

The northern boundary of the TSF #2 was formed by a confining embankment approximately 30m high and constructed in the lower reaches of the pit immediately adjacent to the paleochannel underlying the Gawib River. The confining embankment also extended along the western perimeter of TSF #2 on the boundary of the Reid Wash. A divider embankment was constructed between Phases 1 and 2 due to the fact that mining operations were still underway in the eastern part of Pit D when construction started on TSF #2 Phase 1 during May 2010.

Side slopes of a maximum of 1:2.5 were constructed in order to ensure slope stability of the embankments.

The final elevation of the northern confining embankment was RL621 which allowed a five metre total freeboard at the end of deposition. This elevation was the same for both Phases 1 and 2. The western and divider embankments sloped uphill to the south from RL621 to RL625 and RL627 respectively in order to maximise capacity on the beached tailings.

The design freeboard of 5m was determined to be sufficient to contain the 1:100 year recurrence interval storm and to contain any tailings that may creep down towards the embankment as a result of blasting activity during mining of the paleo-channel.

The pit area within TSF #2 was lined using a 1.5mm HDPE geo-membrane liner. Tailings distribution to TSF #2 has finished and the tailings facility is being progressively capped.

Volume (m^3) of Tailings Slurry Discharged into TSF #2

The volume (m^3) of Tailings slurry discharged into TSF # 2 between April 2012 and September 2013 presented below (Figure 9).

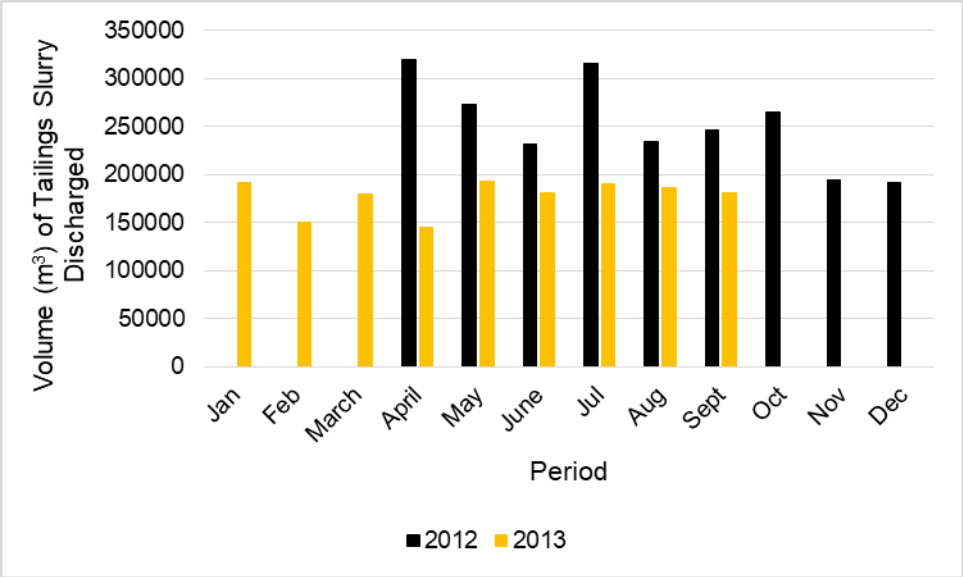


Figure 9: Tailings slurry (m^3) discharged into TSF #2 April 2012 and September 2013.

B.3.4.3. Tailings Facility #3 (TSF #3)

In-pit tailings deposition began into TSF #3 early in October 2013. TSF #3 has been constructed in the completed Pit B. The ore body follows an ancient river bed which has resulted in a long, sloping pit shell. Pit B meets Pit C at the western edge of Pit B via a narrow excavation. A fill embankment, termed the Cut-Off Wall, has been constructed in this narrow section to form the downstream barrier required to isolate tailings storage within Pit B. Pit C will also store tailings forming TSF #4 upon completion of mining and the required construction activities. Pits A and B are separated by a remaining in situ wall, termed the Bridge Wall. This forms the up-stream barrier wall for TSF #3.

Two aquifer systems are present in the mining areas. Mining from Pit B required the excavation of a portion of the shallow Gawib and the deeper paleo-channel aquifer systems. As part of the construction of the in-pit TSF #3, the deeper of these aquifers have been partially reconstructed to allow for the re-establishment of hydraulic continuity through the mining lease. This paleo-channel reinstatement by backfill of the mining void of Pit B with permeable waste rock material has been completed.

The following minimum objectives were used to design TSF #3:

- Maximise the storage capacity within TSF #3 whilst allowing for mine closure provisions.
- Reduce the volume of supernatant water produced.
- Reduce seepage of supernatant water into the surrounding natural environment.
- Minimise risk of contamination of the Ground Water.
- Reinstating hydraulic continuity of the paleo-channel aquifer.

The original embankment was constructed to a height of 21m, with a slope of 1V:3H. The calculated static Factor of Safety (FOS) was 1.7, and the pseudo static FOS was 1.6.

Typically the underdrainage and liner for this TSF comprised:

- In-situ rock.
- In-fill of paleo-channel with permeable material to act as underdrainage.
- The design provided for a confinement layer of compact low permeable material (clay), 1m thickness. When suitable was not available, an HDPE liner was installed.
- Drainage layer of barren sands from the process plant (1-1.5m thick).
- HDPE liner in the three sump areas.

TSF #3 was designed by SRK and the construction was done by KMCC under the control and responsibility of SLR. TSF #3 was in use from October 2013 until June 2017 and is no longer in use.

Volume (m^3) of Tailings Slurry Discharged into TSF #3

The volume (m^3) of Tailings slurry discharged into TSF # 3 between October 2013 and June 2017 presented below (Figure 10):

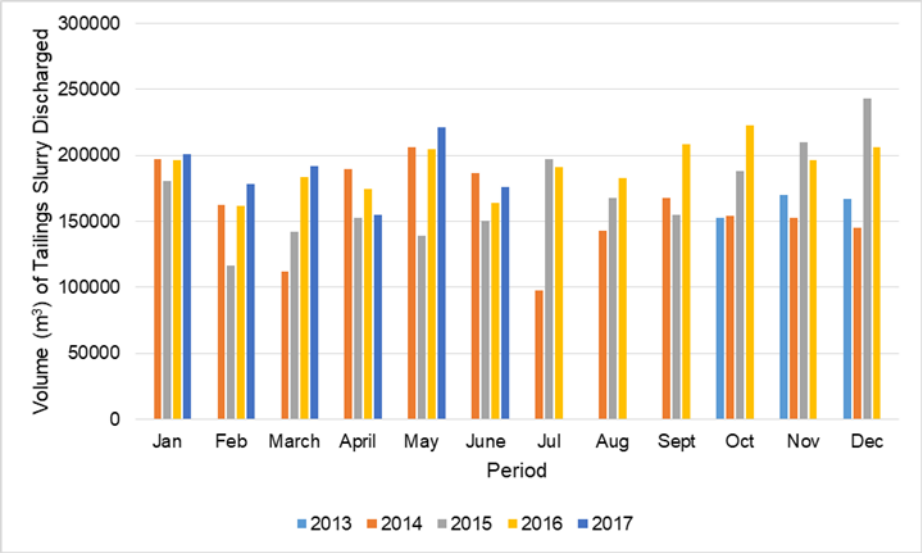


Figure 10: Tailings slurry (m^3) discharged into TSF #3 between October 2013 and June 2017.

B.3.4.4. Tailings Storage Facility #5 (TSF #5)

TSF #5 is located in the completed open cut Pit A. The ore body follows an ancient riverbed (paleochannel) which has resulted in a long, sloping pit shell. Pit A meets Pit B (TSF #3) at the western edge of Pit A at what has been termed the Bridge Wall. This is an existing unmined section across the pit, which provides upstream containment for TSF #3. A single downstream (western) embankment is required to maximise storage within Pit A. The western embankment is constructed partially on the existing (unmined) in situ wall. Pit A has a significant insitu high wall on its northern side.

Two aquifer systems are present in the mining areas. Mining from Pit A required the excavation of a portion of the shallow surficial Gawib alluvial aquifer and the deeper paleochannel aquifer systems. During mining, Groundwater gradients are towards open pits, preventing flows from the TSF entering the two aquifer systems. As part of the construction of the in-pit TSF #5, the paleochannel aquifer has been partially reconstructed, where required, to allow for the re-establishment of hydraulic continuity through the mining lease.

Paleochannel reinstatement by backfill of the mining void was completed within Pit A. The minimum requirement of 10m thickness for the paleochannel has been reinstated, ensuring hydraulic continuity of the paleochannel across the project site.

TSF #5 was designed by SRK, with the design objectives being:

- Maximise the storage capacity in TSF #5 while allowing for mine closure provisions.
- Reduce the volume of ponded supernatant water.
- Reduce seepage of supernatant water into the surrounding natural environment.
- Minimise risk of contamination of the Ground Water.
- Reinstate hydraulic continuity of the paleochannel aquifer.
- Ensure compliance with environmental Standards, ANCOLD guidelines, International Atomic Energy Agency and Paladin's internal Standards and Sustainability guidelines.

The seismic loading on the embankment was considered for the seismogenic sources of an earthquake and local blasting. The maximum peak ground acceleration (PGA) due to an earthquake on site has been assessed as 0.4m/s^2 – i.e. approximately 0.04g according to United States Geological Survey (USGS).

The design is assessed for an operating base earthquake (OBE) with consideration given to the effects of a maximum credible earthquake (MCE).

The containment concept for the in-pit TSF #5 is to utilise the physical containment provided by Pit A. Placement of the TSF within the pit also ensures that the TSF will remain on previously disturbed areas. A downstream fill embankment will increase the storage capacity of the pit and provide a suitable Surface water and Ground for the placement of the HDPE liner.

The supernatant water recovery and tailings consolidation is maximised through the installation of a decant pier and an underdrainage system (including a drainage pipe network). The drainage and decant system has a similar intent to that implemented in TSF #3; however, the water recovery system is considered more robust with the addition of a large decant pier and two vertical decant risers. A single sump with two decant structures has been installed in TSF 5.

Deposition is achieved from set deposition points around a portion of the facility perimeter. An underdrainage system, including a pipe network, conveys tailings consolidation water to a collection sump located in the north of the facility near the toe of the western embankment. A decant pier formed primarily of drainage sand, two steel decant risers and perforated high density polyethylene (HDPE) pipes collects supernatant water and also provides access for submersible pumps to withdraw water from the collection sump.

The tailings and tailings water are to be contained within the pit(s) even in the case of a TSF overflow.

The TSF #5 western embankment is adjacent to TSF #3, and an emergency spillway is used to direct any emergency overflow from TSF #5 into TSF #3.

The TSF #5 emergency spillway is formed with five pipes, placed within the western embankment at RL 622.5m, discharging onto a coarse rip-rap energy dissipater channel and then into TSF #3. Five x DN500 HDPE pipes form the spillway.

The 24-hour PMP for LHM is 234mm. The 24-hour PMP can be stored above the maximum operating pond elevation of RL 621.5m, assuming no external catchment, and assuming that the modelled tailings beach profile and levels are correct.

Given the PMP can potentially be stored within the TSF, the spillway is considered an additional safeguard due to the high variability and uncertainty of operations.

At the rate of fill recorded to the end of February 2018, the projected fill date for the TSF was 9th May 2019. Therefore, there is approximately one year capacity remaining in TSF5.

Volume (m^3) of Tailings Slurry Discharged into TSF#5

The volume (m^3) of Tailings slurry discharged into (TSF #5) between July 2017 and May 2018 presented below (Figure 11):

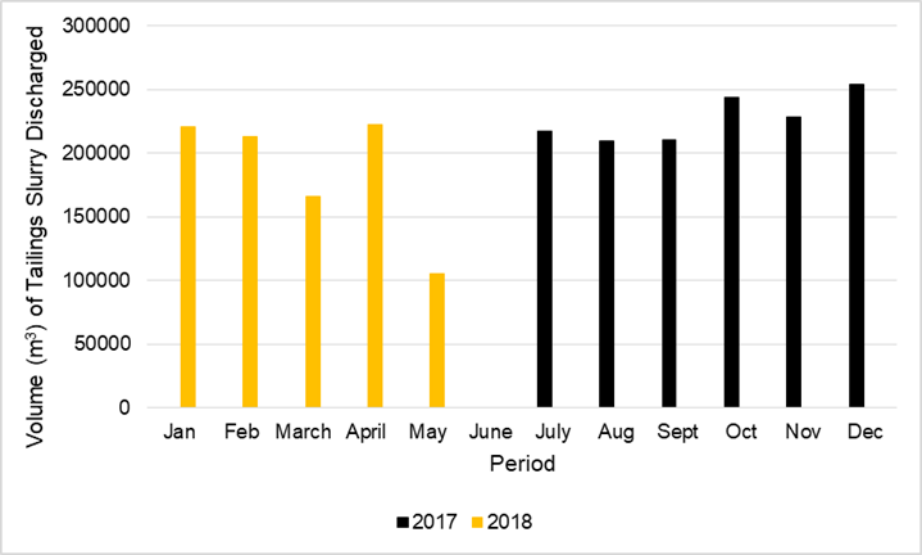


Figure 11: Tailings slurry (m^3) discharged into TSF #5 between July 2017 and May 2018.

B.4. CARE AND MAINTENANCE ACTIVITIES

The LHU Board of Directors resolved in April 2018 to put Langer Heinrich Uranium Mine (LHM) on care and maintenance status due to the continued low uranium price. The mining operations were curtailed in 2016 and the main production activities ceased on 13 May 2018. The operation successfully transitioned to care and maintenance status in August 2018.

A formal Care & Maintenance Plan was implemented with a key focus to preserve the mine and equipment as an asset and ensure safe, environmentally responsible and secure activities taking place on site, whilst meeting relevant regulatory and other requirements.

Paladin Energy Ltd being the majority shareholder of Langer Heinrich mine commenced with a Prefeasibility Restart Study (PFS) in April 2019 to define and assess the potential for a restart of the LHM operations. The Chief Inspector (MME) was informed of the studies and activities associated with the study work.

The formal Care & Maintenance Plan was implemented with a key focus to preserve the mine and equipment as an asset and ensure safe, environmentally responsible and secure activities taking place within full compliance.

B.4.1. Maintaining the plant and equipment in a state of readiness to facilitate a restart of operations.

B.4.1.1. Maintenance and servicing of equipment:

Routine maintenance and servicing to preserve the condition of non-operable plant equipment and infrastructure is ongoing as per the C&M maintenance framework. This included amongst others; "bump starting" of identified equipment, rotation of bearing barrels, turning of gearboxes.

Routine maintenance and servicing of essential services equipment that are still operable throughout C&M is ongoing as per the C&M maintenance framework. This equipment include for example; LHM water supply systems, fire protection systems, energy supply systems, road infrastructure, vehicles, security surveillance systems, IT-infrastructure and maintenance of office and workshops.

B.4.1.2. Inspections:

Routine inspections as per the Maintenance and Engineering risk register were conducted to verify and enforce the safe execution of work. Structural integrity inspections were conducted pertaining to for example; walkway gratings, handrails and Tailings Storage Facilities. Deviations are currently being corrected and tracked via LHU's maintenance management system.

B.4.2. Managing and maintaining all water and Tailings Storage Facilities (TSF's).

Processed material that could not be processed further either because of constraints related to current metallurgical technology or due to the current commodity price or as a combination is referred to as "tailings material". Tailings material consist of a mixture of tailings solution (m3) and tailings slurry (tons). The tailings material (slurry) is disposed into lined Tailings Storage Facilities (TSF's). The locations of the various TSF's are indicated as per Figure 1-3. During this reporting period no new TSF's were constructed, nor were Tailings material discharged. However, the TSF #5 return water system was modified to recycle the supernatant pool through the discharge points at the facility in order to assist in the evaporation of the water over time.

Further information on monitoring and management of water and TSF's is provided in the Environmental Management Plan Performance 01 July 2017 to 30 June 2020 under the following sections:

- Biodiversity MMP.
- Surface Water/ Storm Water MMP.
- Groundwater MMP.
- Resource Usage MMP.
- Waste MMP.

At the time of submission of this EMP report the Langer Heinrich Uranium mine is still in Care and Maintenance Phase.

B.5. PREFEASIBILITY RESTART STUDY (PFS)

The aim of the Paladin Energy Ltd originated Prefeasibility Restart Study (PFS) is to define and assess the potential for a restart of the LHM operations. The PFS commenced on site and includes targeted exploration drilling work, focused surveying, considering resource definition, limited processing testing work as well as consideration of license to operate

obligations. Any restart decision is linked to the uranium price which is currently still contracted.

B.5.1. Drilling activities and performance

Drilling occurred on ML140 and was conducted to define the exact shape and geographic location of the potential Uranium and Vanadium resources in the ground. This work was undertaken in previously disturbed areas and no new land was disturbed during this drilling. The drilling included Diamond Core (DC) drilling and Reverse Circulation (RC) drilling. The DC drilling was done to sample some of the tailings rock flower and the RC drilling was done to sample the remainder of native material.

The targeted resource definition drilling work was completed by the Namibian owned drilling companies Stewardship Drilling who employ Namibian employees. Drilling occurred between July 1 2019 and 25th July 2019 for a total of 5,079m (DC ≈ 162m and RC ≈ 4,917m).

B.6. ENVIRONMENTAL PERFORMANCE FEEDBACK FOR THE PERIOD JANUARY 2017 TO JULY 2020.

B.6.1. Executive Summary

The information provide in this Section provides feedback on progress against commitments made in the Environmental Management Plan (EMP) for the reporting period; 01 July 2017 – 30 June 2020.

Fifteen (15) management and mitigations programs were identified to drive the EMP implementation for Langer Heinrich Mine (LHM). These 15 Environmental management and mitigation programs (EMMP's) have been developed and implemented in accordance with the International Organisation of Standardisation (ISO) 14001 / South African National Standard (SANS) 14001: 2005 environmental management system requirements, which is based on a process of continual improvement. Below follows a summary on the progress against EMMP commitments:

Table 10: Summary feedback on Environmental Performance for the period July 2017 to June 2020

Management and Mitigation Program	Potential significant impacts / issues of concern	Management objectives and commitment	Status
Air Quality	Dust and particulate matter.	Prevent unacceptable air quality related pollution impacts to Bloedkoppie and the on-site temporary driller's camp.	Implemented
	Gaseous emissions	Achieve compliance to the adopted best practice standard	Implemented
Biodiversity	Loss or degradation of fauna and flora	Prevent or limit the unacceptable loss of biodiversity and related functionality, a reduction in key ecological drivers of groundwater and temporary surface water flow.	Implemented
	Loss or degradation of plant and animal habitats	Achieve compliance to abstraction permit	Implemented
	Separation of upstream and downstream systems		
	Destruction of hydrology		
	Decrease in the water table		
	Over abstraction of the groundwater		
Surface Water	Alteration of drainage patterns	Prevent degradation of surface water quality, alternation of drainage patters and in the event of a flood manage storm water.	Implemented
	Contamination of surface water run-off	Achieve compliance to Waste water and effluent disposal exemption permit.	Implemented
Ground Water	Loss of Groundwater to Swakop River farmers and vegetation (dewatering)	Minimise the environmental impact on groundwater quality and quantity as a result of LHU mine activities and products use that the surrounding ecosystem functions are within baseline ranges.	Implemented
		Achieve compliance to abstraction permit	
	Contamination of Groundwater water	Achieve compliance to Waste water and effluent disposal exemption permit.	Implemented
Resource use	Depleting resources (Water, manufactured material, Hydrocarbons, Electricity)	Monitor the consumption of resources and find ways to minimize consumption, optimise usage and ensure efficient use of resources.	Implemented
	Accidental resource (Hydrocarbons, water, manufactured material) release may result in contamination.	Adhere to Park Permit conditions	Implemented
Waste	Pollution of land, soil, ground and surface water	Ensure proper storage, removal, transportation, monitoring and disposal of non-mineralised waste	Implemented
	Depletion of resources	Achieve compliance to Waste water and effluent disposal exemption permit	Implemented
	Nuisance	Adhere to Park Permit conditions	Implemented
	Visual impacts	Ensure proper design, stockpiling, handling and monitoring of mineralised waste to prevent pollution.	Implemented
		Achieve compliance to Waste water and effluent disposal exemption permit	Implemented
		Adhere to Park Permit conditions	Implemented
Soil	Soil Pollution	Minimize the loss of soil as an ecological resource and limit the impacts on soil functionality.	Implemented
	Soil erosion		
Visual	Visual disturbance	Limit visual impacts to views from Bloedkoppie and the Swakop River battlefields	Implemented
	Aesthetic impacts to final land forms	Adhere to Park Permit conditions	Implemented
Archaeology	Disturbance to archaeological and heritage sites	Prevent the unacceptable loss of archaeology and cultural sites.	Implemented
	Loss of archaeological and heritage information	Adhere to Park Permit conditions.	Implemented
Noise and Vibration	Noise pollution from blasting	Limit excessive noise and vibration impacts to visitors at Bloedkoppie and the near the Swakop River boreholes.	Implemented
	Vibration from blasting	Adhere to Park Permit conditions.	Implemented
Safety and Security	Physical harm to third parties and animals	Avoid Mine site access by unauthorised people.	Implemented
		Adhere to Park Permit conditions.	Implemented
Radiological	Radiation health impacts	Prevent radiation related health impacts	Implemented
			Implemented
Socio-Economic	Employment creation	Enhance positive socio-economic impacts and limits the negative impacts	Implemented
	Local economic development		Implemented
	Road Safety		Implemented
	Stakeholder consultation		Implemented
	Social wellbeing and community development		Implemented
Rehabilitation and Restoration	Failure of Rehabilitation	Successfully rehabilitate all disturbed areas resulting from mining activities.	Implemented
			Implemented

B.6.2. Environmental Management Performance Feedback

Fifteen (15) Environmental monitoring and mitigations plans (MMP) were identified to give effect to the LHU EMP implementation. These 15 programs were developed and implemented in accordance with the International Organisation of Standardisation (ISO) 14001:2004 / South African National Standard (SANS) 14001: 2005 (Environmental management) system requirements.

Below follows the progress made against the EMMP commitments for the period 1 July 2017 to 30 June 2020

B.6.2.1. Stakeholder Consultation / Communication MMP

LHM is located within the Namib Naukluft National Park (NNNP), so whilst LHM does not have communities bordering the mine lease, there are a number of stakeholders (local, regional, national and international) that have an interest in how the operations is conducted in the Park. During this reporting period LHU implemented the following stakeholder and communication management and mitigation measures.

Maintain Stakeholder Register

LHU have established and is maintaining a stakeholder register that was initially developed during the Environmental Impact Assessment (EIA) processes conducted for the operation. This register is reviewed and updated on a regular basis. Table 11 below reflects LHU's current Stakeholder Register.

Table 11: Langer Heinrich Uranium Stakeholder Register

STAKEHOLDER CATEGORY	KEY STAKEHOLDER
Key Regulators	Office of the Minister of Mines and Energy
	Office of Commissioner of Mines and Energy
	Office of the Chief Inspector of Mines
	Office of the Inspector of Labour
	Ministry of Mines and Energy
	Ministry of Environment and Tourism
	Ministry of Water Affairs and Forestry
	National Radiation Protection Authority
	Inland Revenue
International Regulators	IAEA
Local Authorities	Erongo Governor Office
	Office of the Mayor of Swakopmund
Strategic Service Providers	NamWater
	NamPower
	NamPort
Banking Industry	Bank of Namibia
	Nedbank
	Bank Windhoek
Mining Industry Association	Chamber of Mines of Namibia Council
	Chamber of Mines HR Committee
	Chamber of Mines Safety Committee
	Chamber of Mines Environmental Committee
Namibian Uranium Industry Association	NUA Directors/Trustees meeting
	Namibian Uranium Association (NUA) Sustainable Development Committee meeting
	NUA Water and Air Quality Working Group meeting
	NUA Services working group meeting
	NUA Swakop River Farmers Group working group meeting
	NUA Radiation Safety working group meeting
	NUA Communication working group meeting
Current Service providers	Vendors
	Contractors
Media	Local Media (Newspaper)
	National Media (Television, News Papers and Radio)
	International Media (Television, News Papers, Radio and Various Social Medium Platforms e.g. Face book, Twitter etc.
Community Members	Local Community
	International Community
	NGO's
	Pressure Groups
Employees	Current Employees
	Former Employees

Engaging with identified stakeholders

LHU considers its stakeholders to include both those who have the potential to be impacted by and those that could impact on a project. LHU has a broad range of stakeholder. LHU regularly consults and engages with its stakeholders, recognising the importance of listening to and understanding the issues raised by them so that the Company can respond effectively. Stakeholder consultation is undertaken through formal and structured meetings as well as through informal and ad hoc communication. Feedback of key stakeholder engagement sessions that occurred during this reporting period is provided below (Table 12).

Table 12: Key Stakeholder Engagement Sessions during this reporting period

Stakeholder Category	Stakeholder Type	Engagement	Frequency
Internal	Employees (LHU and contractors) and Site visitors.	SHER Awareness and Training sessions attended by Employees (LHU and contractors) and Site visitors.	Daily
		SHER performance feedback session attended by Employees (LHU and Contractors) and Site Visitors	Monthly
		OH&S Representative meetings.	
	LHU Workforce	LHU workforce meetings	Weekly
External	Namibian Uranium Industry	Participate and attend Namibian Uranium Association (NUA) Trustee Meetings	Quarterly
		Participate and attend Namibian Uranium Association (NUA) Sustainability Committee Meetings	
		Participate and attend Namibian Uranium Association (NUA) Radiation Safety Working Group Meetings	
		Participate and attend Namibian Uranium Association (NUA) Water and Air Working Group Meetings	
		Participate and attend Namibian Uranium Association (NUA) Services Working Group Meetings	
		Participate and attend Namibian Uranium Association (NUA)Communications Meetings	
		Participate and attend Namibian Uranium Association (NUA)Swakop Rivers Farmers Meetings	
	Namibian Mining Industry	Participate and attend Chamber of Mines of Namibia Human Resources Committee Meetings	Quarterly
		Participate and attend Chamber of Mines of Namibia Council Meetings	
	Regulators	Engagement sessions occurred with a representatives of the following Namibian regulatory bodies: National Radiation Protection Authority of Namibia Department of Water Affairs Ministry of Environment and Tourism Ministry of Finance	Ad-hoc
	National Authority	Attended Town hall meeting with HE President of the Republic of Namibia	Annually
	Local Authority	Quarterly engagements sessions took place between LHU and the Governor of the Erongo Region	Quarterly
	Key State Owned Enterprises	Operations meeting with NamWater	Quarterly
		Engagement session occurred with NamPower	Annually

B.6.2.2. Safety and Security MMP

The objective of this programme is to prevent physical harm to third parties and animals from potentially hazardous excavations and infrastructure. Feedback on key Safety and security activities for the reporting period is provided below:

Mine Site access

Authorised site access into ML140 and ML172 can be only be gained through the "Remote Access Gate" that is located at the western site of the mine lease areas and can only be obtained once site visit approval has been granted by the Managing Director. LHU has outsourced its Security Services to Omega Security who deployed unarmed uniformed Security Officers Mondays to Sundays between 06h30 and 19h00 at the Western remote access point. The eastern site gate that allow entrance into the mining area is permanently locked. Both gates are locked, the keys are held by the Security Officers with a formal key issuing and return system in place. See below (Figure 12).

Figure 12: Site access control at Langer Heinrich Uranium Mine (LHM).

Visitors

Prior to entering the remote access gate all visitors are requested to display their letter of invitation and a valid Park Permit, without which they are denied access to site. LHU has a zero tolerance policy towards the use of alcohol and drugs and all vehicle drivers and passengers are tested for alcohol. No person is permitted onsite if the alcohol test is positive. A notice board displaying amongst others mandatory alcohol testing (Figure 13).

Figure 13: Site access control at Langer Heinrich Uranium Mine (LHM).

All personal property (e.g. laptops, camera's etc.) must be declared and visitors have to sign the visitors register managed by the site Security Manager. Upon entrance approval, visitors received general site induction. The visitor will remain at the main access area until collected by their host. No site visitor is allowed to move around the site on their own. The host will escort the visitor who must signed out at the main gate. No visitor is allowed to move around the site on their own and is at all times accompanied by his or her host. All visitors are also subjected to security checks, prior to leaving the site.

Employees, Contractors (Service Providers and Product Suppliers)

All authorised employees (LHU and long term contractors) are registered on LHU's Bio-metric access control system and have access to site via this system. .Those contractors not registered onto the Bio-metric system enters the site via main security office. Stringent access and egress control measures are in place with daily security checks being carried out. Equipment can only be released if cleared by the Radiation Section who issue a radiation clearance certificate. Vehicles are checked daily through a random selection process.

SHER Induction and Training

LHU's risk management process requires that all activities, products and services are subject to the identification of associated Occupational Health and Safety hazards and risks, Environmental impacts and risks which must be evaluated to determine the associated risk level. Appropriate measures are identified and implemented to ensure the risk levels are mitigated to a risk level as low as is reasonably practicable.

All employees (LHU and Contractors) and site visitors are inducted at the mine site and received risk based SHER training appropriate to the level of risk.

Alcohol and Drug Testing

All employees (LHU and Contractors) and site visitors were subjected to the daily alcohol test prior to entering the site (Figure 13). In March 2020 a directive was communicated by the

Ministry of Mines and Energy to suspend alcohol testing at all mining operations. This directive serves as a mitigation measure to prevent the spread of COVID-19. LHU has since implemented an alternative method to prevent intoxicated individuals from entering the mine lease site, in addition; all drug testing random alcohol testing has also been suspended until the aforementioned directive is revoked.

Vehicles and Driving

Only authorised employees (LHU and Contractor) are permitted to operate vehicles on and within the LHU jurisdiction. Adhering to speed limitations forms part of general site induction. Speed tracking devices has been installed in all LHU owned vehicles and the speed of drivers are checked daily for any deviations. LHU's disciplinary policy is activated in the event of any speed violations. During this reporting period, zero disciplinary processes were instituted against any employee.

LHU enlisted the services of a local contractor (Quiver tree) to maintain the LHU access road every six weeks. Vehicle usage on the access and internal roads have been significantly reduced both in terms of numbers of vehicles used and frequency of movement on the roads.

Emergency Response Management

LHU has a dedicated Emergency Response Team whom is responsible for the execution of LHU Emergency Response Plan and managing of any emergencies they were trained for.

Reportable incidents

The safety and security of all individuals (LHU employees, contractor employees and site visitors) within and on the premises of LHU is of great importance to the LHU management, the ongoing management (mitigation and improvement) of Occupational Safety & Health, Radiation and Environmental aspects remains a priority. LHU has operated within the required Occupation Health and Safety regulations and will continue to operate within the required legal requirements. There were no occupational safety injuries or occupational diseases that required reporting to the Authorities.

B.6.2.3. Biodiversity MMP

During this reporting period LHU implemented the following Biodiversity management and mitigation measures.

Prevent or limit the unacceptable loss of biodiversity and related functionality through physical disturbance associated with all mining and processing related activities within the ML 140 and ML 172.

No new land was disturbed during this reporting period resulting in a 980ha of cumulative total land being disturbed within ML 140 and ML 172, whilst the total undisturbed and rehabilitated land equates to 6 355ha. This information is presented below (Table 13).

Table 13: Land impacted (disturbed, undisturbed and rehabilitated) as at 30 June 2020.

Type (disturbed, rehabilitated, undisturbed)	Impacted land (ha)
ML 140 area	4,375
ML172 area	2,999
Total area of Lease Site	**7,374**
Impermeable surface	86
Mine Pit	229
Tailings Storage Facility	231
Water Storage Facilities	3
Waste Rock Dumps	327
Run of Mine area	104
Total Disturbed Land	**980**
Total Rehabilitated Land	39
Total Rehabilitated and Undisturbed Land	**6,355**

Prevent the unacceptable loss of biodiversity and related functionality through a reduction in the key ecological drivers of groundwater and temporary surface water flow.

Groundwater and surface water was managed through the LHU Water Management Program. Detailed information on the management of ground-and surface water during this reporting period is provided in the Groundwater and Surface water Monitoring and Mitigation Programs.

Prevent disturbance to biodiversity.

There were no new activities that resulted in biodiversity disturbance.

LHU's Park permit was renewed quarterly. All new employees (LHU and contractors) and visitors receive induction where Park Permit conditions are discussed.

Daily security checks are conducted on all employees (LHU & Contractor), visitors and to determine whether all items are authorised to leave site. No incidents of unauthorised removal of any items inclusive of fauna and flora were reported during the period.

Various wildlife (Springbok, Oryx, Zebra and Ostrich) continued to be sighted and reported in and around the ML 140 and ML 172 areas.

LHU's general site induction program includes amongst other the reporting of environmental incidents (e.g. killing or relocation of fauna or illegal removal and destruction of flora). There were no environmental incidents that required the submission of a formal report to the relevant Authorities during this reporting period.

B.6.2.4. Rehabilitation and Restoration MMP

The purpose of the rehabilitation/restoration management and mitigation plan is to successfully address, control and mitigate the long-term well-being of the environment and to lay down the philosophy of rehabilitation. Feedback on key Rehabilitation and Restoration activities for the reporting period is provided below.

Land disturbance, rehabilitated and restored

During this reporting period there was no new land disturbed land nor were any land rehabilitated or restored. Further information is provided above in Table 13.

Restoration Management

A Code of Practice for Restoration Activities was developed, documented and reviewed. This document contains information about the reasoning for an onsite nursery, nursery operational and maintenance activities, propagation techniques, transplanting and out planting operational activities, seed harvesting techniques and an approach for monitoring and research trials.

Closure Management

Closure arrangements are integrated into the EMP, which was submitted for the application of an environmental clearance certificate. In addition a Closure Management Plan exists, which is reviewed and updated periodically.

B.6.2.5. Surface Water / Storm Water MMP

Namibia's climate is hot and dry with erratic rainfall. Water is a scare resource in Namibia, particularly along the west coast. This are received less than 10mm of rain annually and is almost completely barren. Besides rain being scarce, it is also hardly predictable. During this reporting period LHU implemented the following Surface management and mitigation measures.

Prevent pollution of surface water.

Pollution of surface water may occur at LHM if; industrial effluent, domestic effluent, tailings material, or hazardous materials (reagents etc.) is discharged into the environment. Water movement which may in an unmanaged scenario result in surface water pollution was monitored and reported (Figure 14 to Figure 18).

There was no surface water run-off. The annual rainfall recorded for between 01 July 2017 and 30 June 2020 were recorded as 28.50mm. Further information on rainfall between 01 January 2007 and 30 June 2020 is provided below (Figure 14).

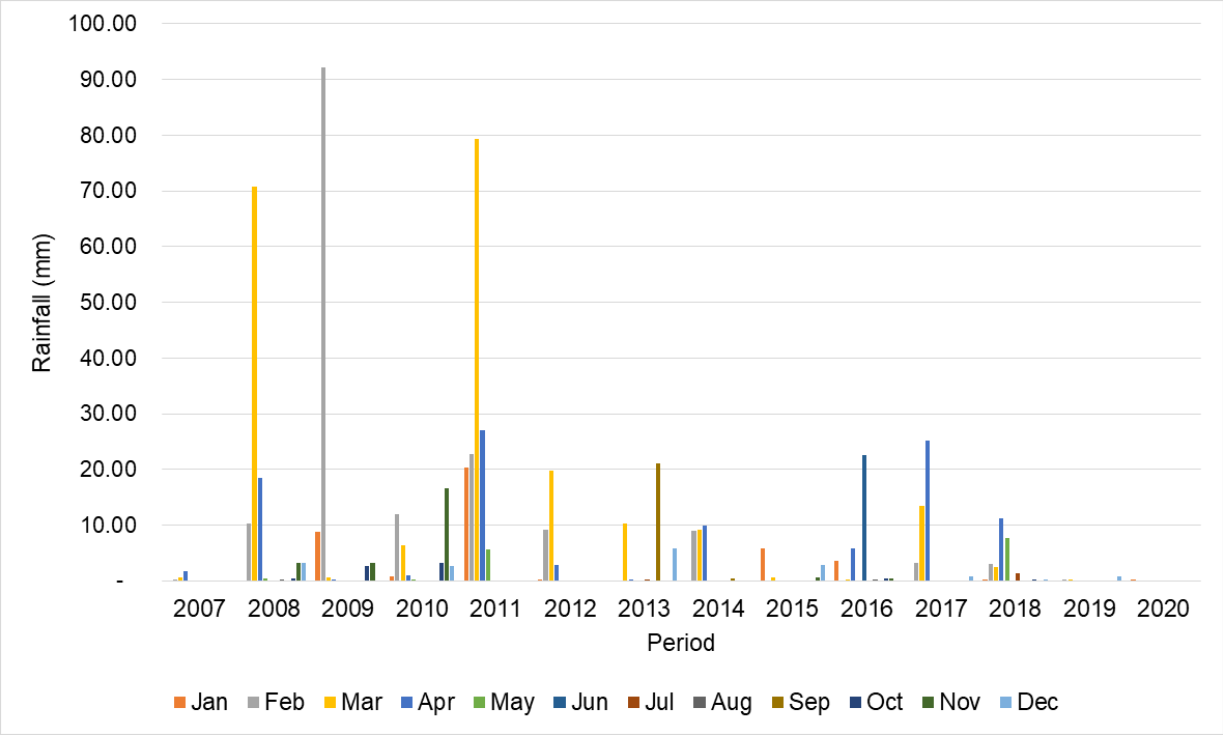


Figure 14: Annual rainfall (mm) for the period January 2007 to 30 June 2020.

Recovered Tailings Solution

There was no discharge of tailings solution or slurry into the environment. Between July 2017 and March 2020 1,402,444m^3 volume recovered tailings solution was returned from TSF #2 (17%), TSF #3 (38%) and TSF #5 (45%) into the Process Pond. Further information is provided below (Figures 15).

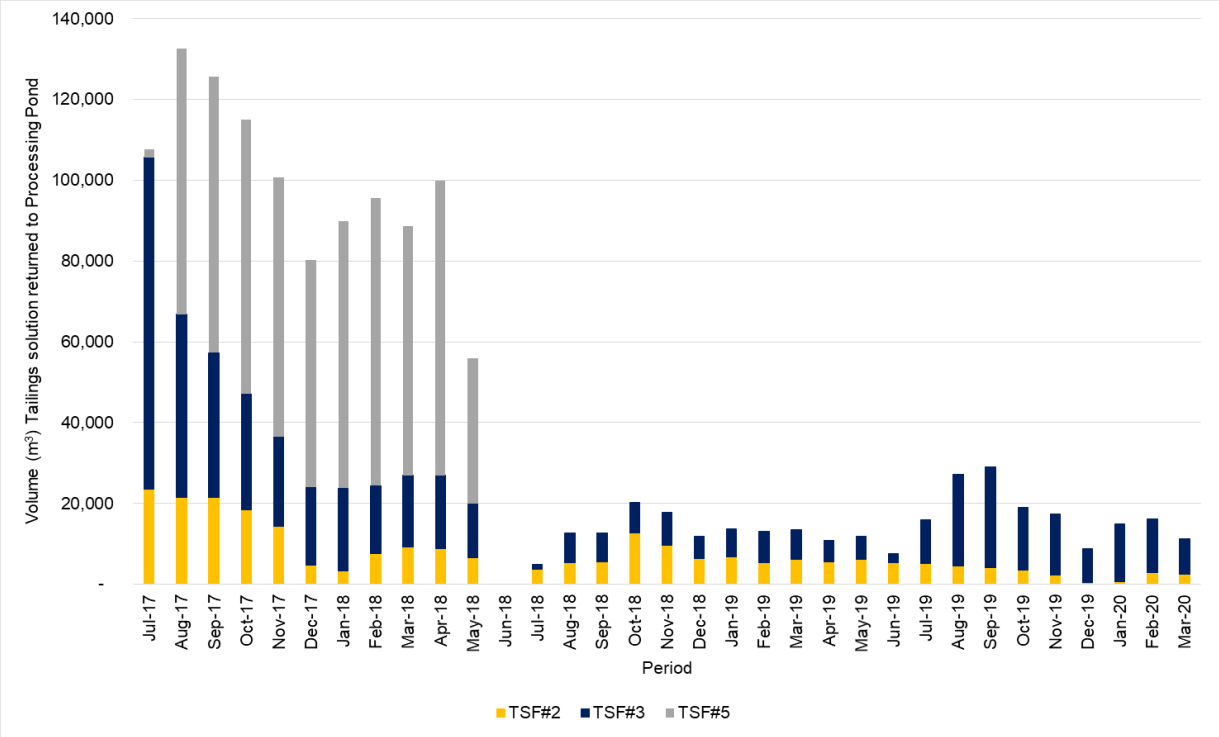


Figure 15: Volume (m^3) of recovered tailings solution from TSF (TSF #2, TSF #3 and TSF #5) discharged into (m^3) to Process Pond between 1 July 2017 and 31 March 2018.

The TSF #5 return water system was modified to recirculate the recovered tailings solution through two discharge points (number 1 and number 2) of this facility. This initiative was adopted to assist in the evaporation of the water over time.

Between July 2018 and January 2020 257,864m^3 volume recovered tailings solution was recirculated inside TSF #5. Of this recovered solution, 45% was recirculated inside TSF #5 via riser #1 and 55% recirculated via riser #2. This information is presented below (Figure 16).

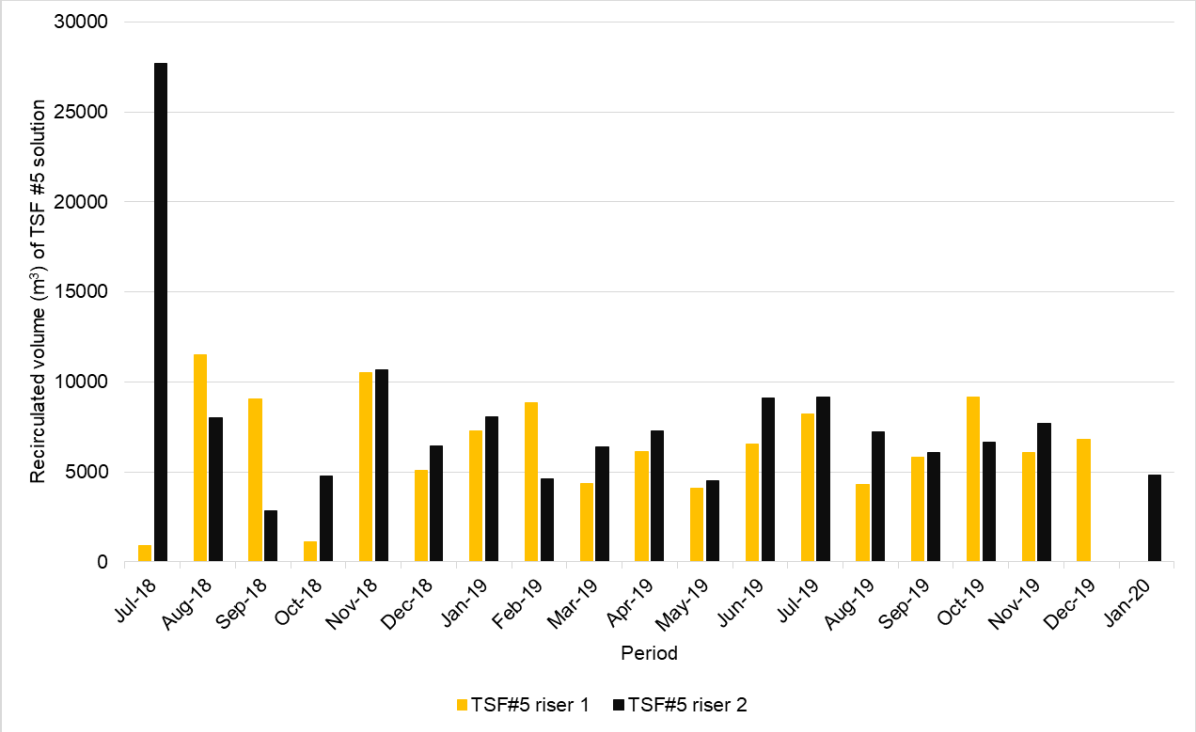


Figure 16: Monthly recirculated recovered tailings solution (m^3) inside TSF #5 between 1 July 2018 and 31 January 2020.

Domestic effluent (included grey water from the laundry, change house, kitchen and ablution facilities) flowed into the Sewage Treatment Plant (STP), where it is treated and pumped into the Process Pond where it was re-use during operations and recirculated inside TSF#5 to evaporate. Further information is provided below (Figure 17).

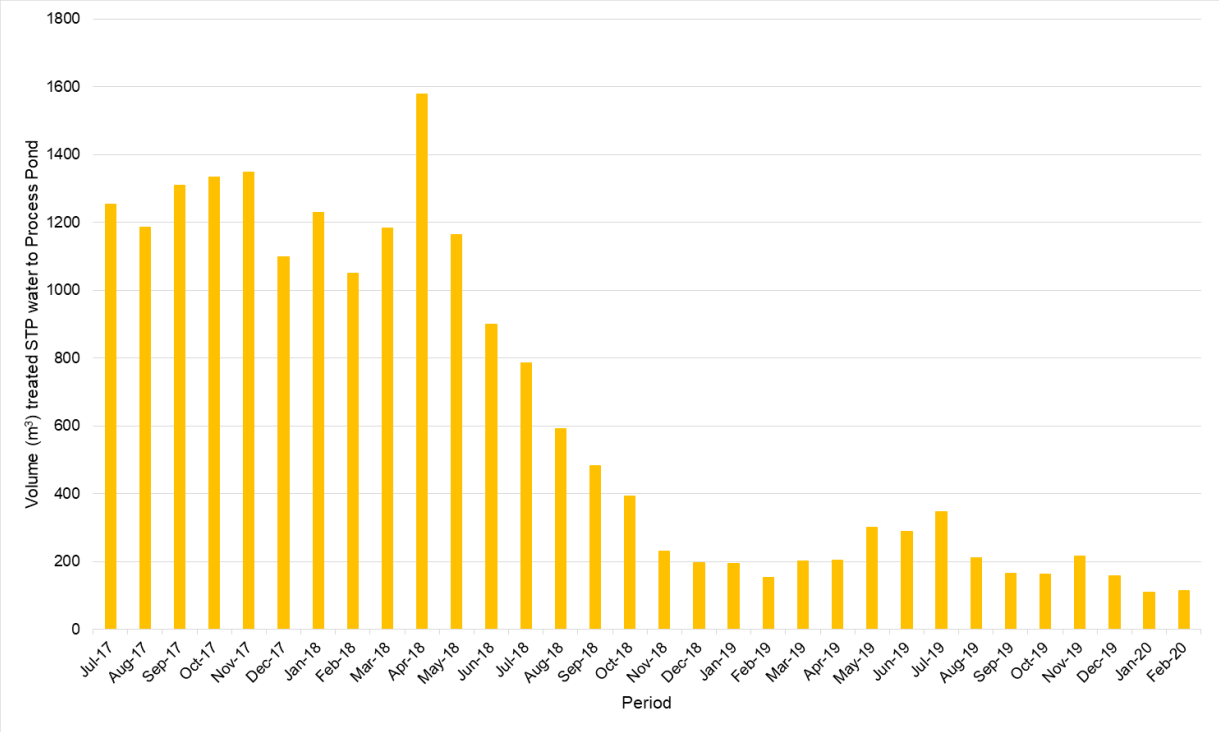


Figure 17: Monthly volume (m^3) treated and returned water from STP to Process Pond between 1 July 2017 and 29 February 2020.

The TSF's (TSF #2 and #3) and the Sewage Treatment Plant (STP), return water systems were modified to discharge the recovered tailings solutions and STP solutions directly into TSF #5. This initiative was adopted to assist in the evaporation of the water over time and to clean the Process Pond. Between 1 March 2020 and 30 June 2020 6,690m^3 recovered tailings solution from TSF's and recycled solution from the STP were discharged into the TSF #5. This information is presented below (Figure 18).

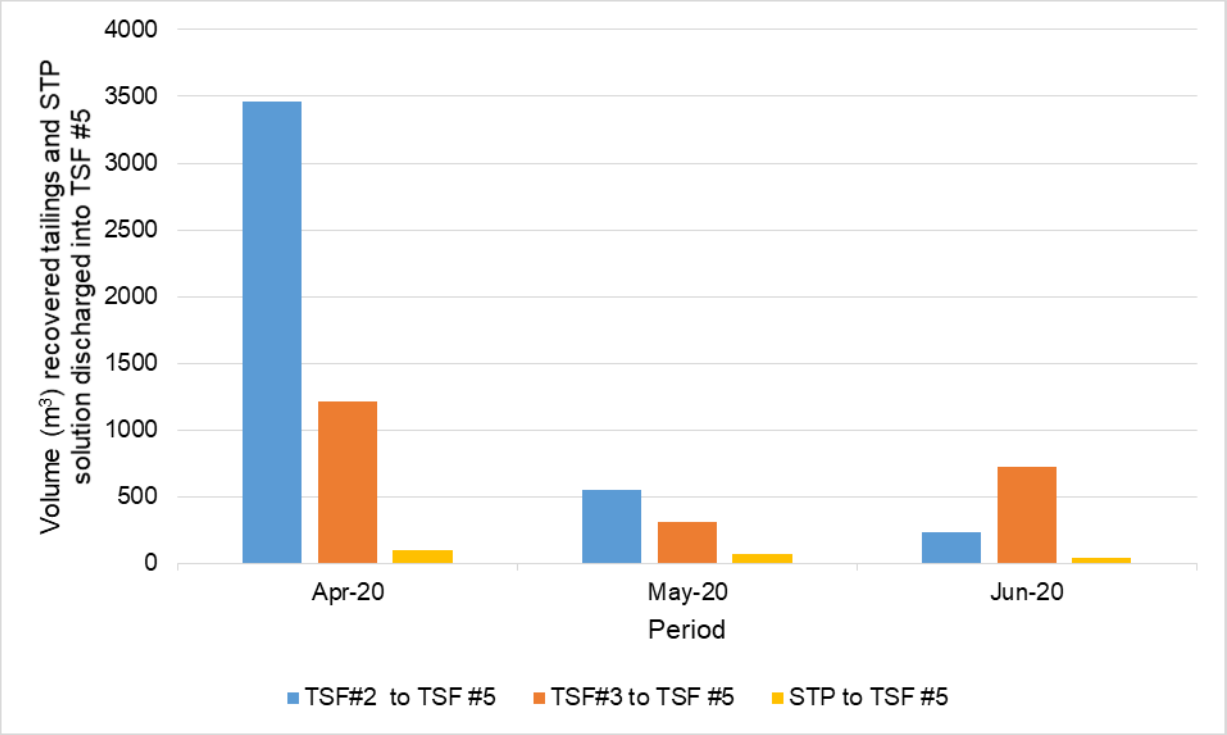


Figure 18: Monthly volume (m^3) of recovered tailings solution and STP solution discharged into TSF #5 between 1 April 2020 and 30 June 2020.

LHU continued operating within compliance of the permit conditions as stipulated in the Wastewater and Effluent Disposal Exemption Permit (Permit Number 669) which include the following:

- LHU have in place a C&M Maintenance and Engineering team who is responsible for the maintenance of equipment including; pipes, drains, pumps and valves.
- Incidents are reported, recorded, investigated and remediated in accordance with the LHU Incident Management Procedure.
- LHU's Emergency Response Plan includes provisions for environmental emergencies.
- LHU have a comprehensive Water Monitoring Program in place that meets as a minimum the relevant permitting conditions.

During the reporting period there were no reportable incidents recorded that required reporting to the authorities.

B.6.2.6. Groundwater MMP

The Management commitments pertaining to groundwater are related to preventing and minimizing the loss of groundwater to other users and pollution related impacts of groundwater through LHM operational activities. Feedback on key Groundwater activities for the reporting period is provided below:

<u>Groundwater monitoring program</u>

A significant monitoring bore network has been established across the Langer Heinrich mining leases, down-gradient of the main mining and tailings storage areas and within the Swakop River. A total of 30 bores are registered with DWAF and are assigned WW designations and

are the subject of this monitoring report. A revised monitoring plan was compiled following the decision to place LHM on Care and Maintenance. This revised monitoring plan supersedes the 2016 plan. Water levels are measured monthly and water samples are collected in accordance to the groundwater sampling program. The samples are submitted for a complete chemistry analysis by an external laboratory. A summary of the Groundwater level and Groundwater quality monitoring programmes as approved by DWAF are presented below (Table 14 and Table 15):

Table 14: DWAF approved Groundwater level monitoring program

Bore Identification	Location	Groundwater level monitoring program
WW41191	Swakop River	Annually, after runoff events
WW41190	Swakop River	Monthly
WW41189	Swakop River	Monthly
WW41188	Swakop River	Monthly
WW41184	Swakop River	Monthly
WW41183b	Swakop River	Monthly
WW41183a	Swakop River	Monthly
WW41182	Swakop River	Monthly
WW41181	Swakop River	Annually
WW41180	Gawib off Lease	Monthly
WW41179	Gawib off Lease	Monthly
WW41178	Gawib off Lease	Monthly
WW203595	East	Monthly
WW203594	West	Annually
WW203547	Swakop River	Monthly
WW203546	Swakop River	Monthly
WW203545	Swakop River	Monthly
WW201763	Gawib off Lease	Annually
WW201762	Gawib off Lease	Annually
WW201761	Gawib off Lease	Annually
WW201760 (TM34)	Gawib off Lease	Monthly
WW201759 (TM33)	Gawib off Lease	Monthly
WW201758 (TM32)	Gawib off Lease	Monthly
WW201757 (TM31)	Gawib off Lease	Monthly
WW200890	Swakop River	Monthly
WW200889	Swakop River	Monthly
WW200888	Swakop River	Monthly
WW200886	Swakop River	Monthly
WW200885	Swakop River	Monthly
WW200884	Swakop River	Monthly
WW200883	Swakop River	Annually
WW202216 (TM48A)	Gawib river upstream mining area	Annually, after runoff events
WW202215 (TM48B)	Gawib river upstream mining area	Annually, after runoff events

Table 15: DWAF approved Groundwater quality monitoring and sampling program

Bore Identification	Location	Water Chemistry Schedule
WW203595	East	Quarterly
WW203594	West	Quarterly
WW201758 (TM32)	Gawib off Lease	Quarterly
WW201757 (TM31)	Gawib off Lease	Quarterly
WW201763	Gawib off Lease	Annually
WW201762	Gawib off Lease	Annually
WW201761	Gawib off Lease	Annually
WW201760 (TM34)	Gawib off Lease	Annually
WW41184	Swakop River	Annually
WW41183b	Swakop River	Quarterly
WW41182	Swakop River	Quarterly
WW41181	Swakop River	Biannually
WW41180	Gawib off Lease	Quarterly
WW41179	Gawib off Lease	After rainfall runoff
WW41178	Gawib off Lease	After rainfall runoff
WW41190	Swakop River	Annual
WW200885	Swakop River	Annually
WW200889	Swakop River	Annually
WW203547	Swakop River	Quarterly

DWAF monitoring network

LHU compliance bore network constitutes 34 DWAF WW registered monitoring bores, two bores (WW200887, WW200890) were lost following the 2011 flood event. The majority (28) of DWAF WW registered monitoring bores are located immediately down-gradient of the LHU operations in the Gawib River and in the Swakop River. There are four WW series registered monitoring bores drilled into the palaeo-channel aquifer up and down-gradient of the current mining development on ML140. The location of the DWAF monitoring bores is provided below (Figure 19).

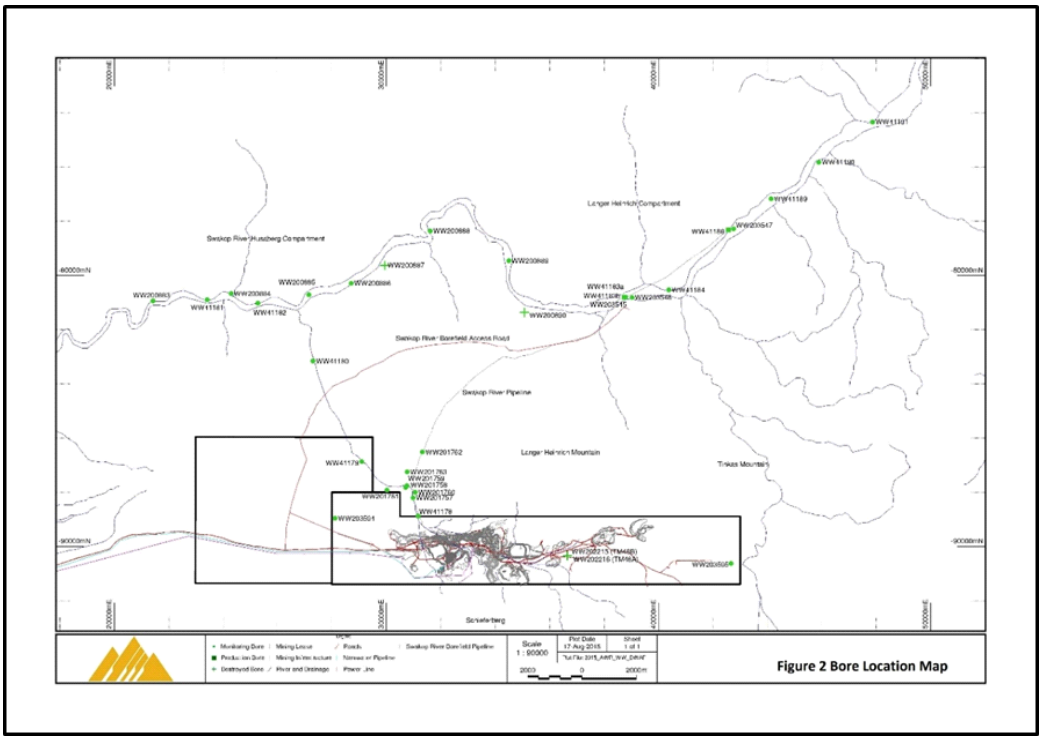


Figure 19: Location of compliance (DWAF) monitoring bores

<u>Prevent the loss of groundwater to farmers and vegetation (and ecosystems) in the region.</u>

<u>Groundwater abstraction</u>

LHU is permitted to abstract Swakop River Groundwater under Permit no. 10456, which is valid for a period of five years expiring 24 April 2021. This permit is presented below (Figure 20).

REPUBLIC OF NAMIBIA

MINISTRY OF AGRICULTURE, WATER AND FORESTRY

Telephone:	(061) 2087111	Department of Water Affairs
Fax:	(061) 2087697	Private Bag 13193
Enquiries:	J N Mouton	Windhoek
Reference:	9/3/3/2	9000

PERMIT NUMBER: 10 456 DATE: 25 APRIL 2016

PERMIT ISSUED IN TERMS OF REGULATIONS 5 AND 9 OF GOVERNMENT NOTICE R1278 OF 23 JULY 1971 AS PROMULGATED UNDER SECTION 30(2) OF THE WATER ACT, 1956 (ACT 54 OF 1956), AS AMENDED

NAME OF PERMIT HOLDER	:	The Manager, Langer Heinrich Uranium (Pty) Ltd
ADDRESS	:	P O Box 156, Swakopmund
DISTRICT	:	Swakopmund
VALIDITY PERIOD	:	5 (Five) Years
BOREHOLES TO BE USED	:	Serial numbers WW 41183a, WW 41183b and WW 41188
PURPOSE FOR WHICH WATER MAY BE USED	:	Industrial purposes
MAXIMUM ABSTRACTION	:	500 000m³ per year

This permit authorizes the holder (or his successors in title) to further abstract and use water for industrial purposes from existing boreholes identified as WW 41183a, WW 41183b and WW 41188 on the map attached as Annexure A, subject to the following conditions:

1. The validity period shall be from 25 April 2016 to 24 April 2021

2. This permit is incident to the property and if the present owner sells the property, the permit shall be handed over to the new owner.

All official correspondence must be addressed to the Permanent Secretary.

Figure 20: Swakop River Groundwater Abstraction Permit (permit no 10458)

This permit allows for the abstraction of Swakop River water from three boreholes (WW41183a, WW41183b and WW41188) to an annual abstraction limit of 500 000 m^3. During the period, no groundwater was abstracted from the Swakop River. This information is presented below (Figure 21). It is evident from this graph that LHU has never exceeded the amount of abstracted groundwater permitted.

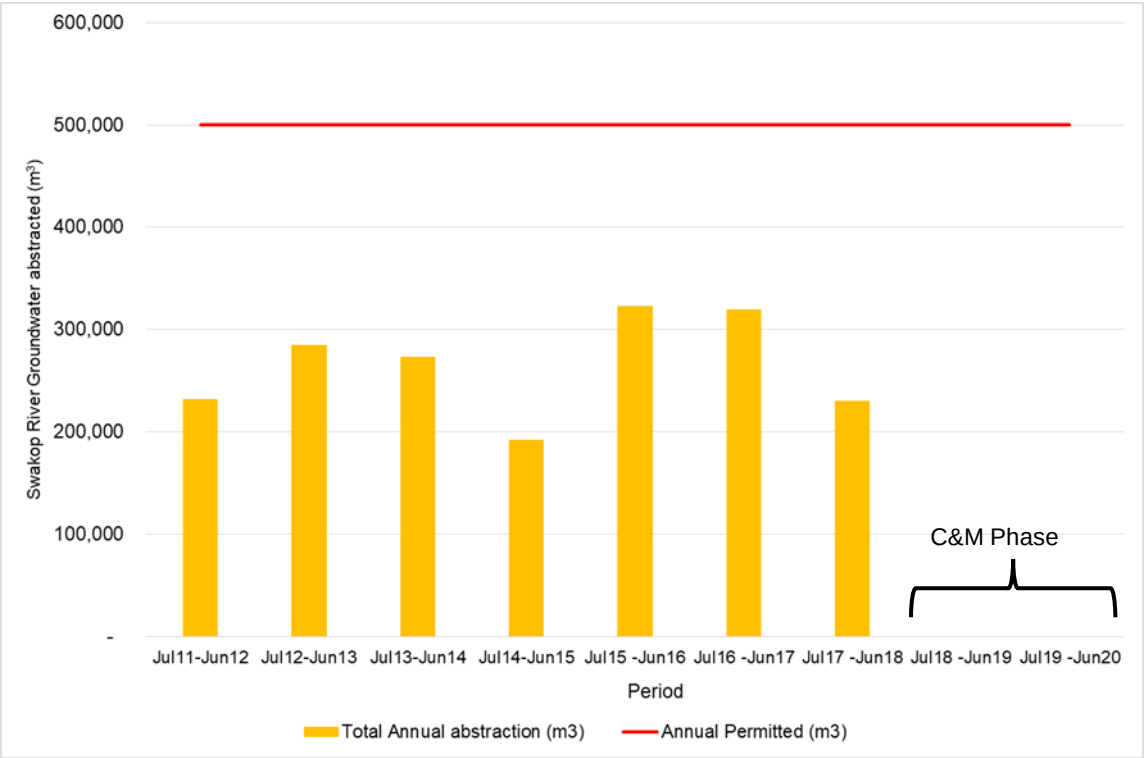


Figure 21: Swakop River Groundwater (m^3) abstracted between 1 July 2017 and 30 June 2020

Groundwater Levels

Groundwater water levels are routinely collected in accordance with the site sampling schedule which includes the collection of water samples either monthly or quarterly depending on the monitoring bore location and purpose.

There was no surface water run-off, the cumulative rainfall recorded between 01 July 2017 and 30 June 2020 amounted to 28.5mm (Figure 14). Groundwater levels in all monitoring bores continue to progressively and steadily decline following this last significant recharge event in March 2011.

The results of the monthly groundwater water level measurements within the Mining license areas, Gawib River and Swakop River as well as the changes between July 2012 and June 2020 is presented below (Figure 22 and Figure 23). Groundwater levels in monitoring bores fluctuate to base line levels.

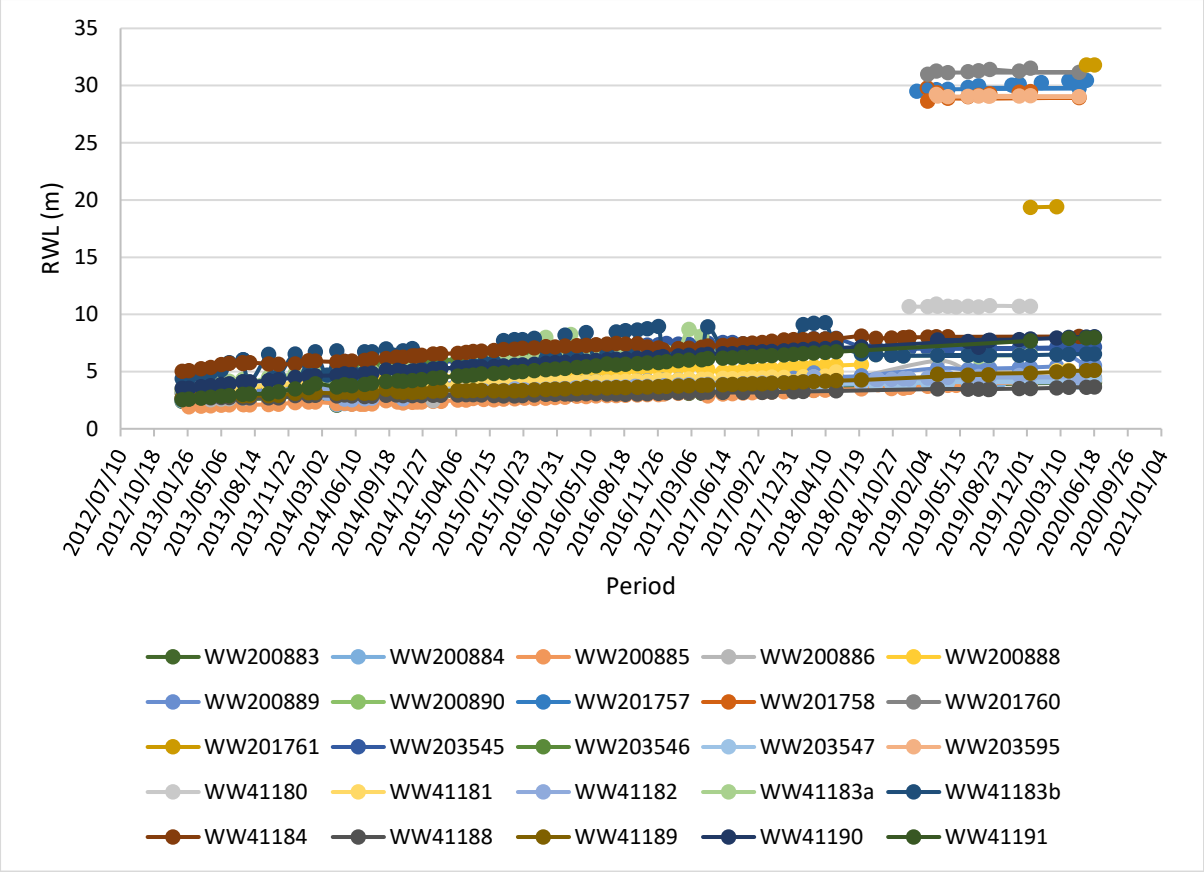


Figure 22: Groundwater level monitoring boreholes between 01 July 2012 and 30 June 2020.

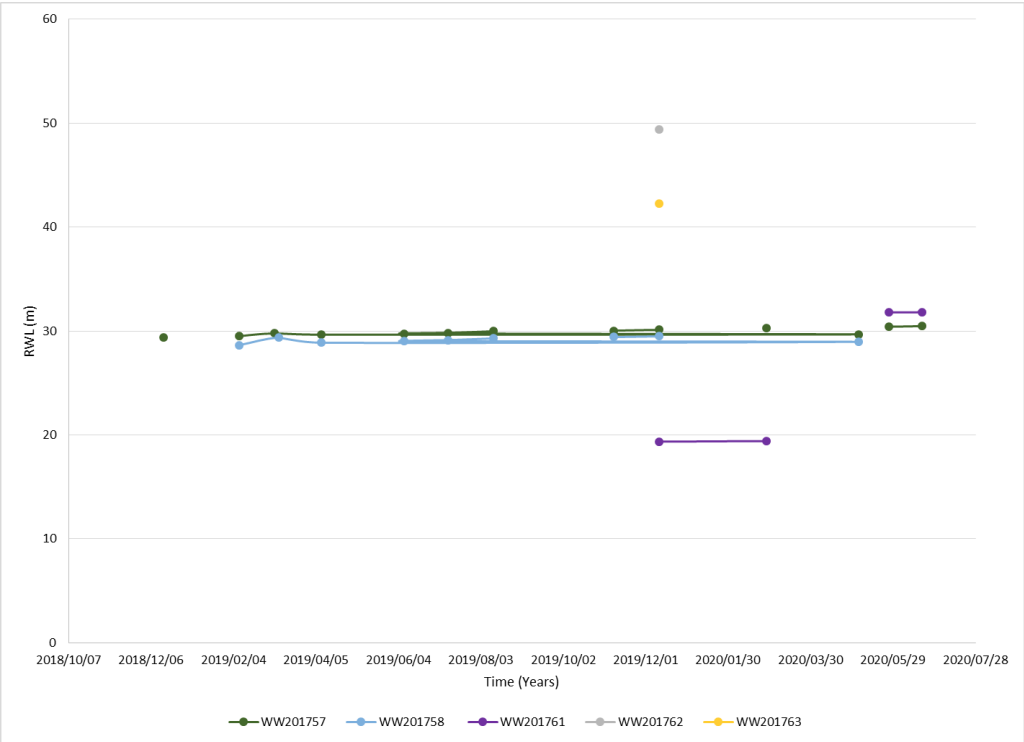


Figure 23: Gawib monthly Groundwater level monitoring boreholes between 01 July 2012 and 30 June 2020.

<u>Prevent unacceptable groundwater pollution related impacts.</u>

<u>Groundwater Quality</u>

Baseline values for the following key parameters have been derived from assessments collected from the monitoring bores screened in the palaeochannel lithologies and basement lithology:

- pH, salinity as EC or TDS, U and SO_4
- Arsenic, Vanadium and Uranium

The results of the monitoring programme shows that all tested parameters are all within baseline ranges and no deleterious trends have emerged.

Groundwater quality in all monitoring bores located in the Gawib River area extending from the northern pit crest down-gradient of the mine are within baseline ranges with no evidence of seepage from LHM operations. There are no impacts on the Swakop River water quality as a consequence of groundwater abstraction or mining activity at LHM.

Groundwater samples are routinely collected in accordance to the site sampling schedule as presented above in Table 15.

pH levels

Groundwater quality of the groundwater samples collected for this period is stable with pH in the range 6.5 to 8, whilst the groundwater salinity is variable reflecting different geology and variable groundwater recharge. This information is presented below (Figure 24).

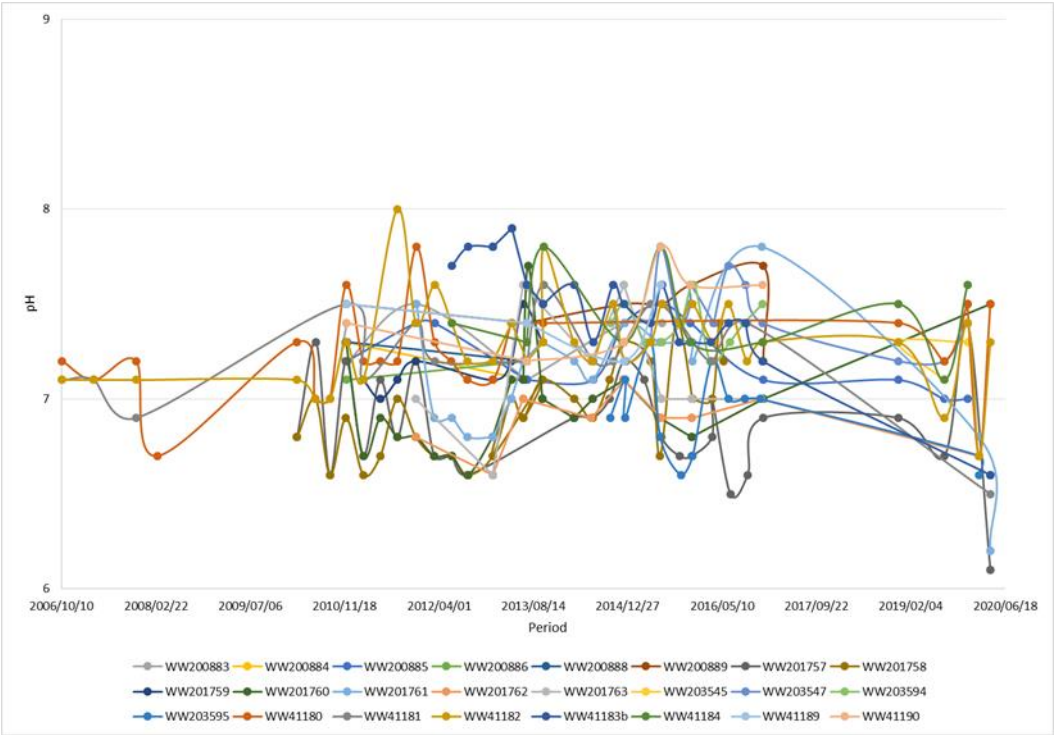


Figure 24: pH levels of WW-range boreholes for the period 2006 to June 2020.

Salinity (TDS)

There has been no change in groundwater salinity for the tested areas. Salinity continues to range from slightly brackish (~1,500mg/L TDS) to moderately saline (~13,500 mg/L TDS) in the basement rocks. Groundwater salinity in the tested bores has returned to established long term trends following the significant recharge event of February/March 2011 and are stable. Groundwater salinity generally increases in the direction of groundwater flow. This information is presented below (Figure 25).

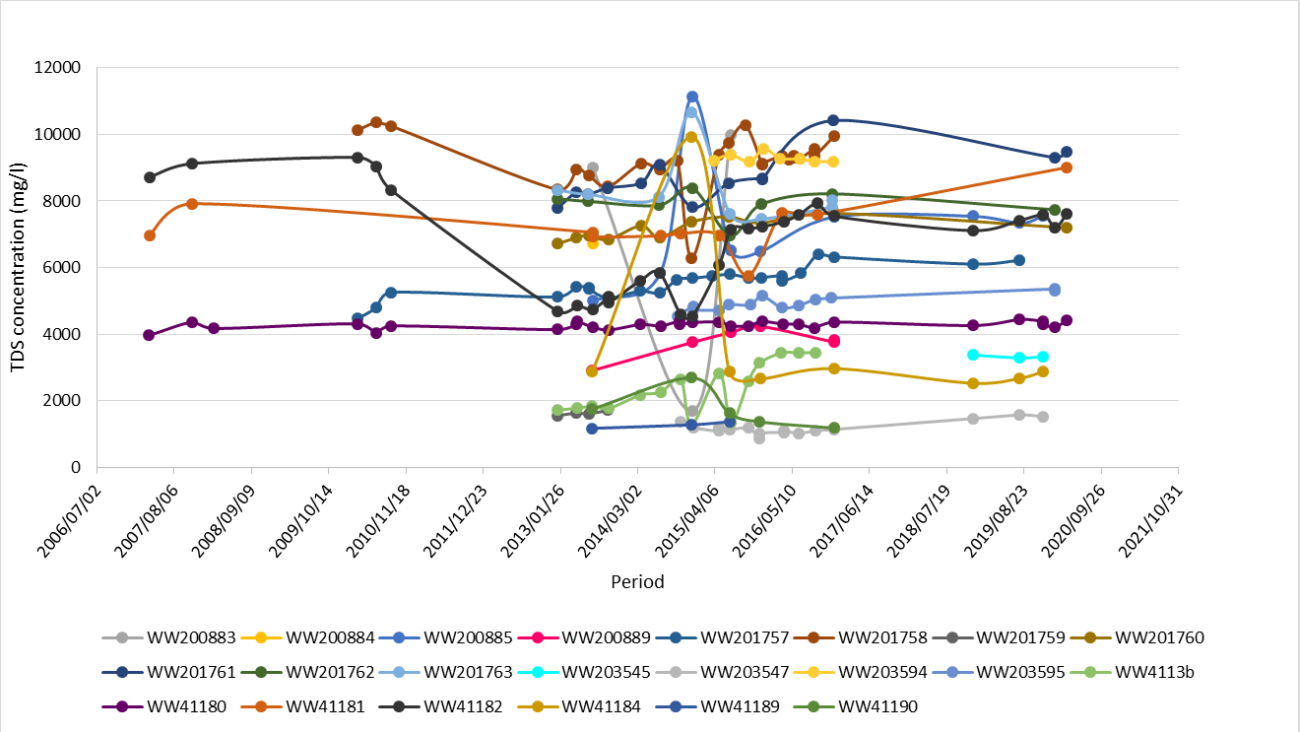


Figure 25: TDS concentration levels (mg/l) of WW-range boreholes between 01 July 2006 and 30 June 2020.

Uranium

Uranium concentrations in all monitoring bores are generally within baseline ranges, generally < 0.6 mg/L and are stable. This information is presented below (Figure 26).

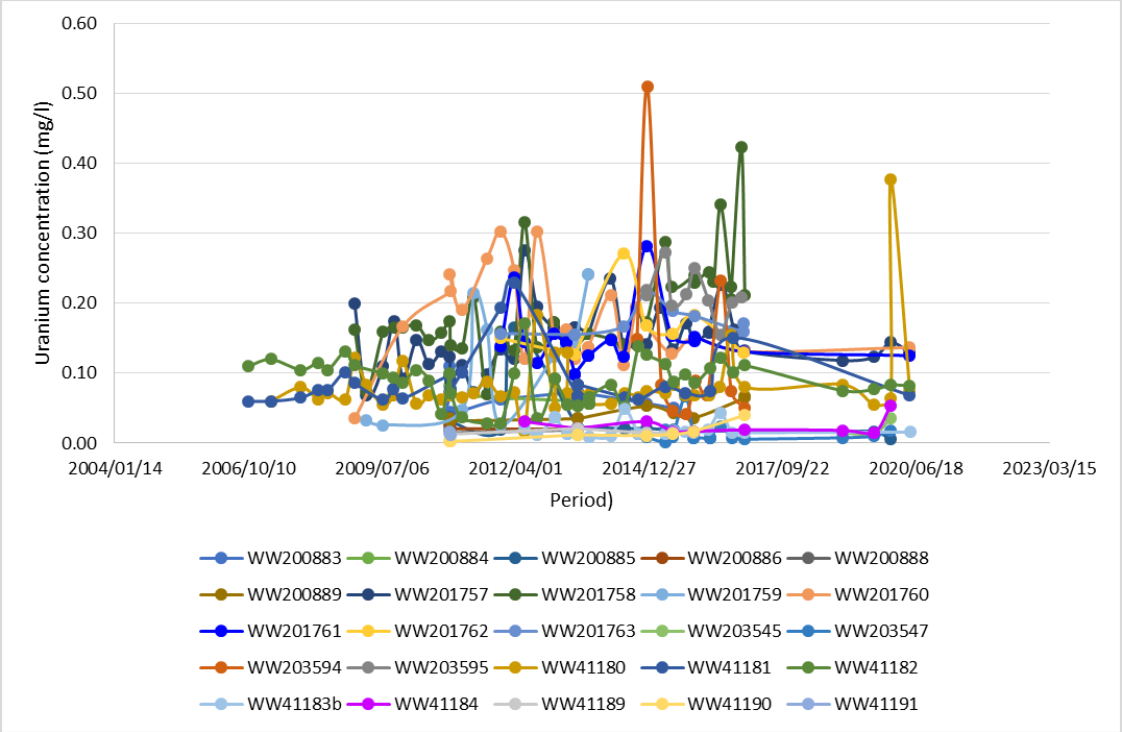


Figure 26: Uranium concentration levels (mg/l) of WW-range boreholes between 01 July 2006 and 30 June 2020.

Vanadium

Vanadium concentrations are < 0.3mg/L and stable within baseline ranges. This information is presented below (Figure 27).

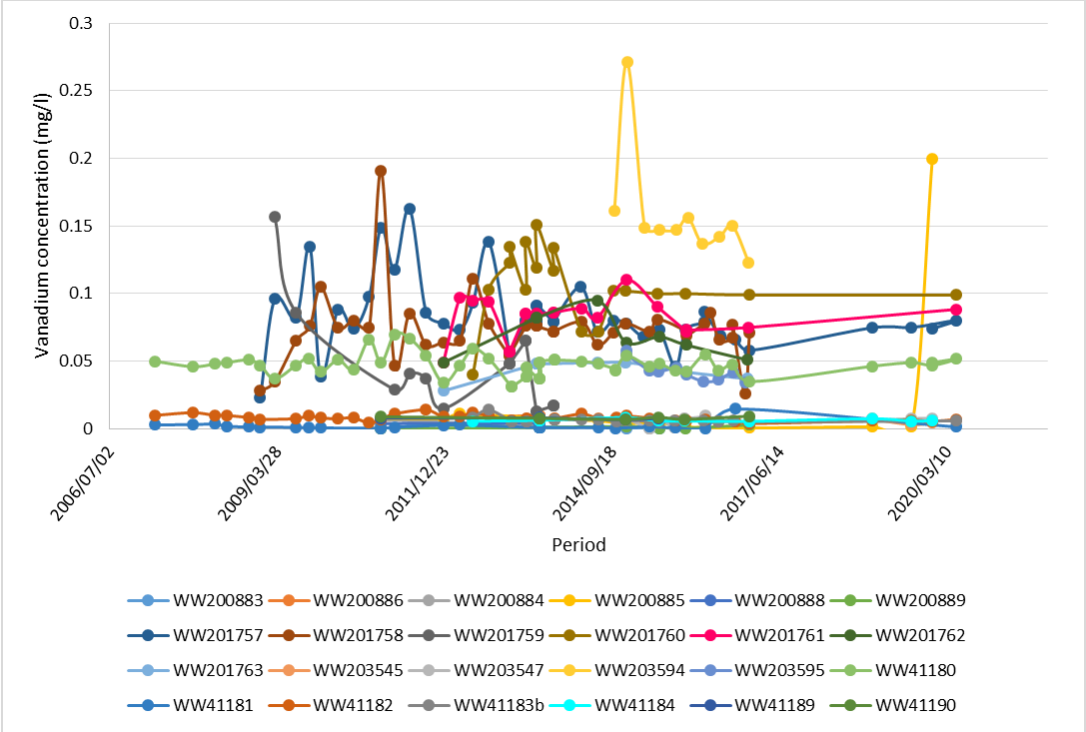


Figure 27: Vanadium concentration levels (mg/l) of WW-range boreholes between 01 July 2006 and 30 June 2020.

Arsenic

Arsenic concentrations are generally < 0.03ug/L and have been stable over the current review period. This information is presented below (Figure 28).

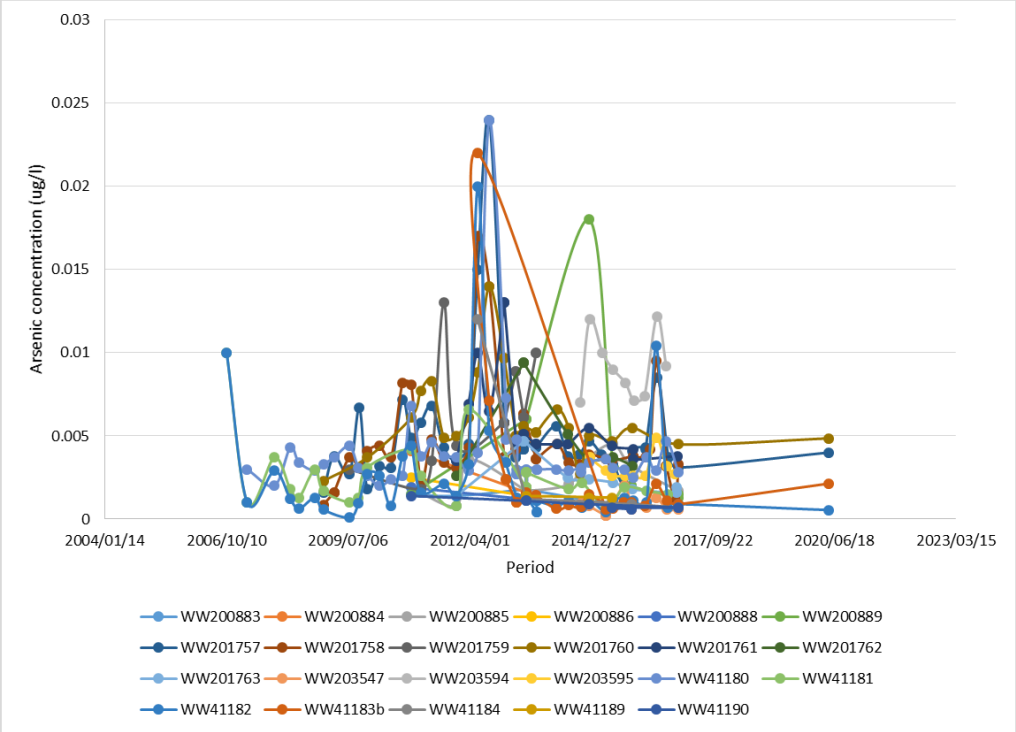


Figure 28: Arsenic concentration levels (mg/l) of WW-range boreholes between 01 July 2006 and 30 June 2020.

The results of the monitoring programme shows that all tested parameters are all within baseline ranges and no deleterious trends have emerged during the care and maintenance period. The current results indicate no impacts on the Swakop River water quality as a consequence of groundwater abstraction or mining activity at LHM.

Radionuclides:

Baseline values for the following radionuclides have been derived from assessments collected from the monitoring bores screened in the palaeochannel lithologies and basement lithology:

- Uranium Series (U238, U234, Th230, Ra226, Po210).
- Thorium Series (Th232).
- Actinium Series (U235).

The results of the monitoring programme shows that all tested parameters are all within baseline ranges and no deleterious trends have emerged. These results are available upon request.

Groundwater quality in all monitoring bores located in the Gawib River area extending from the northern pit crest down gradient of the mine are within baseline ranges with no evidence of seepage from LHM operations. There are no impacts on the Swakop River water quality as a consequence of groundwater abstraction or mining activity at LHM.

Reporting

During the period, LHU have submitted to the Ministry of Agriculture, Water and Forestry the following reports.

- Return of water abstracted during the month indicating the monthly abstraction.

- ECC-report for the period, 1 January 2019 to 30 June 2019.

No spills occurred that required evoking of LHU Emergency response procedure during this reporting period. During the reporting period there were no reportable incidents recorded that required reporting to the authorities.

B.6.2.7. Resource Usage MMP

The main resources consumed at LHM during this reporting period include; water, hydrocarbons and electricity. LHU remains committed to utilise these resources efficiently and seek ways to further reduce consumption and avoid waste. Feedback on key resource utilisation activities for the reporting period is provided below:

Freshwater

Water is sourced from two key sources, namely new water (NamWater, Swakop River groundwater and storm water) and recycled water.

NamWater

During the reporting period freshwater was sourced and used from NamWater via an existing water pipeline (NamWater pipeline and related infrastructure) runs alongside the C-28 for about 50km and then branches off to follow the LHU access road to site. The water is delivered to LHM from the Swakopmund reservoirs via a 300mm diameter pipeline. The section of water pipeline adjacent to the C-28 is located above ground, whilst the section adjacent to the LHM access road is underground. The incoming supply is measured via a flow meter and is stored in three tanks, each of 2,500m^3 capacity, and an high-density polyethylene (HDPE) covered fresh water pond with a capacity of,25 000m^3. The monthly (m^3) NamWater used are shown below (Figure 29).

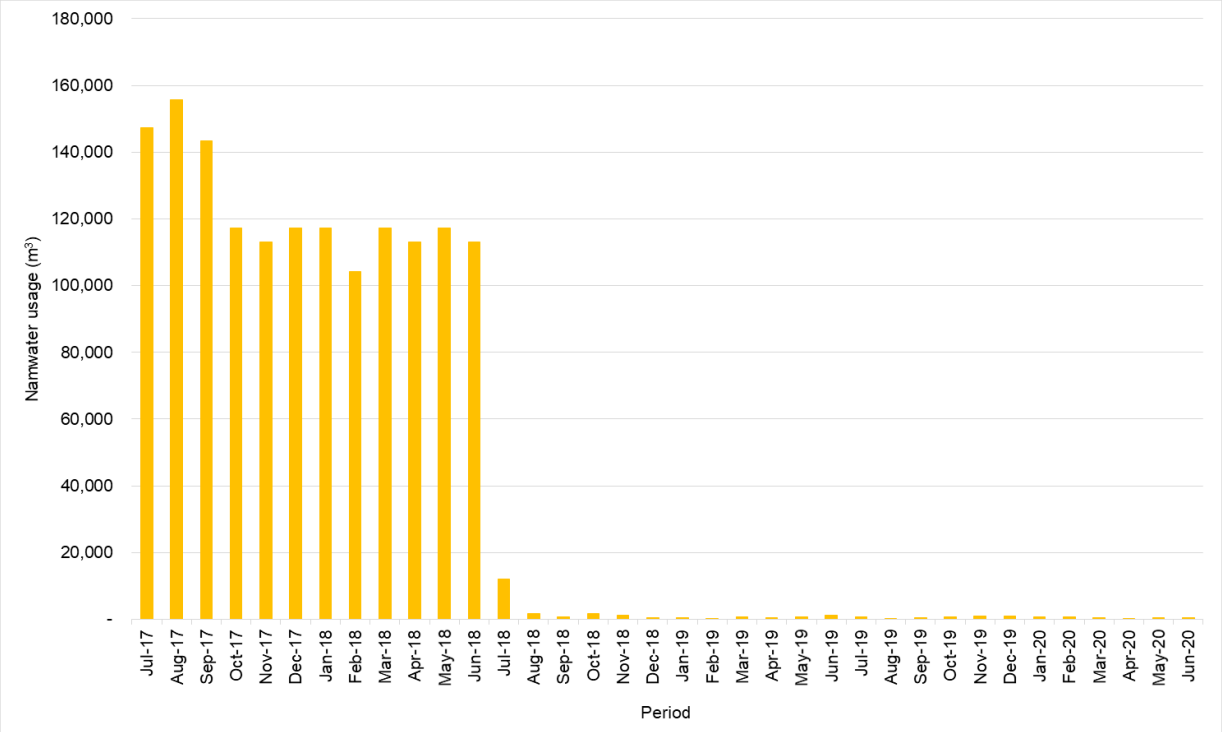


Figure 29: NamWater (m^3) new supply and monthly and cumulative used for the period 1 July 2017 to 30 June 2020.

Swakop River Groundwater

Swakop River Groundwater abstraction has always remained well below the license abstraction limit. No groundwater was abstracted between July 2018 and June 2020, when LHM was placed in care and maintenance. This information is graphically presented above (Figure 21).

Rainfall or stormwater

No rainfall run-off occurred during this reporting period.

Energy

LHU has four sources of energy that are used throughout its processes namely; Heavy Fuel Oil (HFO), unleaded petrol, diesel, and electricity.

Heavy Fuel Oil (HFO)

The HFO is supplied by NamCor to LHU. The HFO is stored on-site and used as fuel for the steam boilers. During the period 13,073,405 litres of HFO was used which equates to a calculated equivalent energy of 156,912,063kWh. The monthly volume of HFO (L) used is shown below (Figure 30).

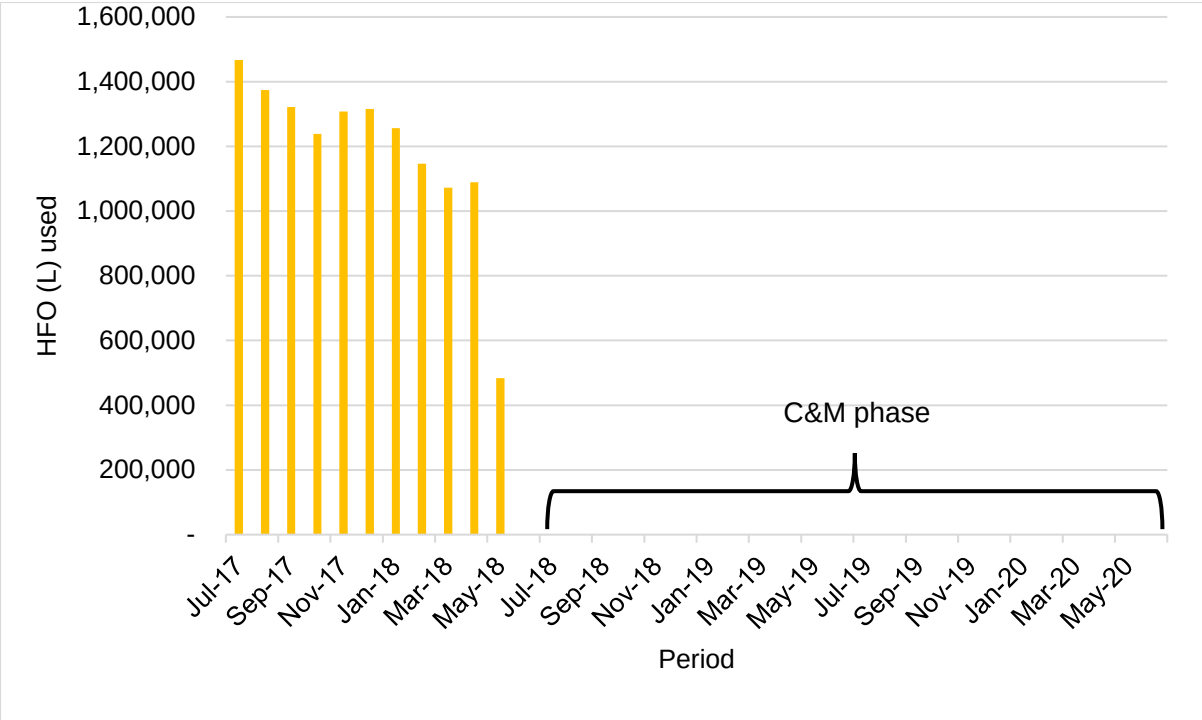


Figure 30: Monthly HFO (L) used between July 2017 and June 2020

Unleaded Petrol

The unleaded petrol is supplied by TOTAL Namibia. This is stored on-site and usage is measured via a flow meter. During the period 14,384 litres of unleaded petrol was used which equates to a calculated equivalent energy of 132,649kWh. The monthly volume of unleaded petrol (L) used is shown below (Figure 31).

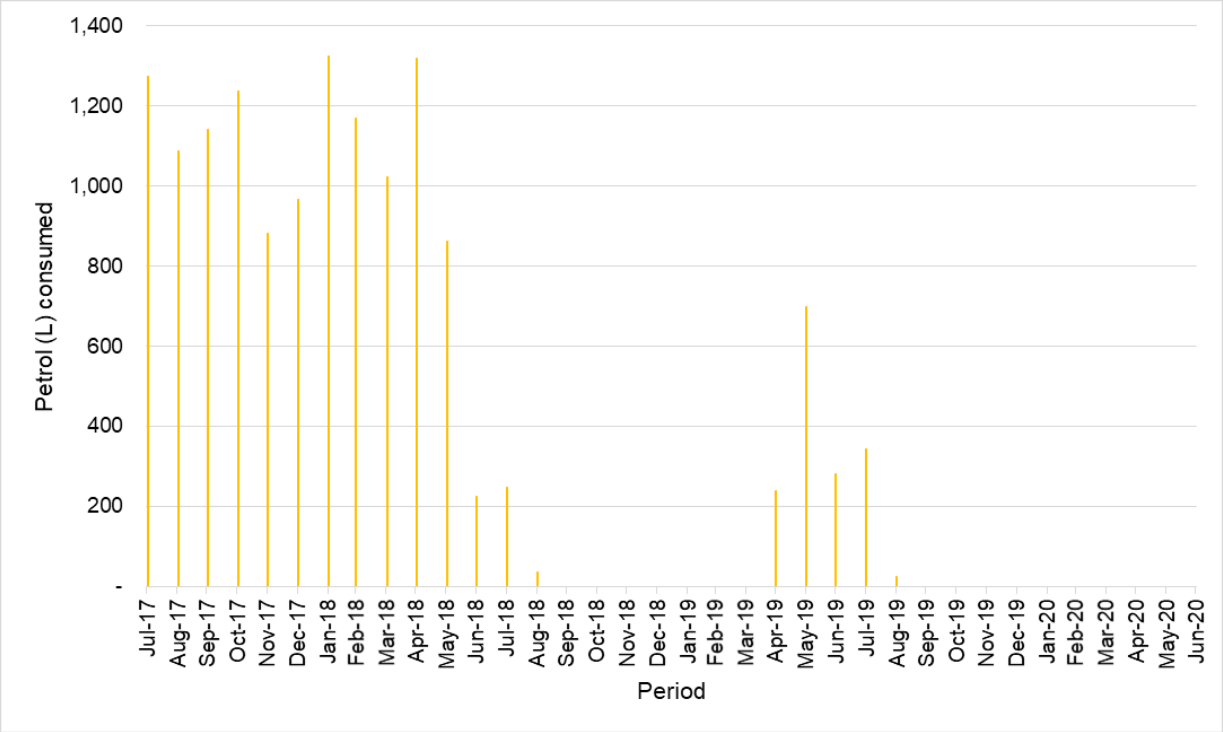


Figure 31: Monthly unleaded petrol consumed between 01 July 2017 and 30 June 2020.

Diesel

Diesel is supplied by TOTAL Namibia stored on site and usage is measured via a flow meter. During the reporting period 38,933,082 litres of diesel was used which equates to a calculated equivalent energy of 38,933,082kWh. The monthly diesel (L) used is shown below (Figure 32).

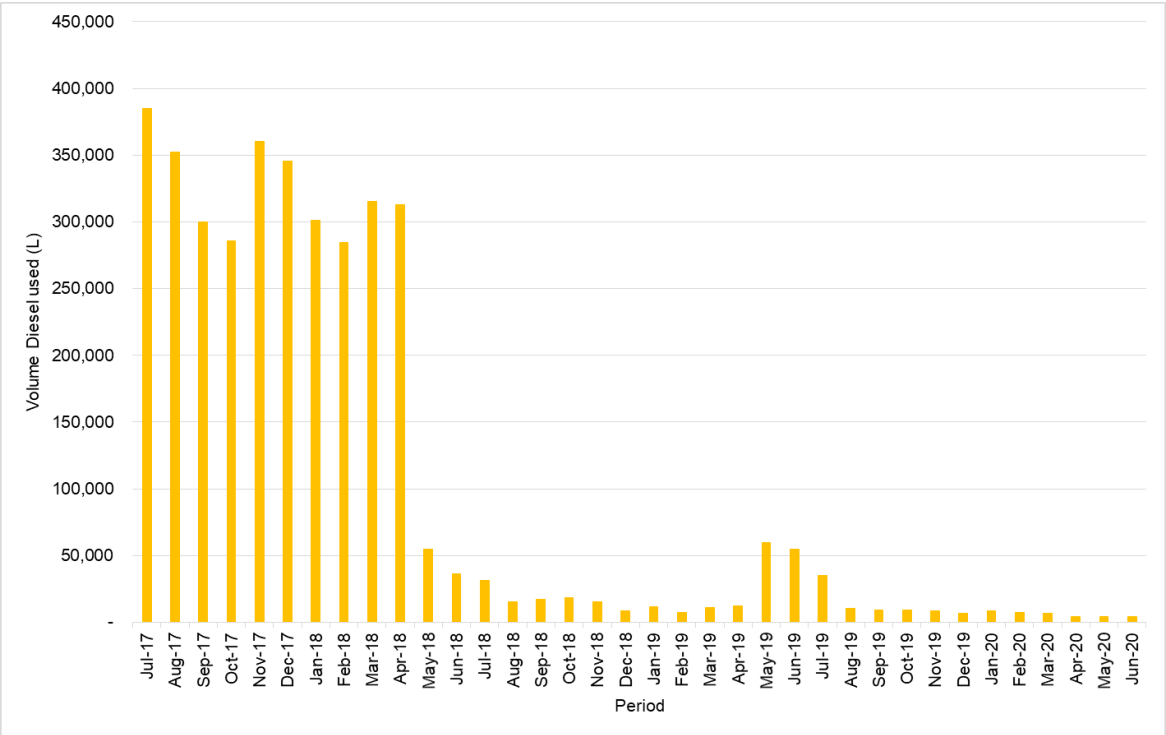


Figure 32: Monthly diesel (L) used between 01 July 2017 and 30 June 2020.

Electricity

Electricity is sourced via Erongo Red and NamPower. The power line infrastructure to LHU runs from the Kuiseb Substation in Walvis Bay to the LHU access road, from there it runs parallel with the access road to the mine site. Between 1 July 2017 and 30 June 2020 65,636,783kWh electricity was used. The monthly amount of electricity (kWh) used is shown below (Figure 33).

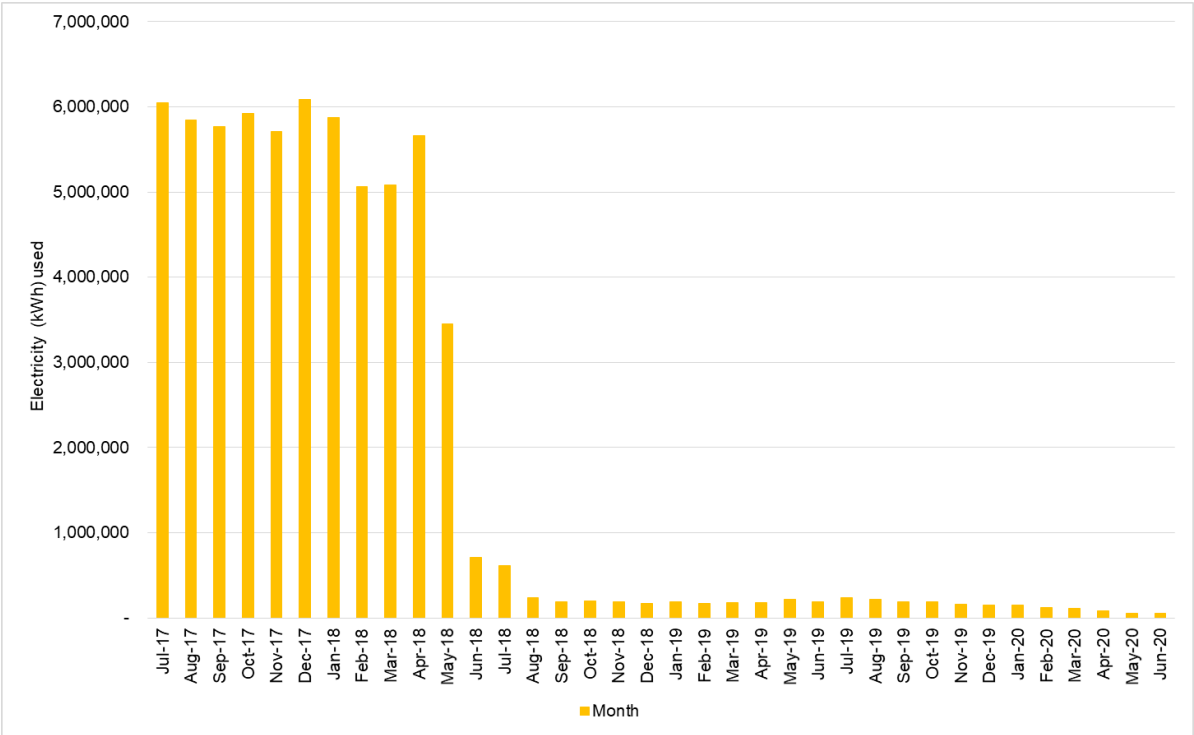


Figure 33: Monthly electricity (kWh) used between 01 July 2017 and 30 June 2020.

Total Energy Consumed

For the reporting period (1 July 2017 and 30 June 2020) the total energy usage equates to a calculated equivalent energy of 261,614,577kWh. Off this energy:

- 156,912,063kWh (49.98%) was derived from HFO consumption
- 132,649kWh (0.05%) was derived from unleaded petrol consumption
- 38,933,082kWh (14.88%) was derived from diesel consumption and
- 65,636,783kWh (25.09%) was derived from electricity used.

The monthly energy (kWh) used between 01 July and 30 June 2020 is shown below (Figure 34).

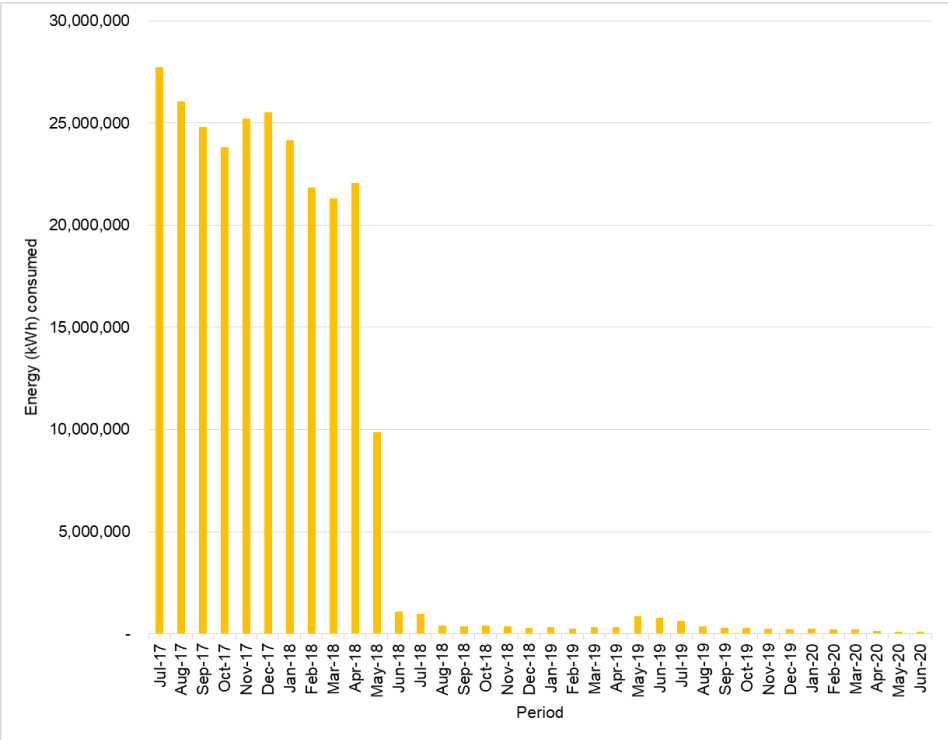
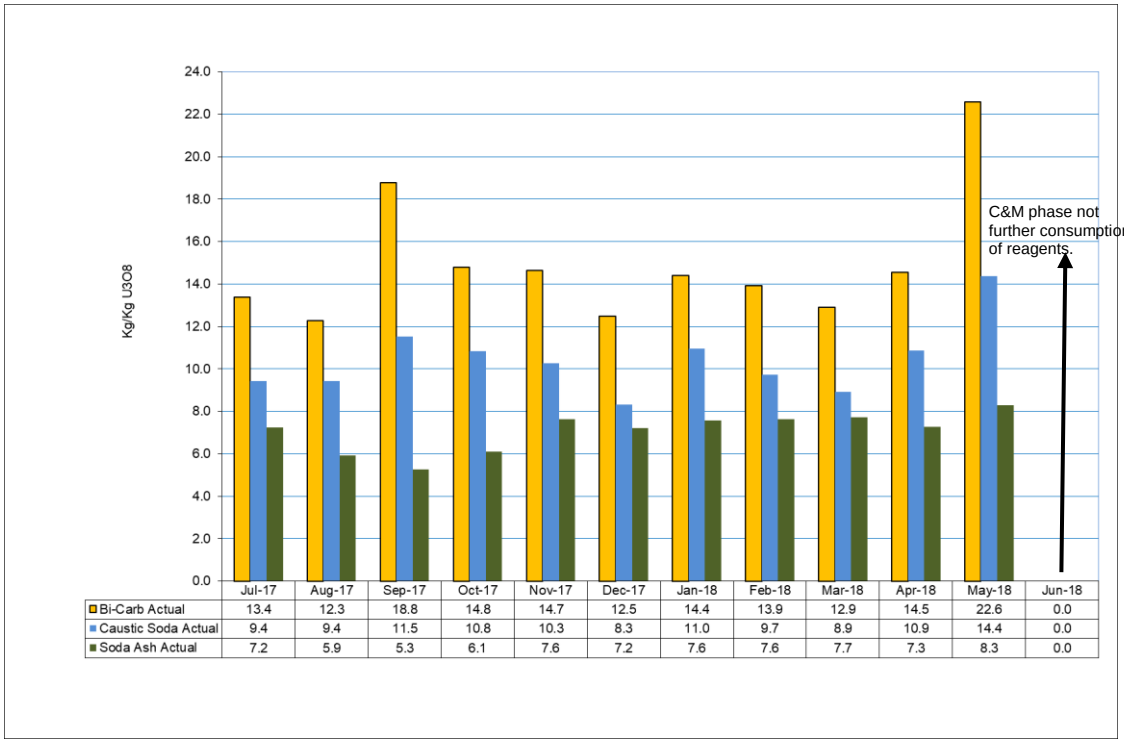


Figure 34: Monthly energy (kWh) used between 01 July 2017 and 30 June 2020.

<u>Use of manufactured material</u>

The objective of this management measure is to monitor the use of manufactured materials to ensure efficient usage. The main manufactured resources at LHM are the chemicals or reagents used in the metallurgical processing plant. The consumption is continuously monitored through a SCADA-system since inefficiencies will not only result in upset conditions inside the plant which may potentially result in plant stoppages but a higher production cost. LHU is constantly seeking ways to improve its operational efficiencies. In the process plant sodium bicarbonate in the elution columns at NIMCIX is used to strip uranium that was loaded on to resin during the adsorption stage. Unused bicarbonate forms part of a concentrated eluate and is recovered and recycled for reuse replacing the consumption of fresh bicarbonate which is a costly reagent.

Reagents consumption ceased when the mine was place in care and maintenance in April 2018 when the mine operation was prepared to go into care and maintenance. The amount (kg) of reagents consumed during this reporting period is provided below (Figure 35).



	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18
Bi-Carb Actual	13.4	12.3	18.8	14.8	14.7	12.5	14.4	13.9	12.9	14.5	22.6	0.0
Caustic Soda Actual	9.4	9.4	11.5	10.8	10.3	8.3	11.0	9.7	8.9	10.9	14.4	0.0
Soda Ash Actual	7.2	5.9	5.3	6.1	7.6	7.2	7.6	7.6	7.7	7.3	8.3	0.0

Figure 35: Amount of reagents consumed between 01 July 2017 and June 2018.

B.6.2.8. Air Quality Monitoring and Mitigation Program

Air Quality is managed through a formal Air Quality Management and Mitigation Plan. LHU remains committed to avoid, prevent and mitigate adverse impacts to air quality generated as a result of operational activities. Feedback on key deliverables and activities for the reporting period is provided below.

Meteorological Recording and Reporting

LHU continue to measure on-site meteorological conditions and LHU owns and operates its two weather stations (Davis and Gill). The recorded meteorological (temperature, evaporation and rainfall) information is discussed below, whilst rainfall information is presented above (Figure 14).

Temperature

The recorded minimum and maximum temperature between July 2017 and June 2020 is shown below (Figure 36).

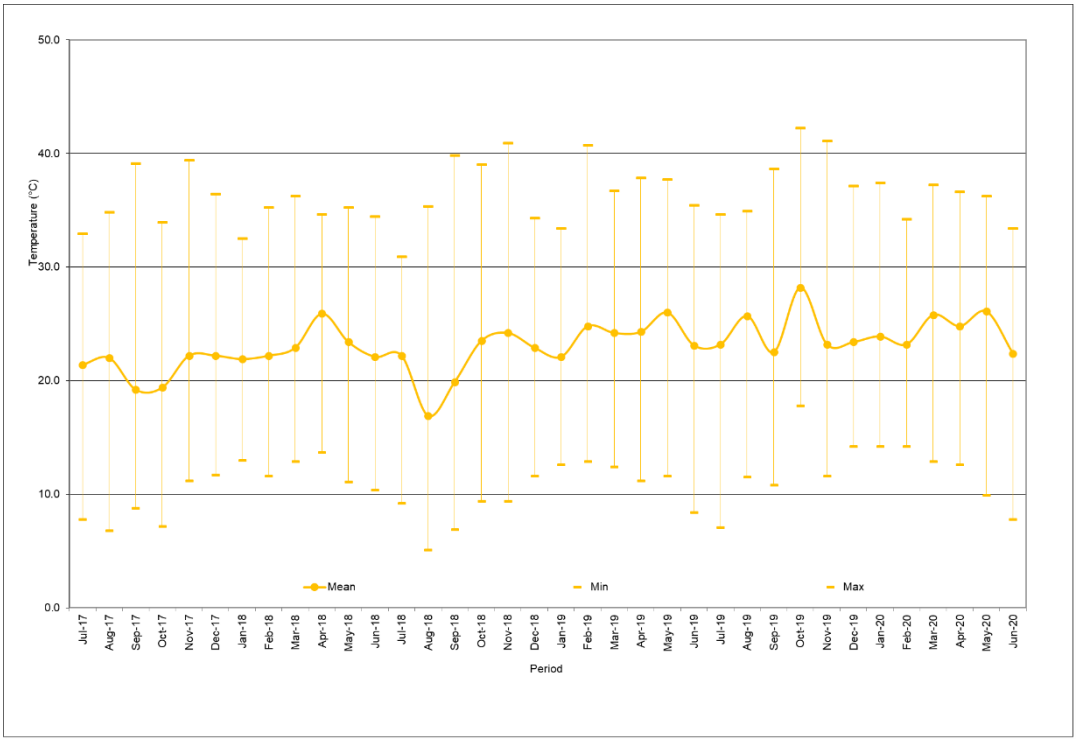


Figure 36: Maximum, Mean and Minimum Temperature (°C) for the period July 2017 to June 2020.

Rainfall

Rainfall is recorded on site by an automated weather station. The monthly and cumulative rainfall figures is shown on Figure 14.

Air emission management

Total Suspended Dust Particles (TSP) - Passive

For this reporting the following measures continued to be enforced:

- Vehicle speed monitored to ensure speed limits are being adhered to.
- Vehicles usage on the access and internal roads reduced both in numbers and movement on the roads.

Total suspended (passive) dust fallout were monitored quarterly at nine (9) sampling points across the site since the LHM's activities associated with the generation of dust were limited. LHU will re-commence with the monthly TSP dust monitoring once LHM is back in operation. The monitoring results indicated that the dust dispersion rate is within the minimum industrial limit of 1,200 mg/m^2/day. Only the CCD Valley South-site indicated levels exceeding this standard. This exceedance is not reportable. The recorded information is provided below (Figure 37).

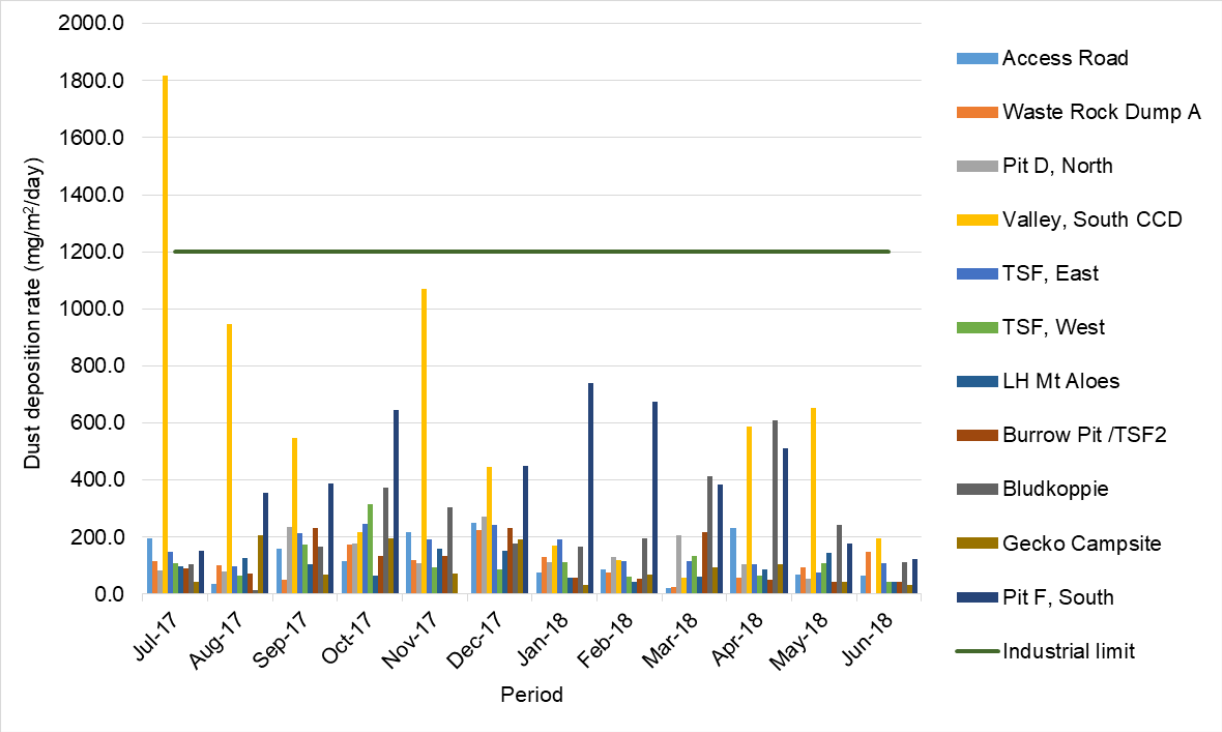


Figure 37: Single bucket dust deposition rates (mg/m^2/day) between July 2017 and June 2018.

Total suspended (passive) dust fallout were monitored quarterly at nine (9) sampling points across the site since the LHM's activities associated with the generation of dust were limited. LHU will re-commence with the monthly TSP dust monitoring once LHM is back in operation. The monitoring results indicated that the dust dispersion rate is within the minimum industrial limit of 1,200 mg/m^2/day. The recorded exceedance were as a result of the PFS activities conducted during this period. The recorded information is provided below (Figure 38).

Further monitoring of TSD (passive dust fallout) was suspended (commencing 1 January 2020) until LHM is back in operation.

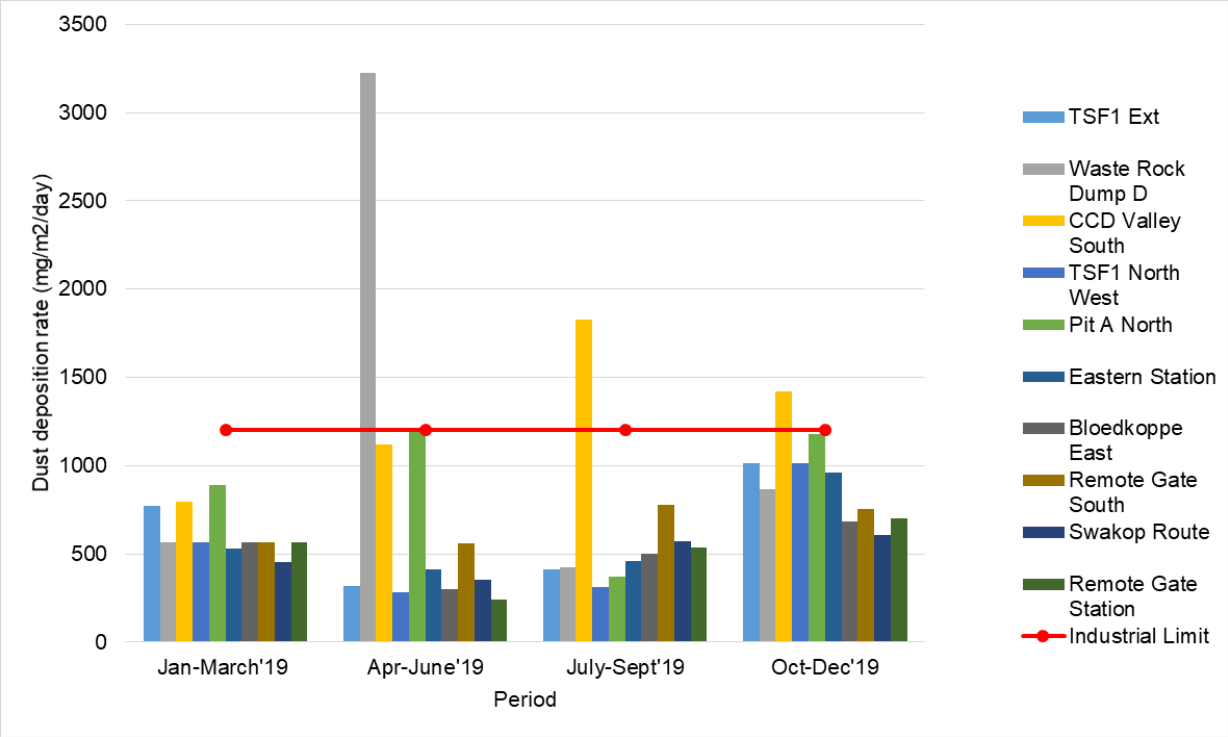


Figure 38: Single bucket dust deposition rates (mg/m2/day) between January and December 2020.

Particle Matter (PM10)

Langer Heinrich Uranium uses high volume dust samplers fitted with PM10 heads to monitor dust levels in the environment. Samples are collected over a seven day period. There are three samplers placed around the site with the one used for critical group assessments situated at the Remote Gate located on the Western side to the mine. The calculated averaged of the PM10 concentrations was 32µg/m³ which is below the WHO-IT-2 interim guideline of 50µg/m³ for annual mean concentrations.

Anemometer data for the entrance gate indicates that the wind blows from the mineralised section of the mine for less than 20.3% of the year.

The Annual Radiation Reports were compiled and delivered to the National Radiation Protection Authority (NRPA) of Namibia. Detailed information on the methodology, results and reporting on results obtained in available in the annual Radiation Monitoring report that is submitted to the NRPA. These documents (2017, 2018 and 2019) are all available on request.

Gaseous emissions

The air quality study of LHM found this aspect to have minimal impact. Two point sources were identified namely; the HFO boilers and the diesel generators.

HFO Boilers

Whilst in operation LHU operated two HFO boilers at any given time with a third Boiler on-standby. During the air quality review conducted by external specialist it was confirmed that the measurement taken at the boiler stacks show compliance with World Bank Group (WBG) emission limits for nitrogen and sulphur dioxide.

Diesel Generators

The diesel generators have been operated and maintained according to supplier specification. The units are started once per week to ensure reliability or when NamPower is off grid.

Greenhouse gas emissions:

LHU report on an annual basis the GHG-emissions in accordance with the Global Reporting Initiative. Some progress has been made in terms of Energy Efficiency. Investigations were made into sourcing "greener" energy supplies but the implementation did not happen occur due to current economic constraints. LHU remains committed to effectively managing and reducing its environmental impacts as far as practicable possible. The efficient use of energy is central to reducing greenhouse gas emissions, as well as reducing the cost to LHU associated with fuel and other energy uses.

Energy usage at LHM was significantly lower than for the previous reporting periods, due to the LHM being placed onto Care and Maintenance. This resulted in lower greenhouse gas (GHG) emissions at LHM in terms of CO_2 equivalent for Scope 1 direct site-generated GHG emissions and also for Scope 2 indirect GHG emissions from purchased electricity. Total direct and indirect greenhouse gas emissions at LHM is shown below (Table 16).

Table 16: Total direct and indirect Greenhouse Gas (GHG) emissions at LHM

Type of GHG emissions	Source of GHG emissions	LHM (tCO_2 equivalent)		
		Jul'17 – June'18	Jul'18 – June'19	Jul'19 – June'20
Scope 1 direct site-generated GHG emissions	Diesel (Power)	45	22	-
	Diesel (Heat Generation)	-	-	-
	Diesel (Bore field Generators)	302	-	-
	Automotive Diesel	8,776	666	308
	Automotive Petrol	29	3	1
	Heavy Fuel Oil (Heating)	36,729	-	-
	Emulsion	-	-	-
	Total Direct Emissions	45,881	692	309
Scope 2 direct site-generated GHG emissions	Total Indirect Emissions (Public Electricity)	59,575	2,637	1,659
Total (Scope 1 and Scope 2) GHG emissions		**105,456**	**3,328**	**1,968**

The percentage direct and indirect GHG emissions between July 2017 and June 2020 is presented below (Table 17).

Table 17: Percentage contribution per Scope Type between 01 July 2017 and 30 June 2020.

Percentage contribution per Scope Type	Jul'17 – June'18	Jul'18 – June'19	Jul'19 – June'20
Scope 1: Total Direct Emissions	43.51%	20.78%	15.70%
Scope 2: Total Indirect Emissions	56.49%	79.22%	84.30%

B.6.2.9. Soil MMP

Feedback on key deliverables and activities for the reporting period is provided below:

- Standard Operating Procedures accompanied with Work Instructions where required were implemented to ensure activities that may result in soil pollution are mitigated as far as practicable.
- Employees whose activities may result in soil pollution received the required training.
- LHU do have a Land Clearance Procedure in place that will be activated in the event of any site clearance require. No new land was disturbed during this reporting period. No soil were stockpiled, hence no new stockpiling areas were developed.
- The Care and Maintenance program has resulted in a significant reduction of vehicle movement, both in and around the site as well as off –site.
- Rainfall was low and no storm water run-off was recorded.
- There were no spills reported that required the evoking of LHU Emergency Spill Response Procedure.
- There were no environmental spills that required reporting to the Authorities.

B.6.2.10. Visual MMP

Feedback on key deliverables and activities for the reporting period is provided below:

- No new land was disturbed during this reporting period nor were there any new activities introduced that created new visual impacts.
- All visitors and employees (LHU appointed employees and contractors) received general induction where as a minimum the NNNP rules are presented and discussed.
- All employees (LHU appointed employees and contractors) receive relevant risk base training. Housekeeping Inspections are conducting at least monthly which include any issue pertaining to littering.
- There were no external complaints raised pertaining to visual impacts resulting from LHU activities or infrastructure.

B.6.2.11. Solid Waste Monitoring and Mitigation Plan

At LHU, waste is generated during the different phases of the operations. The overall objective of the LHM waste management and mitigation management plan is to minimize waste generation and ensure proper storage, removal, transportation and disposal of waste. This waste is categorised into two key categories Mineralised Waste and Non-Mineral Waste:

Mineralised Waste. Feedback on key deliverables and activities for this reporting period is provided below.

<u>Mineralised Waste Management</u>

This type of waste is generated at the start of mining also referred to as non-process waste (Low-grade ore material and Waste rock) during the metallurgical process (Tailings Material and Barren Material). This constitutes all mineral material less than or equal to 250 ppm that cannot be processed further either because of constraints related to current metallurgical technology and processes or due to the current commodity price or as a combination of both. No Mineralised Waste leaves the LHU-site but can be re-used as backfilled material in the TSF's, less than 100 ppm for construction purposes such as the construction of haul roads.

Standard Operational Procedures describe the waste disposal methodology. The application of these Standard Operating Procedures is verified through inspections and audits.

The mineralised waste is further categorised into mined mineralised waste rock and processed mineralised waste.

Mined mineralised waste rock

There was no mined mineralised waste rock and processed mineralised waste) generated for this reporting period.

Processed mineralised waste material

Processed mineralised waste consists of ore rejects, which is all mineralised material that is too low in grade to be treated (also referred to as barrens) and tailings material which is the remaining material after recoverable uranium has been extracted. The amount (tonnes) of Processed mineralised waste material (barrens and tailings material) generated during this reporting period is provided below (Figure 39).

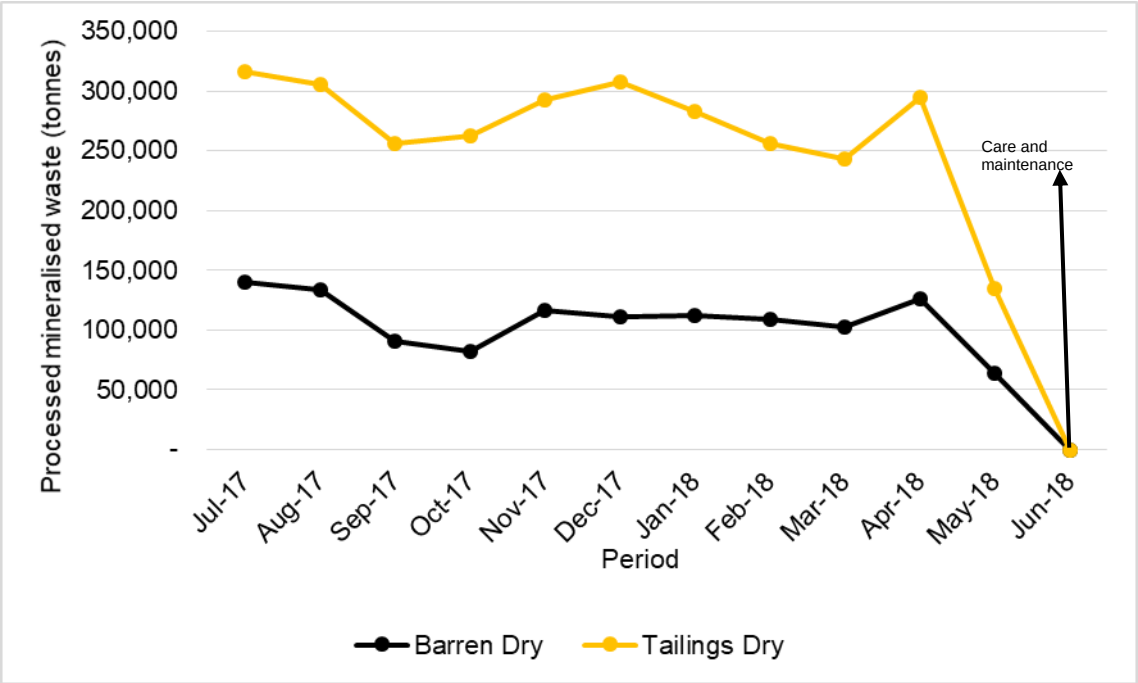


Figure 39: Processed mineralised waste (tonnes) generated between July 2017 and June 2018.

Non Mineral Waste Management

This type of waste includes all waste that is non-mineralised waste (see definition above). The non-mineralised waste is further categorised into non-mineralised low – level radioactive contaminated waste and non-mineralised non-radioactive contaminated waste. All non-mineralised waste is scanned for radioactive contamination prior to the waste being removed off-site. Only waste with a surface contamination of less than 4 Bq/cm^2 over an area of 300 cm^2 is allowed to leave the LHU-site. The non-mineralised waste which exceeds this level is kept on-site and disposed in a dedicated waste storage facility. The radiation clearance for site removal of waste is done through the Radiation Management Section under the management of the appointed Radiation Safety Officer (RSO). Operational Procedures and

Work Instructions describe this waste management process, and records of the coordinates and the amount of waste disposed of are documented. Appropriate radiation and environmental training and induction is provided to all employees and visitors to the LHU-site. The implementation and application of these Operating Procedures and Work Instructions are verified through inspections and audits.

The non-mineralised non-radio-active waste (all waste that is radio-actively cleared to be disposed off-site) is further classified into; non-mineralised non-radioactive hazardous and non-hazardous waste. Operational Procedures and Work Instructions describe this waste management process, and records of the coordinates and the amount of waste disposed are documented. Appropriate radiation and environmental training and induction is provided to all employees and visitors to the LHU-site. The implementation and application of these Operating Procedures and Work Instructions are verified through inspections and audits.

The non-mineral waste management onsite was contracted to a local company Rent-A-Drum since August 2016. The contractor has approvals to dispose waste at Walvis Bay, as well the Walvis Bay Municipality Hazardous waste facility. A safe disposal certificate is issued for the waste disposed at hazardous waste facility. The contractor collect waste from the source, sort it and then transport it offsite for disposal and recycle. The medical waste is transported to Medi-Clinic in Swakopmund for incineration. The low level radio – active contaminated waste is transported and stored at designated waste site onsite. All waste volumes are documented and reported in both internal and external reports.

The non-mineralised water type and amount (kg) of non-mineral solid waste generated during this reporting period is presented below (Table18).

Table 18: Non-Mineral solid waste generated during this period.

Period	Non-Mineral Solid Waste (kg)						
	General waste	Recyclables-Other	Recyclables-Metal	Hazardous waste (solid)	Low level radio-active contaminated waste	Medical Waste	Total per month (kg)
Jul-17	12,332	5,255	-	287	32,020	17	49,911
Aug-17	21,390	4,591	36,060	-	39,407	-	101,448
Sep-17	8,292	1,750	20,720	4,690	18,434	-	53,886
Oct-17	6,280	2,493	56,220	4,270	21,360	-	90,623
Nov-17	9,330	3,546	8,140	4,720	27,160	-	52,896
Dec-17	4,170	2,284	13,860	150	17,460	-	37,924
Jan-18	12,980	1,523	-	2,680	13,820	-	31,003
Feb-18	14,942	1,779	11,760	360	34,510	-	63,351
Mar-18	13,226	2,325	-	8,030	35,820	-	59,401
Apr-18	9,350	1,562	2,780	4,850	27,120	-	45,662
May-18	5,020	1,424	-	2,580	16,662	-	25,686
Jun-18	4,540	4,237	-	1,720	130,760	-	141,257
Jul-18	1,900	4,009	-	-	20,352	-	26,261
Aug-18	800	1,517	-	-	26,600	-	28,917
Sep-18	800	1,280	-	-	2,200	-	4,280
Oct-18	-	-	100,620	74,676	-	20	175,316
Nov-18	1,440	-	83,880	406,325	1,460	-	493,105

Period	Non-Mineral Solid Waste (kg)						
	General waste	Recyclables-Other	Recyclables-Metal	Hazardous waste (solid)	Low level radio-active contaminated waste	Medical Waste	Total per month (kg)
Dec-18	-	-	25,000	-	-	-	25,000
Jan-19	680	-	31,230	-	1,500	-	33,410
Feb-19	700	-	-	-	-	-	700
Mar-19	580	-	-	-	1,220	-	1,800
Apr-19	600	-	-	-	2,680	-	3,280
May-19	260	-	-	-	-	-	260
Jun-19	640	-	-	1,240	2,020	20	3,920
Jul-19	320	-	-	-	960	-	1,280
Aug-19	290	-	-	-	-	-	290
Sep-19	-	-	-	-	-	-	-
Oct-19	420	-	-	-	-	-	420
Nov-19	640	-	-	-	1,940	-	2,580
Dec-19	100	-	-	-	3,600	-	3,700
Jan-20	-	-	-	-	-	-	-
Feb-20	560	-	-	-	-	-	560
Mar-20	-	-	-	-	-	-	-
Apr-20	-	-	-	-	-	-	-
May-20	800	-	-	-	-	-	800
Jun-20	-	-	-	-	-	-	-
Total	**133,382**	**39,575**	**390,270**	**516,578**	**479,065**	**57**	**1,558,927**

The calculated total non-mineralized solid waste for this reporting period came to 1,558,927kg comprised of:

- 133,382kg (8.56%) weight in general waste removed by Rent-A-Drum for final disposal at the Swakopmund Municipal Landfill site.
- 39,575kg (2.54%) weight in recycle waste removed by Rent-A-Drum for recycling at their Recycling facility in Swakopmund.
- 390,270kg (25.03%) weight in recyclable metal removed by a KMCC and a Scrap metal dealer.
- 516,578kg (33.14%) weight in hazardous solid waste that comprised mostly of tyres removed by KMCC during site demobilisation.
- 479,065kg (30.73%) weight in low level radio-active contaminated waste that was disposed at the on-site facility.
- 57kg (0.004%) weight in medical waste for incineration to Cottage Medi-Clinic located in Swakopmund.

The percentage non-mineralised waste by type generated during this period is presented below (Figure 40).

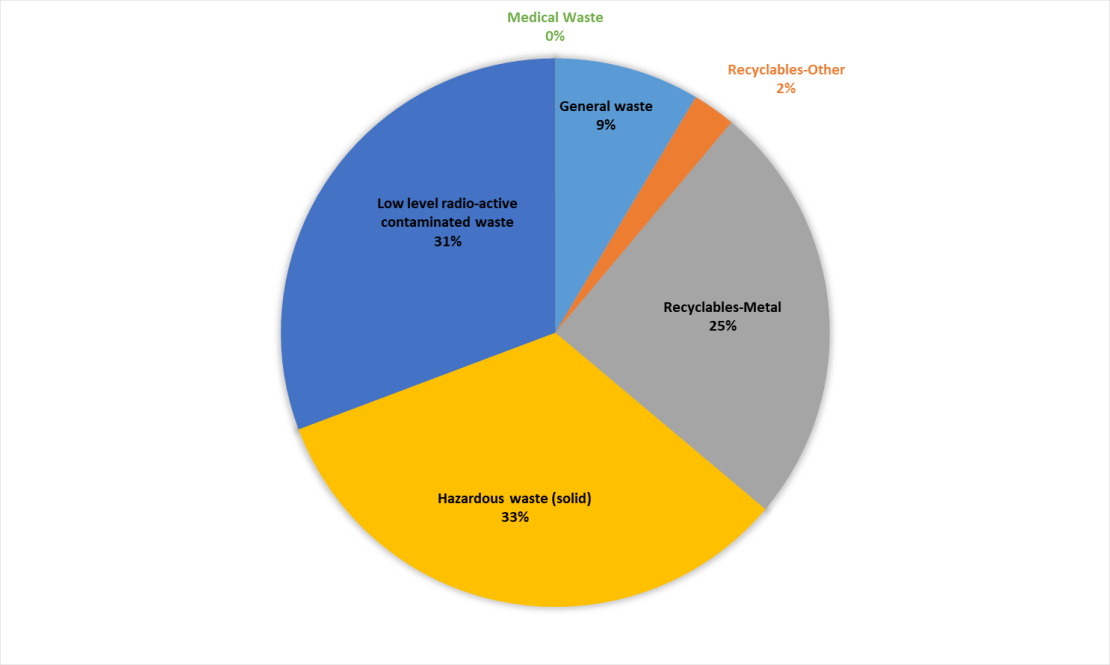


Figure 40: Percentage non-mineralised waste generated for the period 1 July 2017 - 30 June 2020

Awareness and Training

- LHU does have a solid waste management procedure which described the storage, handling and transportation of waste.
- All LHU and contractor employees received general waste management training.
- Awareness pertaining to waste management is further covered during risk based training where the waste management relevant to each job is discussed in detail.

B.6.2.12. Noise and Vibration MMP

During this period noise and vibration impacts resulting from LHM activities were insignificant because:

- No Swakop River Groundwater abstraction occurred during this reporting, thus the generator was inoperative.
- No blasting activities took place during this reporting period.

LHU remains committed to adhere to all relevant legal and other requirements pertaining noise pollution and vibration impacts.

B.6.2.13. Socio-Economic MMP

The core objective of this plan is to enhance positive impacts and limit negative socio-economic impacts of LHU on the identified communities. The management commitments on Socio-Economic Management are related to general stakeholder consultation and communication, which is managed through a formal Social Performance Management Plan. This plan follows the International Standards Organisation (ISO) Standards 14001 and 26000. The continuing challenging economic environment with the low uranium market price has made it difficult to consistently maintain sufficient resources to progress social and community

programmes as planned. Feedback on key deliverables and activities for the reporting period is provided below.

Employment creation

Diversity and Equal Opportunity

Given the care and maintenance status of the LHM operations and limited number of on-site staff (13 as at June 2020) LHU was as relevant Employer exempted from the equal employment reporting requirements as provided for in the Affirmative Action (Employment) Act 1998 and the exemption confirmed by the Employment Equity Commission. It is also to be noted that as at June 2020 the LHU workforce consisted of Namibians only.

Workforce

Against the background of the continued depressed uranium price environment and longer term constrained economic outlook the LHU Board resolved to implement a Care and Maintenance Strategy (C&M) at LHM during 2018. The C&M implementation required the optimising of holding costs and the focussed preservation of assets resulting in collective retrenchments commencing June 2018 and retaining only a limited number of C&M staff. The office of the Labour Commissioner issued LHU a compliance certificate as to due legal processes followed. The retrenchments during the financial year end June 2020 resulted in an overall 12 month rolling total turnover of 32% in comparison to 88% in the previous reporting period. This information is presented in Table 19 below.

Table 19: LHU workforce

Reporting Period	Number Of Employees
July 2017 - June 2018	165
July 2018 - June 2019	19
July 2017 - June 2020	13

Education and Training

July 2017 – June 2018:

The challenging financial constraints mentioned resulted in limiting human resources talent and skills capability development other than statutory and/or specific technical training interventions. Notwithstanding, LHU contributed to the Namibian Vocational Education & Training Levy, N$70,556.00 in the training of 16 Namibians, supporting, 7 Graduate students in the fields of Metallurgy, Chemical Engineering, Environment and Radiation and 11 Artisan Apprentices in Electrical, Fitting & Turning and Boilermaker Trades. Technical job attachments were made possible at LHM to technical trainees from the Namibia Institute of Mining and Technology (NIMT) and the Namibia Training Authority (NTA).

July 2018 – June 2019:

The challenging financial constraints mentioned resulted in limiting human resources talent and skills capability development other than statutory and/or specific technical training interventions. Notwithstanding, LHU contributed to the Namibian Vocational Education & Training Levy, N$230,548.78 in the training of Namibians.

July 2019 – June 2020

Human resources talent and skills capability development was constraint to statutory and/or specific technical training interventions. LHU contributed to the Namibian Vocational Education & Training Levy, N$34,285.00 in the training of Namibians.

Community Support

LHM's social responsibility programme focuses on the key areas most relevant to Namibia's national needs and LHM's sphere of influence. LHU's social responsibility programmes are based on social management plans developed in response to social impact assessments (conducted as part of the public environmental impact assessments) undertaken for both the project development and the expansion phases at LHM. Elements of the programme included feeding schemes, educational development, ecological improvement work in the NNNP and regional economic development, with the aim of providing cost effective and measureable benefits to communities in Namibia. Ongoing community needs are also considered when developing social and community programmes. The overall social impact of LHM on the broad community, both direct and indirect, is considered to be positive. LHU's social responsibility programmes have been significantly reduced since LHM was place on care and maintenance as is evident from the information provided below:

1 July 2017 – 30 June 2018

The initiatives, undertaken during the reporting period summarised below, focused on education, health, sport and youth development, environmental projects and feeding programmes.

Educational Initiatives

- A principal sponsor with a further five year agreement made in April 2015 to support the Mondesa Youth Opportunities (MYO) organisation. MYO provides educational assistance in the areas of English, mathematics and computer skills to students drawn from the disadvantaged areas around Swakopmund.
- Providing support to the Namibia's 13th National Mathematics Congress with a donation of N$50,000. The purpose of the Congress is to improve the standard of mathematics education across Namibia by upgrading the knowledge and skills of teachers and students.
- Sponsoring N$121,400 for students to attend the Mathematics Support and Enrichment Programme which focuses on the development of mathematical process skills for secondary students.

Environmental Programmes

- Sponsorship of N$1.2M to the Gobabeb Research and Training Centre over a 5 year period. The funds assisted the Centre in running its internship Programme to train 20 environmental students over a five year period. The students were tasked with designing and implementing original, independent research projects that focused on the management and restoration of degraded ecosystems.
- Continuation a five year training internship programme, which commenced in 2015, for four Namibian environmental graduates for the Namib Ecological Restoration and Monitoring Unit (NERMU).

Other Community Initiatives:

- Through funds raised during its Annual Charity Golf events, LHU has supported various children-centred projects over the last seven years. During the reporting period, N$1M was raised for the construction of classrooms at the Etoto West Primary School Unit in the Kunene region.

- In addition, N$55 000 was donated towards the successful hosting of the following events:
  - The Annual Erongo Regional Teachers Awards,
  - Prize giving events of all schools in the Erongo region and,
  - A career exhibition.
- Sponsorship of the Blue Waters Sports Club youth development programme to provide equipment, transport and financial backing to young potential sports stars particularly for cricket and football (soccer). During the financial year, N$150,000 was invested in this programme.
- LHU has been supporting the Promiseland Trust Feeding Scheme for the past eight years. The Scheme caters for 250 disadvantaged children in Walvis Bay on a daily basis. The Promiseland Trust also has a foster child programme and has recently included pre-school classes using the Montessori Education Model in its activities. LHU donated N$180,000 towards the feeding Scheme during the year under review

1 July 2018 – 30 June 2019

LHU recognises its social responsibility and has a commitment to supporting activities which benefit the coastal community and the development of Namibia in line with Namibia's Millennium Development Goal. The initiatives, undertaken during the reporting period summarised below, focused on education, health, sport and youth development, environmental projects and feeding programmes.

Chamber of Mines joint CSR Projects

During the 2019 financial year LHU pledged N$117,375 towards 2 Chamber of Mines joint initiatives:

- The electrification of 900 homesteads in the Zambezi region.
- Servicing of about 150 plots of land for ownership by low-income families in the Oshana Region.

Namibian Drought Relief Initiative

- Poor rainfall during the 2018/2019 Namibian rain season has led to one of the worst droughts in recent history. In an effort to assist local farmers and communities LHU has contributed N$100,000 toward the Chamber of Mines drought relief program.

Education Initiatives

- Through funds raised during its Annual Charity Golf events, LHU has supported various children-centred projects over the last seven years. During the previous reporting period, N$1M was raised for the construction of classrooms at the Etoto West Primary School Unit in the Kunene region. Between 1 July 2018 and 30 June 2020 LHU contributed an additional amount of N$190,442. The classrooms were handed over at an official ceremony in February 2019.
- In addition, N$15 000 was donated towards the successful hosting of the following events: the Annual Erongo Regional Teachers Awards, prize giving events of all schools in the Erongo region and a career exhibition.

1 July 2019 – 30 June 2020

During this period, LHU donated N$1,000.00 to Pro-Ed Academy for their annual Grade 12 prize giving.

Sourcing of goods and services

LHU positively contributes to its communities by creating opportunities for local businesses to provide goods and/or services to the mine. LHM's overall expenditure was lower than the previous year due to successful transition into care and maintenance, a focus on reduction in operational cost and the depreciation in the Namibian dollar. This information is shown below (Table 20).

Table 20: Expenditure on Goods, Materials and Services (US$)

Area	Jul'17 –June'18	Jul'18 –June'19	Jul'19 –June'20
Local and Regional	46,118,658	2,792,820	1,404,942
National	23,169,345	4,177,456	2,039,542
International	2,556,941	1,845,537	2,687,082
Total	71,844,944	8,815,813	6,131,566

Payments to Republic of Namibia

LHU's contributions towards the economy of Namibia (through various tax payments) during the reporting periods are presented below (Figures 34 to 36)

1 July 2017 – 30 June 2018

Between 01 July 2017 and 30 June 2018 LHU contributed to the Government of the Republic of Namibia to a total value of N$ 281,506,734.00. Further information is provided below (Figure 41).

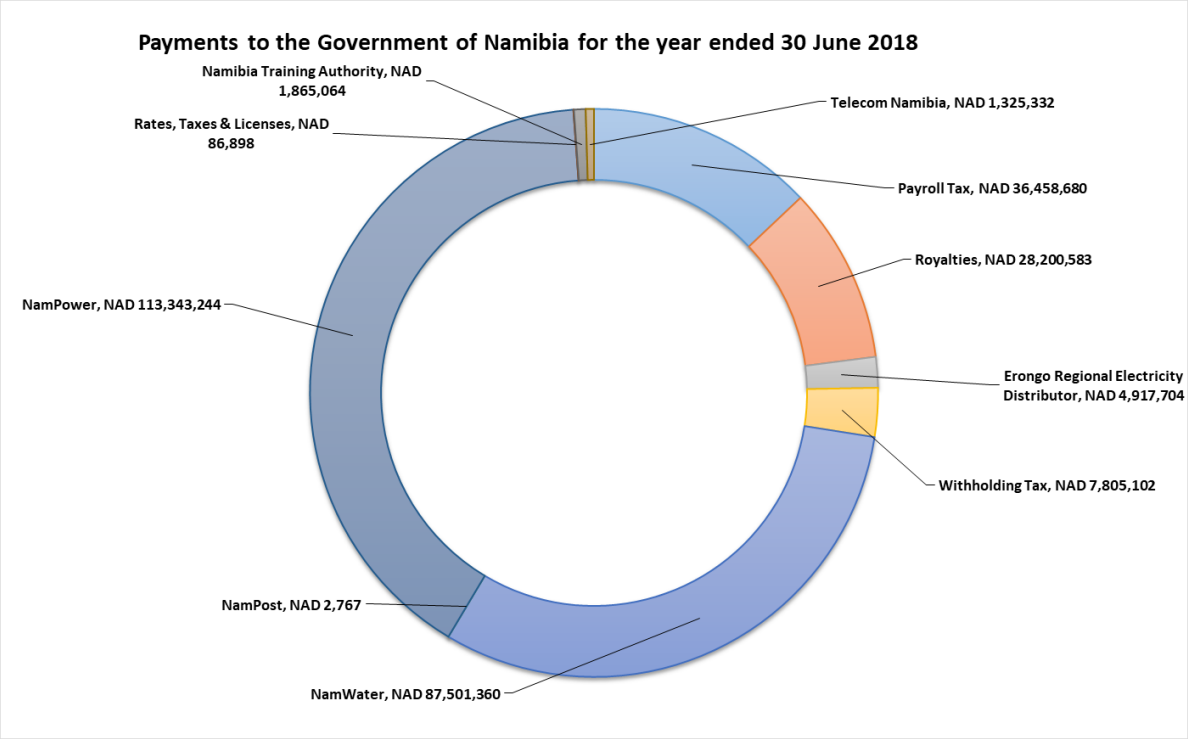


Figure 41: Payments to the Namibian Government for the year ended 30 June 2018

1 July 2018 – 30 June 2019

Between 01 July 2018 and 30 June 2019 LHU contributed to the Government of the Republic of Namibia to a total value of N$ 78,593,847.00. Further information is provided below (Figure 42).

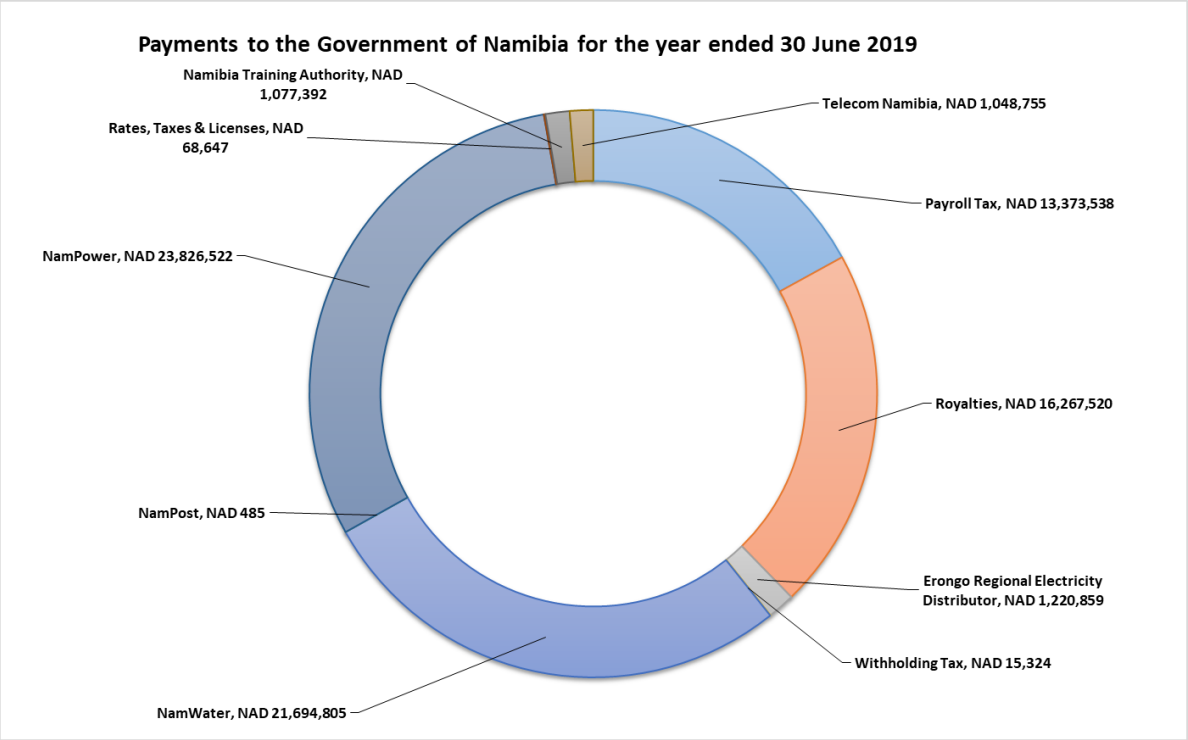


Figure 42: Payments to the Namibian Government for the year ended 30 June 2019

1 July 2019 – 30 June 2020

Between 01 July 2018 and 30 June 2019 LHU contributed to the Government of the Republic of Namibia to a total value of N$ 13,010,015.00. Further information is provided below (Figure 43).

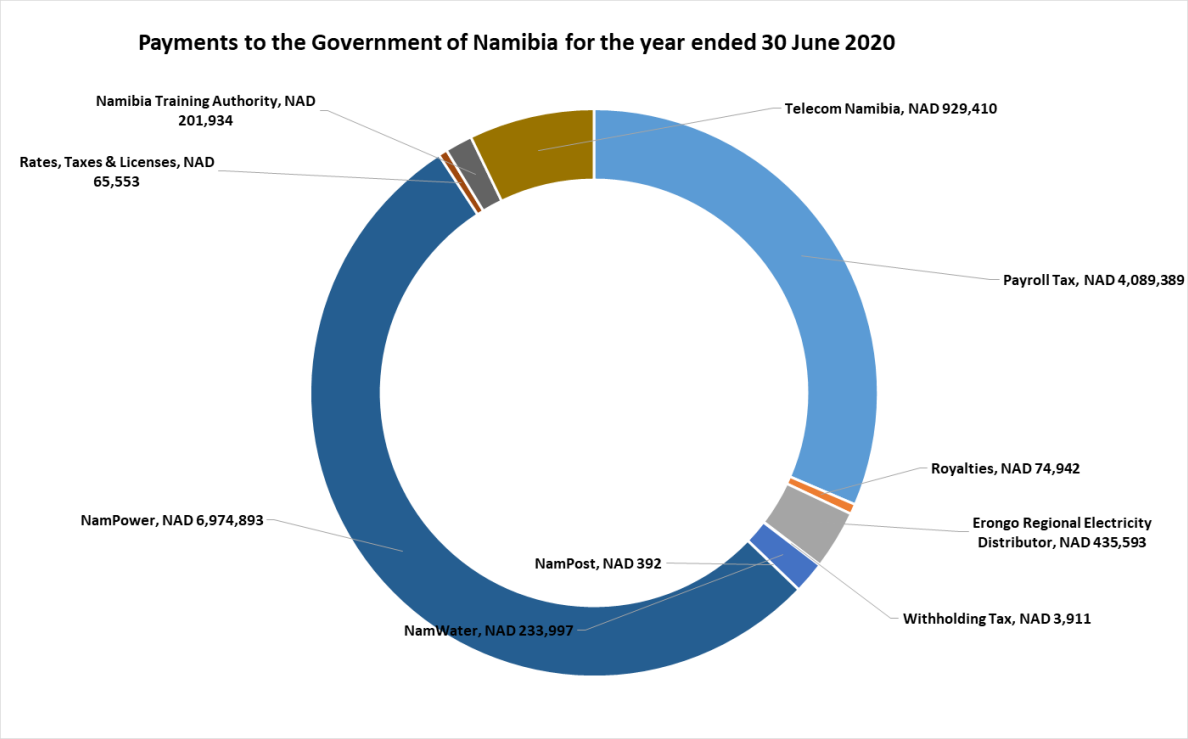


Figure 43: Payments to the Namibian Government for the year ended 30 June 2020

B.6.2.14. Radiological MMP

LHU's Radiation impacts are extensively addressed through a formal Radiation Management System. Feedback on the systems performance is provided in the form of an Annual Radiation Report as per legislative requirements. All management commitments made in the EMP are being addressed and managed through the Radiation Management System and associated report. The 2017 to 2019 Annual Radiation Report was submitted to the National Radiation Protection Agency (NRPA) and the report is available upon request.

B.6.2.15. Archaeology MMP

LHU acknowledges the archaeological sensitivity of the northern part of the Namib-Naukluft National Park where the mine is located and is committed to act with integrity, honesty and sensitivity in respect to these sites. All mining and related developments are subject to archaeological assessment and no unauthorized archaeological impacts should occur. LHU has developed and implemented an Archaeology Plan. The plan is integrated and embedded across LHM. Sites of archaeological importance have been identified and are mitigated and managed. There were no new activities undertaken which had an impact on archaeology and cultural sites.

B.6.3. Conclusion

It is to be noted that all reporting activities is to be viewed against the background of the care and maintenance (C&M) status of LHU. This status implies that activities are limited and focused to preserve the mine as an asset and to ensure the safe and proper care of LHU personnel and contractors. From the information presented LHU continues to:

- Carry out C&M activities within the framework of relevant legal and other requirements.
- Continuously seeks ways to further reduce impacts on the environment.
- Integrate environmental management across the business.
- Choose to openly and transparently report and present environmental performance.

LHU remains committed to:

- On-going improvement on Environmental Performance.
- Continue to engage and consult with its identified Stakeholders.
- Continue to openly and transparently report environmental information.
- The ongoing management and reduction of identified Safety, Health, Environmental, Radiation and Security risks to a risk level as low as is reasonably practicable.

LANGER HEINRICH URANIUM MINE
ENVIRONMENTAL MANAGEMENT PLAN

SECTION C

ENVIRONMENTAL MANAGEMENT FRAMEWORK

C. REVISED ENVIRONMENTAL MANAGEMENT PLAN

This section provides information on the revised Environmental Management Plan (EMP). The following information is discussed in this Section:

- LHU Environmental Management System (EMS) framework.
- Environmental management and mitigation programs
- Revised Environmental Management Plan

C.1. Environmental Management System Framework

Langer Heinrich Uranium (Pty) Ltd.'s (LHU) commitment to the environment is set out in its: Environmental Policy, Environmental Management Plan (EMP) and Environmental Standards.

LHU has developed its Environmental Management System (EMS) in accordance with the International Organisation of Standardisation (ISO) 14001 / South African National Standard (SANS) 14001: 2005 environmental management system requirements. LHU was ISO 14001 certified prior to the decision being made to place the LHM on care and maintenance.

Whilst no longer ISO 14001 certified, LHU continues the use of this system to prepare its EMP, since it ensures that the environmental management requirements on LHM's activities are not only properly planned for, but a robust mechanism for implementation is also ensured and, most importantly that the environmental management function is always reviewed in the spirit of continual improvement.

The standard is applicable to environmental management. LHU's environmental commitments are aligned with the fundamental commitments of the ISO standard, namely active management, meeting relevant legal requirements as a minimum standard, and achieving continual improvement in environmental performance.

The ISO14001 approach is based on a cycle of continual improvement, as shown in the diagram below (Figure 44).

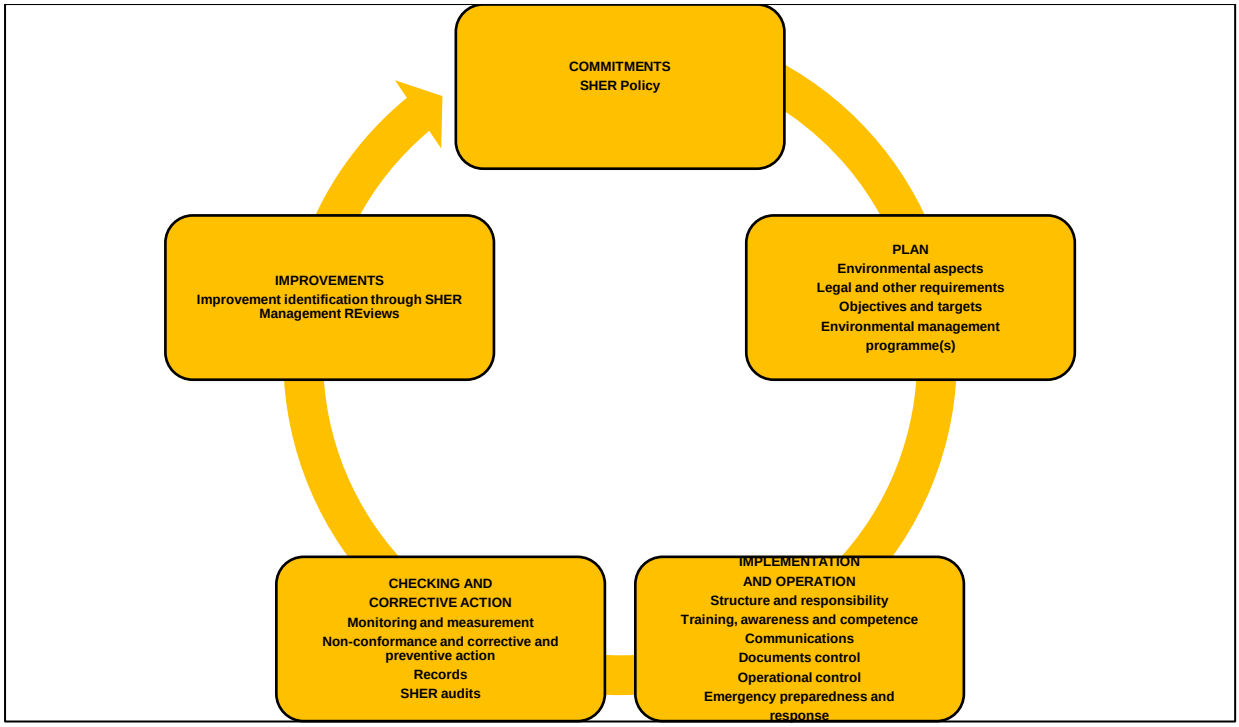


Figure 44: The ISO14001 approach is based on a Plan, Do, Check, Act (PDCA) cycle of continual improvement.

C.1.1.1. Environmental aspects and impacts identification

LHU recognised that its activities, products and services interact with the environment and as such do have an impact on its surrounding environment. In order to manage these in impacts it is important to:

- Understand what these impacts are and how they interact with the environment.
- The significance level of these impacts (risks levels).

LHU has developed and implemented procedures which describe;

- How to identify environmental aspects and impacts
  - The impacts and aspects are captured on an Impact and Aspect Register
- Assessing the level of risk and establish aspect registers and action plans.
  - The environmental risk are captured in the environmental risk assessment register.

C.1.1.2. Legal and other requirements

LHU's made a policy commitment that the organization will comply with all applicable environmental and other regulations. This commitment is solidify through the establishment, implementation and maintenance of Identification of relevant legal and other requirements Procedure which describes:

- the processes and methodology used to identify and access relevant legal and other requirements
- the process used to determine how the requirements apply to LHU's environmental aspects
- the process used to set objectives and targets that relates to compliance

- the roles, resources, responsibilities and authority who support successful operational implementation, maintenance and continuous improvement of this procedure
- the communications process
- competencies and training required
- the document control, record keeping processes
- auditing and review processes

C.1.1.3. Objectives, targets and programmes

In order to ensure LHU meets its Policy commitments and long term environmental commitments (as defined in the environmental management assessment (EIA) and Environmental management plan (EMP), continues Environmental Improvement and adhere to relevant legal and other requirements, Environmental performance objectives and targets and are developed and reviewed on an annual basis.

C.1.1.4. Resources, roles, responsibility and authority

To ensures the effective establishment and implementation of LHU EMS resources and roles with the appropriate responsibilities in place. LHU has developed and implemented a document which describe the Environmental structure and associated responsibilities. This structure is located on the

C.1.1.5. Competence, training and awareness

LHU recognized that its operational activities, products and services may have an impact on the environment. The potential significant environmental impact levels were determined through Aspect/Impact identification and evaluation processes. It is important to pro-actively manage these potential significant environmental impacts in order to avoid actual impacts. Furthermore it is important the individuals performing operational activities and services understand how their activities my impact the environment. Likewise it is important that we understand what impact our products (use and produced) may have on the environment.

Apart from awareness and understanding around the management of Aspects and Impacts associated with the operational activities, products and services of LHU is it equally important that each individual at LHU understand how to operate the EMS in order to meet Environmental Policy commitments, understand role accountability and meet compliance.

It is against this background that LHU has established, implemented an Awareness, Training and Competence procedure which describe:

- identification of employee training needs
- identification of roles, resources, responsibility and accountability in provision of training
- establishment, implementation and maintenance of training program
- document control and record keeping
- review and evaluation of effectiveness of training offered

C.1.1.6. Communication

In the environmental Policy LHU commits itself to communicate with internal and external stakeholders and interested and effected parties. Successful EMS integration requires effective communications to both internal and external stakeholders and interested and effected parties. LHU has established, implemented and is currently maintaining a Communications Procedure that describes:

- internal environmental communication across different levels and among the various functions at LHU

- the roles, responsibilities and accountabilities of the different functions
- the document control and record keeping process
- external environmental communication.

C.1.1.7. Ems documentation and document control

LHU EMS Manual provides an overview of the EMS documentation and refers to and links to other important and key EMS documents. In an effort to manage and control both the number of documents as well as the different types of documents required by the EMS and ISO 14001 (ranging from policies, procedures) that exits across LHU an environmental document control procedure was established, implemented and is currently maintain.

C.1.1.8. Operational controls

LHU recognized that its operational activities, products and services may have an impact on the environment. Potential significant environmental impacts were identified through aspect/impact identification and evaluation processes. It is important to pro-actively manage these potential significant environmental impacts in order to avoid actual impacts. Furthermore it is important that those individuals performing operational activities and services understand how their activities my impact the environment. Likewise it is important that we understand what impact our products (use and produced) may have on the environment.

Apart from awareness and understanding around the management of aspects and impacts associated with the operational activities, products and services of LHU is it equally important that each individual at LHU understand how to pro-actively manage and control any significant environmental impact associated with his/her work activities or services provided. Likewise it is important that the individual is familiar with his/her role accountability throughout the process to avoid impacts alternatively, reduced this impact as low as reasonably possible and economically feasible.

LHU must also meet various legal and other requirements. LHU has developed its EMS in accordance with the International Organisation of Standardisation (ISO) 14001 / South African National Standard (SANS) 14001: 2005 environmental management system requirements and in so doing opted to operate its EMS within the aforementioned standards requirements.

It is against this background that LHU established, implemented and currently maintaining a documented procedure for environmental operational control which establishes operational controls for those activities associated with identified potential significant environmental impacts. Implementation of this procedure will cover situations where the absence of such controls could lead to deviations from the environmental policy objectives and targets and provide a mechanism to stipulate operating criteria.

C.1.1.9. Emergency preparedness and response

As a responsible mining company LHU always strive to pro-actively managing those activities of its operation and services that may cause significant environmental impacts. LHU has identified all potential significant environmental impacts through aspect/impact identification and evaluation processes. Emergency scenarios with company implications are managed via company emergency plans, which include response measures to control the situation, and minimise environmental impact and arrangements for periodically testing the plans. Subsequently emergency preparedness and response plans were developed for these impacts. These plans describe the following:

- how to prevent an Environmental emergency
- roles, responsibilities and accountabilities of the different functions

- awareness, training, competency process
- communication plan
- mitigation and response plans
- evaluation, review , corrective and preventative plans
- document and record control
- auditing

C.1.1.10. Monitoring and measurement

Monitoring and measuring those activities of LHU's operations and services that may have a potential significant impact on the environment is crucial, since this information provides useful information to understand how the business perform against its environmental objectives, targets and goals as well as how the business meets is Environmental policy commitments. Furthermore it provides useful information to understand emerging environmental risks as well as where opportunities for environmental improvement exits. An EMS Monitoring and Measurement procedure was established, implemented and is currently maintain. This procedure describes:

- the process to identify impacts to be monitored and measured
- process and methodology use for monitoring and measured
- process for assuring that monitoring equipment is calibrated and maintained
- roles, re communication
- responsibilities and accountabilities
- awareness training and competencies
- document and record control
- auditing

C.1.1.11. Evaluation of compliance

LHU remains committed to operate its business within full compliance to relevant legal and other requirements. LHU has established, implemented and is currently maintaining a Compliance Evaluation procedure which describes:

- the methodology applied for compliance evaluating
- the frequency of evaluation of compliance
- roles, responsibilities and accountability
- awareness, training and competence
- communication
- documentation and document control
- record keeping and control

C.1.1.12. Non conformity, corrective action and preventative action

LHU established, implemented and is currently maintaining an Incident and Non-conformance management procedure which describes:

- criteria use to determine classify either as an incident or non-conformance
- process used for the reporting of incidents or non-conformances
- process of recording and incident or non-conformance
- process of incident or non-conformance investigation
- process corrective action implementation
- process of reviewing and closing out of incident or non-conformances
- communication

- documentation and document control
- record keeping and record control
- roles, resources and accountabilities
- awareness, training and competence

C.1.1.13. Control of records

In order to demonstrate that LHU have effectively implemented the ISO 14001 / South African National Standard (SANS) 14001: 2005 records are required. It is against this background that a Control of Records procedure was established, implemented and is currently maintained. This procedure describes the processes that need to be followed to identify, store, protect, retrieve, retain and dispose of records. In addition it also describes:

- roles, resources and accountabilities
- awareness, training and competence
- communication

C.1.1.14. Auditing

LHM implements a system of internal and external audits, at various levels of the organisation, to assess the effectiveness of its environmental management arrangements and identify opportunities for enhancing these. It is essential that audits are conducted effectively, in accordance with an agreed schedule, and by competent personnel to ensure that EMS arrangements are continually maintained and improved. LHU has established, implemented and is currently maintaining and Internal Audit Procedure which describes:

- roles, responsibilities and accountabilities
- audit programme
- audit type scope , frequency criteria and methodology
- criteria and process of auditor selection
- awareness, training and competence
- communication and reporting
- documentation and document control
- record keeping and record control
- review and audit close-out

C.1.1.15. Management review

A management review is carried out to evaluate the overall performance of the LHM EMS and to identify opportunities for improvement. LHU has established, implemented and is currently maintaining a Management Review Procedure which describes:

- roles, responsibilities and accountabilities
- audit programme
- Management Review scope , frequency and methodology
- communication and reporting
- documentation and document control
- record keeping and record control
- review and audit close-out

C.2. ENVIRONMENTAL MANAGEMENT AND MITIGATION PLANS

As part of the original EIA (Softchem, 2005 and Speiser, 2005), LHM has identified the environmental aspects and potential environmental impacts. Subsequently LHM has developed an aspects-impacts register as part of their process to produce the revised EMP (LHM, 2008) and to develop and implement their ISO 14001 EMS.

The 2009 and 2011 EIAs (Metago, 2009 & Metago 2011) cumulatively assessed the activities and facilities associated with LHM's operations as well as those associated with the proposed expansion projects. Therefore the aspects-impacts register were updated.

C.2.1. Current Activity / Facility Impact-Aspects

The updated activity/facility-aspects-impacts registers is presented below (Table 21).

Table 21: Impact /Aspect Register

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																				
Activities	**Aspects associated with consumption of resources**	Energy use	Water Resource	Use of Manufactured materials	Fuel consumption	**Aspects Associated with waste/pollution generation**	soil pollution	Emissions to Surface water and Ground water	Emissions to Ground Water	Emissions to land	emissions to air	**Aspects associated with noise and visual pollution**	noise pollution & vibrations	visual disturbance	**Aspects relating to archaeology**	Physical disturbance of archaeological resources	**Aspects associated with ecosystems**	physical disturbance of soil	physical disturbance of land	physical disturbance of biodiversity	physical disturbance of water courses	**Social issues and aspects associated with third party safety**	Dewatering of rivers	communication with stakeholders	Hazardous excavations and infrastructure	Radiological issues	Economies	Inward migration	Road use and traffic	Social well being	**Emergency relegated aspects**	Biodiversity	Emissions to Ground Water	Emissions to soil	Air quality	visual
CONSTRUCTION PHASE																																				
Borehole abstraction		X	X		X																X		X													
Borrow pits														X											X											
Building roads					X						X					X		X	X	X				X												
Clearing and grubbing					X						X					X		X	X	X						X										
Construction workers - Removing of vegetation and poaching																				X																
Compacting bases					X						X					X		X	X	X																
Construction of Surface water and Groundwater containment and/or diversion infrastructure – berms, channels, dams.			X		X																X				X											
Cranes														X											X											
Diesel generators					X						X																									
Dust fallout								X																												
Earth moving equipment					X								X												X	X										
Employees																														X						
Equipment maintenance servicing					X			X																												
Erecting power line		X			X															X																
Foundations														X											X											
General building activities		X			X		X	X		X	X		X					X	X	X					X											
Generators		X			X								X																							
Infrastructure establishment																X				X				X	X											
Management of dirty water							X	X		X										X																
Managing contractors (construction camp and drillers camp site)		X			X															X					X											

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																					
New construction activities																								x		x	x	x									
Opening borrow pits and trenches					x						x					x		x	x	x					x	x											
Pipelines														x																							
Power lines		x												x										x	x												
Preparation of the foundations											x					x		x	x	x																	
Roads														x																							
Sanitation									x																												
Scaffolding														x											x												
Security lights		x																		x																	
Servicing equipment		x							x											x																	
Slope stabilization					x						x					x		x	x	x																	
Soil stripping					x						x					x		x	x	x																	
Stockpiles														x											x	x											
Storage and handling of new and used materials and chemicals							x	x	x	x										x																	
Trenches														x											x												
Use of vehicles and equipment that may leak lubricants and fuel							x	x		x										x									x								
Vehicle movement					x								x			x		x	x						x				x								
Vehicle movement and exhaust fumes											x																										
Vehicle movement on access roads, internal roads and off road																				x									x								
Waste management (non-mineralised)							x	x	x	x										x						x											
OPERATIONS PHASE																																					
Backfill of mine voids and the possibility of settlement			x		x																x																
Borehole abstraction		x	x		x																x		x														
Buildings and equipment														x											x												
Construction of water containment and/or diversion infrastructure – berms, channels, dams.		x	x		x																x				x												
Conveyors		x									x														x	x											
Crushing and screening		x									x		x												x	x											
Diesel Generators					x						x																										
Dirty water management and related facilities									x																												

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																					
Drilling and blasting					X						X		X												X	X											
Dust fallout								X																													
Earth moving equipment					X								X												X												
Employees																														X							
Existing and proposed operational activities		X			X																						X	X									
Exploration					X													X	X	X																	
Fire or explosion at plant																																X			X	X
Fluorocarbons - air conditions, fridges, pressurized tins											X																										
General materials handling		X		X							X																										
General operational activities		X		X									X											X	X												
Generators		X			X								X																								
Management of dirty process water/effluent							X	X		X										X																	
Management of dirty water							X	X		X										X																	
Material handling		X																		X																	
material tipping													X																								
Mine development									X							X		X	X	X																	
Mineralised waste																										X											
Non-mineralised waste product																										X											
Open pits														X											X												
Ore																									X												
Ore processing		X		X					X											X					X												
Overburden removal					X						X																										
Pipelines									X					X																							
Pit dewatering			X																		X																
Placement of stockpiles			X		X																X																
Power lines		X												X											X												
Product (unauthorised handling)																				X																	
Sanitation									X																												
Security lights		X																		X																	
Servicing equipment		X					X	X	X	X										X																	
Soil management activities											X															X											
Soil stripping					X						X																										
Stockpile development					X				X		X					X		X	X	X						X											

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																					
Stockpiles														X											X												
Storage and handling of new and used materials and chemicals				X			X	X	X	X										X																	
Storm water Management							X	X	X	X																											
Surface water and Ground subsidence														X																							
Trenches														X																							
TSF development					X			X	X					X		X		X	X	X					X												
Evaporation ponds development					X			X	X					X		X		X	X	X					X												
TSF failure																																	X	X	X		
Use of vehicles and equipment that may leak lubricants and fuel																				X																	
Vehicle movement					X						X		X			X		X	X	X						X			X								
Vehicle movement and exhaust fumes											X																										
Vehicle movement on access roads, internal roads and off road											X									X						X			X								
Voids														X											X												
Waste management (mineralised and non-mineralised)							X	X	X	X	X					X				X						X											
CARE AND MAINTENANCE PHASE																																					
Buildings and equipment														X											X												
Cranes														X											X												
Conveyors		X									X														X	X											
Diesel generators					X						X																										
Dust fallout								X																													
Earth moving equipment					X								X												X	X											
Employees																														X							
Equipment maintenance servicing					X			X																													
Generators		X			X								X																								
General materials handling		X		X							X																										
General operational activities		X		X									X											X	X												
Management of dirty process water/effluent							X	X		X										X																	
Material handling		X																		X																	
Managing contractors		X			X															X					X												
Mineralised waste																										X											

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																				
Non-mineralised waste product																										X										
Open pits														X											X											
Pipelines														X																						
Pit dewatering			X																		X															
Power lines		X												X										X	X											
Roads														X																						
Sanitation									X																											
Scaffolding														X											X											
Security lights		X																		X																
Servicing equipment		X							X											X																
Slope stabilization					X						X					X		X	X	X																
Storage and handling of new and used materials and chemicals							X	X	X	X										X																
Trenches														X											X											
Use of vehicles and equipment that may leak lubricants and fuel							X	X		X										X									X							
Vehicle movement					X								X			X		X	X						X				X							
Vehicle movement and exhaust fumes											X																									
Vehicle movement on access roads, internal roads and off road																				X									X							
Waste management (non-mineralised)							X	X	X	X										X						X										
Voids														X											X											
DECOMMISSIONING PHASE																																				
Backfill of mine voids and the possibility of subsidence			X		X																X				X											
Borehole abstraction		X	X		X																X		X													
Clearing and grubbing					X													X	X																	
Construction of water containment and/or diversion infrastructure – berms, channels, dams.			X																		X				X											
Cranes					X									X																						
Diesel generators					X						X																									
Dirty water management and related facilities									X																											
Decommissioning activities		X		X	X																			X	X		X	X								
Dust fallout								X																												
Earth moving equipment					X								X												X											

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																					
Equipment servicing		X					X	X		X										X																	
General building activities		X					X	X		X	X							X	X	X					X												
Generators		X			X								X																								
Management of dirty water							X	X		X										X																	
Material handling				X							X									X						X											
Material movement																X		X	X	X																	
Material tipping													X																								
Mineralised waste																										X											
Non mineralised waste																										X											
Open pits														X											X												
Ore																										X											
Piles of scrap														X											X												
Piles of rubble														X											X												
Pipelines														X																							
Pit dewatering			X																		X																
Power lines		X												X											X												
Removal of infrastructure					X						X					X				X					X												
Sanitation									X																												
Scaffolding														X																							
Security lights		X																		X																	
Servicing equipment									X																												
Slope stabilization									X		X					X		X	X	X																	
Soil management activities											X															X											
Soil stripping					X													X	X																		
Stockpiles														X											X												
Stockpiles and waste facilities									X																X												
Storage and handling of new and used materials and chemicals				X			X	X	X	X										X																	
Stripping of buildings and equipment					X								X																								
Surface water and Ground Subsidence														X											X												
Trenches														X											X												
TSFs			X				X	X	X		X			X											X												
Evaporation ponds			X				X	X	X		X			X																							
Use of vehicles and equipment that may leak lubricants and fuel					X		X	X		X										X																	

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																					
Vehicle movement					X								X			X		X	X	X					X												
Vehicle movement and exhaust fumes											X																										
Vehicle movement on access roads, internal roads and off road																				X																	
Voids														X											X												
Waste management (mineralised and non-mineralised)							X	X	X	X	X															X											
Waste management (non-mineralised)																				X						X											
Waste management (mineralised)											X															X											
CLOSURE PHASE																																					
Aftercare and maintenance activities																											X										
TSF								X																													
Employees																														X							
Erosion of final land forms																		X		X																	
Final voids (if any)														X																							
Mineralised and radioactive contaminated non-mineralised waste																										X											
Other waste								X																													
Permanent stockpiles														X																							
Permanent TSF														X																							
Placement of final land forms with associated water containment and/or diversion infrastructure – berms, channels, dams			X																		X																
Remaining infrastructure – Surface water and Groundwater Management system, TSFs, other mineralised stockpiles and other wastes									X		X																										
Seepage from remaining stockpiles, catchment dams and TSF							X													X																	
Seepage, runoff and dust fallout from remaining mineralised stockpiles,								X																													
Settlement in backfilled areas			X																		X																

ALL PHASE ACTIVITIES AND FACILITIES - ASPECTS																																				
Surface water and Ground subsidence														X																						
Vegetation establishment and maintenance											X																									

C.2.2. Environmental Legislation Applicable to LHU

LHU complies with all Namibian legislation, and where legislation is lacking, will comply with internationally recognized standards of best practice to ensure that a high level of environmental compliance is realized.

During 2007 LHU developed an Environmental Legislation Register (ELR). The register identifies what legislation is applicable to environmental management at a Namibian uranium mine and makes reference to the relevant sections in these various pieces of legislation. Hard and electronic copies of legislation are available at the mine site. Employees (LHU and Contractor) are made aware and trained on the legislation related to the. The ELR is kept on the share drive so all employees with computer access have access to the register. This register is reviewed annually to ensure it remains current. LHU has developed a Standard Operating Procedure which describes the methods for identifying and updating the legal and other requirements applicable to the environmental aspects of Langer Heinrich Uranium, and for maintaining access to these requirements.

The list of key certificates and permits that have been granted to LHM are listed in the introduction (Section A.1). The originals and copies of these documents are kept on site. A summary of the legislation covered in the ELR is provided is provided below (Table 22).

Table 22: Summary of Applicable Legislation as covered in Environmental Legislation Register

YEAR	NAME	Natural Resource Use (energy and water)	Resource Use (manufactured materials)	Emissions to air (fumes, dust and odours)	Emissions to land (non-hazardous and hazardous	Emissions to water (industrial and domestic)	Radiation (environ-mental only)	Noise (remote only)	Visual	Vibrations	Impact on Land use	Impact on biodiversity	Impact on Archeology	Emergency situations	Socio-economic	Safety & Health (no legal commentary)
CURRENT NAMIBIAN LEGISLATION																
1990	The Constitution of the Republic of Namibia of 1990	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1992	The Labour Act 6 of 1992 (with regulations promulgated in 1997)			X	X	X					X			X		X
1997	Namibian Water Corporation Act, 12 of 1997	X													X	
1998	The Health Act 21 of 1988			X	X	X										X
1992	The Minerals (Prospecting and Mining) Act 13 of 1990	X		X	X	X						X				
1990	Petroleum Products and Energy Act 13 of 1990, as amended	X			X	X								X		X
1999	Road Traffic and Transport Act 22 of 1999			X	X											
2000	Petroleum Products regulations	X			X	X								X		X
2000	Electricity Act 2 of 2000	X														
1956	Explosives Act 26	X		X						X						
2001	The Forestry Act 12 of 2001	X									X	X				
2004	Water Resources Management Act, 2004	X				X									X	
2004	National Heritage Act 27 of 2004										X		X			X
2005	Atomic Energy and Radiation Protection Act 5 of 2005 (with regulations promulgated in 2012)	X		X												
2007	Environmental Management, Act 7 of 2007 (with regulations promulgated in 2011)	X	X	X	X	X	X	X	X	X	X	X	X	X		X
2011	(New) Labour Act, Act 11 of 2007 (with all regulations promulgated in 1997 retained)			X	X	X					X			X		X
2013	Water Resources Management Act, 11 of 2013 (not enforced)	X				X										
FORMER SOUTH AFRICAN AND SWA LEGISLATION STILL APPLICABLE IN NAMIBIA																

YEAR	NAME	Natural Resource Use (energy and water)	Resource Use (manufactured materials)	Emissions to air (fumes, dust and odours)	Emissions to land (non-hazardous and hazardous	Emissions to water (industrial and domestic)	Radiation (environ-mental only)	Noise (remote only)	Visual	Vibrations	Impact on Land use	Impact on biodiversity	Impact on Archeology	Emergency situations	Socio-economic	Safety & Health (no legal commentary)
1919	Public Health Act 36 of 1919			X	X	X										X
1956	Water Act 54 of 1956	X				X										
1956	Explosives Act 26 of 1956 (with regulations promulgated in 1956)															
1968	Regulations made under the provisions of the Mines, Works and Minerals ordinance, 1968 (Ordinance 20 of 1968)	X			X						X					X
1969	Soil Conservation Act 76 of 1969	X				X						X				
1974	Hazardous Substances Ordinance 14 of 1974	X	X	X	X	X								X		X
1975	Nature Conservation Ordinance 14 of 1975	X				X						X	X			
1976	Atmospheric Pollution Prevention Ordinance 11 of 1976			X												
NAMIBIAN POLICY																
1994	Policy for the Conservation of Biotic Diversity and Habitat Protection	X									X	X				X
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation	X	X	X	X	X	X	X	X	X	X	X	X	X		X
1998	Draft White Paper on the Energy Policy of Namibia	X		X												
1999	Policy for Prospecting and Mining in Protected Areas and National Monuments	X									X	X	X			X
2000	National Water Policy White Paper	X				X						X				X
2002	Minerals Policy for Namibia	X		X	X	X			X		X	X				X
PENDING NAMIBIAN LEGISLATION																
1999	Draft Pollution Control and Waste Management Bill	X		X	X	X		X		X		X		X		
1999	Draft Mine Health and Safety Regulations (10th draft)			X	X	X		X		X				X		X
2000	Draft Road Traffic and Transport Regulations		X	X	X											

YEAR	NAME	Natural Resource Use (energy and water)	Resource Use (manufactured materials)	Emissions to air (fumes, dust and odours)	Emissions to land (non-hazardous and hazardous	Emissions to water (industrial and domestic)	Radiation (environ-mental only)	Noise (remote only)	Visual	Vibrations	Impact on Land use	Impact on biodiversity	Impact on Archeology	Emergency situations	Socio-economic	Safety & Health (no legal commentary)
2002	Draft Parks and Wildlife Management Bill	X				X					X	X	X			X
INTERNATIONAL LAW																
1985	Vienna Convention for the Protection of the Ozone Layer		X	X												
1987	Montreal Protocol on substances that deplete the Ozone Layer	X	X	X												
1989	The Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal				X	X									X	
1989	The Rotterdam convention on the Prior Informed Consent Procedure for Certain Hazardous chemicals and Pesticides in International Trade		X	X	X	X						X				
1992	The Rio de Janiero Convention on Biological Diversity	X										X				X
1992	United Nations Framework Convention on Climate Change	X		X		X										
REGIONAL AGREEMENTS																
1997	Southern African Development Community (SADEC): Protocol on Mining	X									X					X
OTHER / BEST PRACTICE																
	Namib Naukluft Park Rules	X			X			X	X		X					

C.2.3. Environmental aspects and impacts of the environment impacted by LHM activities

Summary of the associated environmental aspects and potential impacts are summarised and presented below (Table 23)

Table 23: Summary of LHM environmental aspects.

Aspects associated with consumption of resources	Aspects Associated with waste/pollution generation	Aspects associated with noise and visual pollution	Aspects relating to archaeology	Aspects associated with ecosystems	Social issues and aspects associated with third parties
Energy use	Soil pollution	Noise pollution	Physical disturbance of archaeological resources	Physical disturbance of soil	Dewatering of rivers
Water Resource	Emissions to surface water	Visual disturbance		Physical disturbance of land	Communication with stakeholders
Use of Manufactured materials	Emissions to groundwater			Physical disturbance of biodiversity	Hazardous excavations and infrastructure
Fuel consumption	Emissions to land			Physical disturbance of water courses or groundwater	Radiological issues
	Emissions to air				Job creation
					Local economies
					Inward migration
					Road use

The potential impacts on the environment can be summarised as follows:

- Human (3rd party) and animal health & safety impacts.
- Disturbance/destruction of vertebrates, invertebrates and/or vegetation.
- Loss of soil resources & functionality.
- Loss of ecosystem functionality.
- Surface water pollution.
- Groundwater pollution.
- Air pollution.
- Nuisance impacts.
- Loss of natural resources - Impacts on 3rd parties.
- Impacts on tourists (tourism)/ visitors to the Naukluft National Park.
- Disturbance/destruction of archaeology, resources & landscapes.
- Impacts on Erongo regional economy and Namibian economy.
- General social impacts.
- Social well-being impacts.

C.2.4. Review

To manage the above mentioned aspects and potential impacts, LHM, have been reviewed Management and Mitigation Plans (MMPs) which are presented in Section B of this EMP to align them to the current systems and work streams applied at LHU as well as to reflect the current Care and Maintenance Phase of the mine and its associated aspects and impact.

This EMP has been reviewed and resulted in changes described below.

C.2.4.1. Exclusions

The below listed Management and Mitigations Plans (MMPs) are not included in this EMP since they are all extensively addressed through formal systems and are being the management commitments made are addressed and managed through the respective Management Systems and associated Reports. These management and mitigation Plans area available upon request.

Occupational Health and Safety Management:

Langer Heinrich has implemented a formal Health and Safety management system in accordance with the requirements of the National Occupational Safety Association, "NOSA". Since been place on care and maintenance LHU is no longer audited by NOSA inspectors but maintain this formal NOSA system. All management commitments made in the EMP submitted as part of the Stage 4 phase are being addressed and managed through this Occupational Health and Safety System Management System and associated report. It is required by the Ministry of Mines and Energy required annual OH&S performance feedback from LHU. As a member of the Chamber of Mines of Namibia, monthly feedback on OH&S performance is.

Radiological Management:

Radiation Impacts are extensively addressed through a formal Radiation Management System. Feedback on the systems performance is provided in the form of an Annual Radiation Report as per legislative requirements. All management commitments made in the EMP submitted as part of the Stage 4 phase are being addressed and managed through the Radiation Management System and associated report. The 2019 Annual Radiation Report was submitted to the National Protection Agency (NRPA) and this report is available upon request.

Socio-Economic Management:

Socio-Economic Impacts are extensively addressed through a formal Social Management System. This Social Performance Management Plan (SPMP) provides an instrument with which LHU's approach and commitment to its social responsibility is translated into practice. The SPMP details specific short and long-term social responsibility objectives, targets and activities, assigned accountabilities and timeframes. It also documents all processes undertaken in the planning and evaluation of activities. The LHU Social Performance Management System (SPMS) is consistent with the International Standards Organisation (ISO) Standards 14001 and 26000. With regard to its Social Performance, both Standards are currently applied on a non-legislative, voluntary and site level for business and industry self-regulation purposes only, as opposed to applying it for certification objectives and commitments.

C.2.4.2. Merging of EMMP's:

During this review the Surface water/storm and Groundwater Management and Mitigation Plans were merged into one Management and Mitigation Plan, now referred to as Surface water and Groundwater Management Plan.

C.2.4.3. Splitting of EMMP's

The Waste Management and Mitigation Plan were split into two separate Management Plans, namely Mineral and Non-mineral Waste Management Plan.

C.2.4.4. New EMMP's

During the update of this EMP the gap was identified to establish Chemicals, hydrocarbons, and other hazardous material. Included in this plan is a Hazardous Material Management and Mitigation Plan.

C.2.5. Management and Mitigation Plans (MMPs) included in this Environmental Management Plan

The management and mitigation plans (MMPs), listed in the table below, are applicable included in this EMP. (The MMPs follow in the subsequent sections)

- Stakeholder Consultation/Communication Management and Mitigation Plan
- Surface water and Groundwater Management and Mitigation Plan
- Non-Mineral Waste Management and Mitigation Plan
- Mineral Waste Management and Mitigation Plan
- Hazardous Management and Mitigation Plan
- Soil Management and Mitigation Plan
- Biodiversity Management and Mitigation Plan
- Noise and Vibration Management and Mitigation Plan
- Air Quality Management and Mitigation Plan
- Visual Management and Mitigation Plan
- Archaeology Management and Mitigation Plan
- Resource use Management and Mitigation Plan
- Rehabilitation Management and Mitigation Plan

C.2.5.1. Stakeholder Consultation and Communication Management and Mitigation Plan

STAKEHOLDER CONSULTATION AND COMMUNICATION MANAGEMENT AND MITIGATION PLAN								
Context	Stakeholder consultation and communication is central to LHU's SHER commitments. Understanding the information needs, concerns and aspirations of LHU's Stakeholders remains an important component of the way LHU is doing business. LHU is also well aware that open and transparent factual information sharing with our Stakeholders foster positive relations. Trust in industry, social acceptance of a project, and their underlying drivers, all form part of what has come to be known as a social licence to operate. Moreover, perceptions surrounding a mining company's social licence to operate may also influence how local residents behave in terms of participating and engaging with the project or potentially opposing it. LHM operates within the Namib Naukluft National Park, so whilst LHM does not have communities bordering the mine lease, there are a number of stakeholders (local, regional, national and international) that have an interest in how mining is conducted in the Park.							
Objective	Build strong and sustainable relationships with stakeholders based on trust and respect to stakeholders endorse and support LHU presence and operations.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Surface water and Groundwaterlegal and other requirements.	**LHU remains committed to**: • Identify all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Stakeholder Consultation/Communication. • Document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Stakeholder Consultation/Communication into a site Legal Register. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Stakeholder Consultation/Communication. • Record, report and address any non–compliances with regulatory and site requirements associated with Stakeholder Consultation/Communication. • Operate in accordance with appropriate practices and ensure that it meets relevant and regulatory requirements and commitments made. • Review and update any changes related to relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Stakeholder Consultation/Communication. **Relevant legal and other requirements** • Constitution of the Republic of Namibia, 1990. • Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • Atomic Energy and Radiation Protection Act, 5 of 2005. • The Minerals (Prospecting & Mining) Act, No 33 of 1992. • The Namibian Water Corporation Act, 12 of 1997. • The Water Act (Act 56 of 1956) • Water Resources Management Act 2004 • Labour Act, 2007 (Act No. 11 of 2007); • Regulations relating to the Health and Safety of Employees at Work promulgated in terms of Section 101 of the Labour Act 6 of 1992 (GN156, GG1617 of 1 August 1997). • Social Security Act No. 34 of 1994. • Employees Compensation Amendment Act No. 5 of 1995.	X	X	X	X	X	X

		• Affirmative Action Act (Employment) No. 29 of 1998. • Minerals Policy of Namibia, 2002. • Regulations made under the provisions of the Mines, Works and minerals ordinance of 1968 (ordinance 20 of 1968). • Abstraction and Borehole permit (Permit No. 10456) • Wastewater and effluent disposal exemption permit number 669. • Monitoring Boreholes Permits; 10996, 10831, 10770. • Mine Closure Framework. • New Equitable Economic Empowerment Framework (NEEEF). • Strategic Environmental Management Plan. • Principles of the International Finance Corporation. • Global Reporting Initiatives. • United Nations Sustainability Development Goals. • United National and International Labour Organisation Conventions. • UN International Bill of Human Rights. • UN Universal Declaration of Human Rights. • UN Guiding Principles on Business and Human Rights. • UN Global Compact. • International Labour Organisation (ILO) Declaration on Fundamental Principles and Rights at Work. • The Voluntary Principles on Security and Human Rights. • OECD Guidelines for Multinational Enterprises. • The Equator Principles. • ISO 26000. • Australian Mineral Industry Framework of Sustainable Developments. • Paladin Community Relations Policy.						
Risk Management	Pro-active management of Stakeholder Consultation/Communication risks to avoid any Stakeholder and potential social risks	**LHU remains committed to**: • Identify all relevant hazards and threat associated with Stakeholder Consultation/Communication. • Assess and evaluate the Risk level of the identified hazards and threat associated with Stakeholder Consultation/Communication and develop mitigation measures to reduce these Risks as low as reasonably practicable. • Evaluate and regularly, the identified Stakeholder Consultation/Communication impacts in accordance in accordance to the ISO 31000 Risk Management Process • Ensure that adequate resources are available to reduce these Risks as low as reasonably practicable.	X	X	X	X	X	X
Roles and Responsibilities	To ensure resources are identified and appropriately allocated for the maintenance and continual improvement of Stakeholder Consultation and Communication	**LHU remains committed to**: • LHU will ensure there are adequate financial, human, technological and organisational resources to implement and maintain Stakeholder Consultation and Communication Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • LHU will assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Stakeholder Consultation and Communication Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • Assign clear responsibilities and accountabilities for Stakeholder Consultation and Communication considering representation from across the organisational structure.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure all Employees (LHU and Contractor) are trained and understand the risks and controls associated with	**LHU remains committed to**: • Create the required capacity to effectively engage with stakeholders, including the necessary internal staffing, systems, skills and processes. • Develop and implement specific training programme for Stakeholder Consultation and Communication to enhance Employees Stakeholder Consultation and Communication skills.	X	X	X	X	X	X

STAKEHOLDER CONSULTATION AND COMMUNICATION MANAGEMENT AND MITIGATION PLAN								
	Stakeholder Consultation and Communication.	• Provide to all employees (LHU and Contractors) basic training on appropriate behaviour within local communities, including requirements of the Code of Conduct. • Provide additional specialist training shall be provided to Corporate and Community Relations employees involved in engagement activities.						
Emergency Preparedness and Response	Manage potential community health and safety risk	**LHU remains committed to**: • Develop, document maintain and implement an Emergency Management Plan that focus on communication. • Ensure adequate resources are available to keep this plan current. • Appoint competent and skilled employees who will be responsible to management this plan.	X	X	X	X	X	X
Monitoring and Measurement	Track external developments and mitigate potential risks	**LHU remains committed to**: • Have a media monitoring program. • Continuously monitor the media and engagement that will include monitoring of Paladin and LHU Risks as well as monitoring for trends within the mining industry and country.	X	X	X	X	X	X

Reporting	Managing effective and on time Reporting in accordance to Permitting, Licencing and Certification Requirements	**LHU remains committed to**:
		• Execute all external reporting in accordance to the relevant Permitting, Licencing and Certification Requirements.
		  ○ Compliance reports to Authorities: Radiation incidences and performance; Environmental incidences and performance; Safety incidences and performance. As needed/Annually.
		  ○ SEMP
		  ○ GRI
		• Report to the public and respond to enquiries and complaints as per the LHM Communication Procedure and Paladin external communication procedure.
			X	X	X	X	X	X

Communication and engagement	Pro-active management of stakeholders and potential social risks.	**LHU remains committed to:** • Ensure that stakeholder engagement focuses on the environmental and social issues that are likely to affect local communities. • Assess the effectiveness of environmental and social mitigation measures by using monitoring in communities and direct feedback. • Identify new issues, concerns or needs of affected communities including resolution of community complaints in an expedited manner. • Provide regular information about operational activities in a pro-active and timely manner. • Ensure the ongoing disclosure of information in a culturally appropriate way that is commensurate with the level of education/literacy of the target audience. • Develop key messages on local employment and training, local business development, community investment activities, environmental monitoring and community health and safety awareness. • Maximize Project benefits such as employment and procurement opportunities through effective engagement with local communities and National Government.	X	X	X	X	X	X
Stakeholder identification and analysis.	To ensure stakeholder support for LHU is retain it is important to understand stakeholders who will be affected and impacted by LHU and what their interest and ability of influence is on LHU.	**LHU remains committed to:** • Pro-actively identify, analyse and include all relevant stakeholders in engagement processes. • Maintain and update the stakeholder register, including stakeholders' needs and expectations. • Review, update and document the Stakeholder map to determine any change in Stakeholder interest.	X	X	X	X	X	X

STAKEHOLDER CONSULTATION AND COMMUNICATION MANAGEMENT AND MITIGATION PLAN								
Managing Information disclosure.	To ensure LHU honour its commitment that applicable and relevant information will be disclose in a transparent and timely manner to identified stakeholders.	**LHU remains committed to:** • LHU will ensure that a transparent procedure for both internal and external communications is in place. • Means for internal communications include formal and informal meetings with workers, bulletin boards, and boxes for suggestions.	X	X	X	X	X	X
Managing Stakeholder engagement.	Stakeholder engagement is recognised as an essential component of the appraisal, management and monitoring of environmental and social issues associated with Langer Heinrich Uranium	**LHU remains committed to:** • Develop, implement and maintain a stakeholder communication and engagement plan that is aligned to Paladin Energy's Stakeholder Communication and Engagement Strategy.	X	X	X	X	X	X
Grievance management.	Accurate and timeous decision making on issues and grievances.	**LHU remains committed to:** • Ensure an appropriate stakeholder issue and grievance management process is developed, implemented and maintain that will ensure Stakeholder issues are being managed proactively and follow a structured approach where stakeholders can raise their concerns and receive the needed feedback in a timeous manner. • Establish a grievance mechanism to receive and facilitate resolution of the affected stakeholders' concerns and grievances pertaining to LHU's environmental and social performance. • Provide a grievance mechanism for employees to raise reasonable workplace concerns use an understandable and transparent process that provides feedback to those concerned. • Capture grievances raised by affected communities to express concerns about the Community Health, Safety and Security.	X	X	X	X	X	X

C.2.5.2. Surface water and Groundwater Management and Mitigation Plan

SURFACE WATER AND GROUNDWATER MANAGEMENT AND MITIGATION PLAN								
Context	Throughout the different stages of LHU's mining life a number of activities, equipment, products and infrastructure may in an unmanaged situation result in altering of drainage patterns and the pollution of both Storm water runoff and Surface water and Groundwater resulting in reduced availability of water within and adjacent to the ML140 and ML172. In many of the identified habitats (within and outside of the LHU mining lease areas) a key ecological driver is water.							
Objective	The primary objective of this Surface water and Groundwater management plan is to maintain zero discharge of contaminated water into the surrounding environment and as such there are no off-site water transfers of contaminated water.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Surface water and Groundwater legal and other requirements.	**LHU remains committed to**: • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Surface water and Groundwater at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Surface water and Groundwater Management at LHU. • Record, report and address any non–compliances with regulatory and site requirements associated with Surface water and Groundwater. **Relevant legal and other requirements** • Constitution of the Republic of Namibia, 1990 • Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • Atomic Energy and Radiation Protection Act, 5 of 2005 • The Minerals (Prospecting & Mining) Act, No 33 of 1992 • The Namibian Water Corporation Act, 12 of 1997 • The Public Health Act, 36 of 1919 • The Water Act (Act 56 of 1956) • Water Resources Management Act 2004 • Labour Act (Act No 6) of 1992. • Minerals Policy of Namibia, 2002 • Petroleum Products and Energy Act, 13 of 1990 • Petroleum Products Regulations 2000 • Regulations made under the provisions of the Mines, Works and minerals ordinance of 1968 (ordinance 20 of 1968). • Regulations relating to the Health and Safety of Employees at Work promulgated in terms of Section 101 of the Labour Act 6 of 1992 (GN156, GG1617 of 1 August 1997) • Abstraction and Borehole permit (Permit No. 10456) • Wastewater and effluent disposal exemption permit number 669 • Monitoring BoreholesPermits;10996, 10831,10770	X	X	X	X	X	X
Risk Management	To pro-actively identify and manage Surface water and	**LHU remains committed to**:	X	X	X	X	X	X

SURFACE WATER AND GROUNDWATER MANAGEMENT AND MITIGATION PLAN								
	Groundwater Risks associated with LHM operation in order to avoid or prevent Surface water and Groundwater pollution and dewatering.	• Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Surface water and Groundwater impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Surface water and Groundwater risk. • Have a risk management register in which the identified Surface water and Groundwater Risks are documented. • Will communicate Surface water and Groundwater Risks to the identified • Provide awareness and training on the Surface water and Groundwater risk to identified Stakeholders. • Conduct risk assessment in the design phase of any new infrastructure, facility to identify and correct any potential failure scenarios that may give raise to Surface water and Groundwater Risks. • Employ environmental aspects identification and change management procedures to ensure that new developments, existing activities and facilities and substantive changes to existing facilities do not degrade the upstream and downstream quality, function, use and integrity of 'natural' water ecosystems (including ephemeral streams). • Ensure that operation of the facility conforms to approved design criteria and operational procedures and that precautionary measures are put in place to protect water ecosystems. • Develop, implement, document and review the required Surface water and Groundwater Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Surface water and Groundwater Management risks / impacts and potential deviations. • Ensure that all Plant and equipment having a potential to impact Surface water and Groundwater performance are maintained to meet design descriptions and specifications.						
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Surface water and Groundwater Management.	**LHU remains committed to**: • LHU will ensure there are adequate financial, human, technological and organisational resources to implement and maintain Surface water and Groundwater Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • LHU will assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Surface water and Groundwater Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • Assign clear responsibilities and accountabilities for water management considering representation from across the organisational structure. • Responsibilities must include tracking and reviewing progress in implementing the Water management plan.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of risks associated with Surface water and Groundwater Management.	**LHU remains committed to**: • LHU will ensure all Employees (LHU and Contractors) are trained competently and understand the risks and controls associated with Surface water and Groundwater Management. • Provide risk base training to all employees (LHU and Contractor) on the related Surface water and Groundwater Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Surface water and Groundwater Management risks / impacts and potential deviations. • All relevant workers will be trained in appropriate handling, storage and containment practices for all chemicals, hydrocarbons, and other hazardous material relevant to the role in order to avoid and remediate and any spills that may result in surface water contamination. • Ensure the Emergency Response Training is provided to employees to respond to spills, flood, infrastructure or facilities failure that may result in Surface water or Groundwater Pollution.	X	X	X	X	X	X

SURFACE WATER AND GROUNDWATER MANAGEMENT AND MITIGATION PLAN								
Emergency Preparedness and Response	Ensure effective emergency response and recovery to minimise Surface water and Groundwater pollution.	**LHU remains committed to**: • A documented Emergency Response and Contingency procedure will be prepared, maintain and review for unplanned events such as flood, failures of water storage facilities and any unplanned effluent discharges. • This plan will be regularly reviewed and updated. • LHU will ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations • All relevant workers will be trained in appropriate handling, storage and containment practices for all chemicals, hydrocarbons, and other hazardous material relevant to the role in order to avoid and remediate and any spills that may result in surface water contamination. • Ensure the Emergency Response Training is provided to employees to respond to spills, flood, infrastructure or facilities failure that may result in Surface water or Groundwater Pollution.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's impact on the water systems surrounding its environment and identify and implement appropriate mitigation measures to prevent and avoid long term impacts.	**LHU remains committed to** • To execute the Surface water and Groundwater Monitoring Program in accordance to the approved Monitoring Plan to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • The effectiveness of the LHU's Surface water and Groundwater monitoring will be regularly assessed and the Water Management Plan will be updated as necessary. • The results of LHU's water quality monitoring program will continue to be reported in the reports submitted to the identified Ministries within Government on LHU's environmental performance.	X	X	X	X	X	X
Reporting	Managing effective and on time Surface water and Groundwater Monitoring Reporting in accordance to Permitting, Licencing and Certification Requirements	**LHU remains committed to:** • Ensure that all Biodiversity Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Reportable Fauna deaths. • Reportable events that may have catastrophic impacts on the Biodiversity. • Bi-annual Environmental Performance Feedback Report. • Annual reporting (GRI, SEMP, etc.) • Ensure all internal Surface water and Groundwater Reporting will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Surface water and Groundwater Monitoring Management. • Identify, record and report all issue and concerns related to Surface water and Groundwater Monitoring management into a register.	X	X	X	X	X	X
Communication and engagement	Pro-active management of Surface water and Groundwater information to avoid any Stakeholder and potential social risks	**LHU remains committed to:** • Ensure that all Surface water and Groundwater Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Surface water and Groundwater Management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Surface water and Groundwater to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Surface water and Groundwater Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Surface water and Groundwater Management issues. • Attend and actively participate in all identified Surface water and Groundwater Stakeholder meetings.	X	X	X	X	X	X

		Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied.						
Altering of drainage patterns	To prevent the unacceptable loss of biodiversity and related functionality through a reduction in the key ecological drivers of Surface water and Groundwater flow.	Design all storm water interventions in such a way that storm water flowing from the upper reaches of the Gawib can bypass the major structures such as the TSF's and the Waste Rock Dumps and Stockpiles.	X					X
	Minimise mixing of clean and dirty water systems.	Minimise damage to the washes. Roads to be designed, constructed and maintained in a manner to ensure that storm water flow is not impeded by the road. This is of particular importance across the Reid wash.	X	X	X		X	X
	Minimise seepage into mining areas downstream thereby hampering mining	Sections of pipelines crossing the main washes should ideally be placed underground so as not to impede water flow (or be damaged from flash floods) and to allow animal movement through the wash.		X				
		Design and construct engineered structures to direct contaminated water from the processing areas, roads and offices areas to the chosen storm water control mine pit or the process pond/process circuit for storage and re-use.	X	X				X
		Carry out stability assessments of pit walls to accommodate flood events/high water table and investigate downstream conditions to identify potential risks, if any. Assess best option to deal with risk e.g. dewatering or compacted cut off.			X			X
		In the event of a flood, ensure suitably sized pumps are available to dewater mine pits quickly.		X	X	X	X	
		Ensure existing sumps to capture seepage operate optimal.			X	X		
		Clean Surface water and Groundwater diversion measures are provided around infrastructure and activities so that not all clean Surface water and Groundwater flow is restricted/captured by mine infrastructure.	X	X	X			X
		As part of ongoing mine rehabilitation, re-establish functioning sub-surface and ground layers and associated aquifers as soon as possible after mining is completed in the various sections.			X		X	X
		As far as possible avoid total destruction of the hydrology of the Gawib by keeping certain sections of the river bed in tact (e.g. those areas with the greatest stands of camel thorns).	X	X	X		X	X
		Ensuring that restoration of mined out pits commences during the operations phase.			X			
		Once the temporary TSF has been removed and once mining of the area commences all efforts shall be made to keep the wash north of this facility open.	X	X	X			X
Pollution of Surface water and Groundwater run-off	The objective of the management measures is to prevent pollution of Surface water and Groundwater run-off	Where possible, Surface water and Groundwater Management facilities and other Surface water and Ground infrastructure will be designed, constructed and operated so that dirty water is kept separate from clean water run-off through a system of berms, channels, trenches, flood protection measures, erosion protection or dams. The need for long term controls around the waste rock dumps will be determined as part of closure planning	X	X	X	X		X
		All hazardous chemicals (new and used), hydrocarbons, dirty water, mineralised wastes and non-mineralised wastes are handled in a manner that they do not contaminate Surface water and Groundwater run-off or where this is not possible, demonstrate through monitoring that the potential contamination is within acceptable limits from a human health and related risk perspective.		X	X	X	X	X

SURFACE WATER AND GROUNDWATER MANAGEMENT AND MITIGATION PLAN								
		Design and construct concrete bunded areas around all diesel generators, where required.	X	X				
		Dirty water run-off will be preferentially contained by channelling it into the mine pit and mitigation measures to prevent this water polluting the deeper paleochannel aquifer are set out the Groundwater MMP	X	X	X	X	X	X
		Ensure that where current infrastructure becomes damaged or causes Surface water and Groundwater contamination they are adequately repaired and maintained.			X	X	X	
Pollution of Surface water and Groundwater	The objective of the management measures is to prevent pollution of Surface water and Groundwater	Create, maintain, review and update a register that contains a list of all identified activities, infrastructure, equipment, products, reagents and chemicals that have the potential to pollute Surface water and Groundwater.	X	X	X	X	X	X
		Create, maintain, review and update a legal register containing a list of all identified legal and other requirements related to Surface water and Groundwater Management.	X	X	X	X	X	X
		Create, maintain, review and update a Risk Assessment Register that contains the Risk levels associated with for each identified activity, infrastructure, equipment, products, reagents and chemicals that have the potential to pollute Surface water and Ground water.	X	X	X	X	X	X
		Design and construct all physical infrastructure which will be used as containment, storage, final disposal or transport facilities of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater in manner to avoid any seepage or overflows.	X	X				X
		Construct all physical infrastructure which will be used as containment, storage, final disposal or transport facilities of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater within impermeable and bunded areas. These areas will be designed to contain 110% of the volume of one or the largest containment or storage facilities.		X			X	
		Develop and document, maintain and review Operations and Maintenance Systems (i.e. Policies, Standards, Operations Manuals, Operating Procedures, Work Instructions, Registers and Forms) for all physical infrastructure which will be used as containment, storage, final disposal or transport facilities of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater and ensure the aforementioned documented systems are current and appropriate to the level of exposure.	X	X	X	X	X	X
		Design and construct all pipes, drains, pumps, valves, etc. which will be used as containment, storage or transport facilities of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater in manner to avoid any seepage or overflows	X	X			X	X
		Construct all pipes, drains, pumps, valves, etc. which will be used as containment, storage or transport facilities of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater within impermeable and bunded areas. These areas will be designed to contain 110% of the volume of one or the largest containment or storage facilities.	X	X				X
		Develop and document Operations and Maintenance Systems (i.e. Policies, Standards, Operations Manuals, Operating Procedures, Work Instructions, Registers and Forms) for all pipes, drains, pumps, valves, etc. which will be used as containment or storage facilities of identified products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater and ensure the aforementioned documented systems are current and appropriate to the level of exposure.	X	X	X	X	X	X

		Design and construct all mobile equipment and fleet which will be used as containment, storage or transport facilities of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater in manner to avoid any seepage or overflows	X	X	X	X	X	X
		Construct all mobile equipment and fleet which will be used as containment, storage or transport facilities of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater within impermeable and bunded areas. These areas will be designed to contain 110% of the volume of one or the largest containment or storage facilities	X	X	X	X	X	X
		Develop and document Operations and Maintenance Systems (i.e. Policies, Standards, Operations Manuals, Operating Procedures, Work Instructions, Registers and Forms) for all physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage, final disposal or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater and ensure the aforementioned documented systems are current and appropriate to the level of exposure.	X	X	X	X	X	X
		Identify and appoint the required Human Resources with the correct skill-set to Operate and Maintain the physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Ground water.			X	X	X	
		Identify and provide the appropriate training to those employees who will operate and maintain the physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater to minimise Surface water and Groundwater impacts.			X	X	X	
		Identify and provide appropriate resources (e.g. Tools, Equipment etc.) to the employee who will operate and maintain the physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater to minimise Surface water and Groundwater impacts.			X	X	X	
		Verify through daily checks and inspections that the appointed employees Operate and maintain all physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater in accordance to design criteria and specification of the Operations and Maintenance Systems (i.e. Policies, Standards, Operations Manuals, Operating Procedures, Work Instructions, Registers and Forms).			X	X	X	
		Identify all legal and other relevant incident reporting requirements and develop a reporting system that ensure reporting of all incidents related to Surface water and Groundwater Management is adhered to.	X	X	X	X	X	X
		Identify those employees (LHU and contractors) who have legal requirements pertaining to Surface water and Groundwater Management and provide either awareness or ensure relevant training is provided to the identified employees to ensure all physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that have the potential to pollute Surface water and Groundwater is operated or maintained in accordance to the required Legal or related requirements.			X	X	X	
		Develop, implement, maintain and update a Flood Management Plan that will result in mitigation of any spill that may result in Surface water and Groundwater pollution.	X	X	X		X	X

		Develop, implement, maintain and review a Spill Management Procedure that will result in mitigation of any spill that may result in Surface water and Groundwater pollution.			X	X	X	
		Train all employees (LHU and Contract) in the correct application of this Spill Management Procedure appropriate to their task risk level.		X	X	X	X	
		All spills that may result in Surface water and Groundwater contamination will be dealt with in accordance to Langer Heinrich Uranium's Spill Management Procedure.		X	X	X	X	
		Develop, implement, maintain and review an Emergency Response Procedure that addresses the management of a Significant incident resulting from the failure of any physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that may have the potential to pollute Surface water and Ground Water.		X	X	X	X	
		Train all employees (LHU and Contract) in the correct application of this Emergency Response Procedure Management Procedure appropriate to their task risk level.		X	X	X	X	
		Periodically test the emergency response plan.		X	X	X	X	
		Develop, implement, maintain and review an Incident Management Procedure and train all employees (LHU and Contractors) in the correct application of this Incident Management Procedure.		X	X	X	X	
		Reporting of all spillages must be done in accordance to LHU's Incident Management Procedures		X	X	X	X	
		Develop, implement, maintain and review an Investigation Procedure and train all employees (LHU and Contractors) in the correct application of this Incident Management Procedure appropriate to their task risk level.		X	X	X	X	
		Ensure that the monitoring of all tanks, pipelines and bunds are included in the daily inspection programme to develop an early detection system for leaks.		X	X	X	X	
		Conduct periodic inspections of physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that may have the potential to pollute Surface water and Groundwater		X	X	X	X	
		Identify the requirement for external (2'nd party or 3'rd party) auditing and arrange auditing of applicable of physical infrastructure, pipe, drain, pump, sump, valves, mobile equipment and fleet that serves either as a containment, storage or transport facility of identified; products, reagents and chemicals (e.g. hydrocarbons) that may have the potential to pollute Surface water and Groundwater to ensure compliance conditions are met.	X	X	X		X	
Altering of drainage patterns	To prevent the unacceptable loss of biodiversity and related functionality through a reduction in the key ecological drivers of Surface water and Groundwater flow.	Design all storm water interventions in such a way that storm water flowing from the upper reaches of the Gawib can bypass the major structures such as the TSF's and the Waste Rock Dumps and Stockpiles.	X					X
	Minimise mixing of clean and dirty water systems.	Minimise damage to the washes. Roads to be designed, constructed and maintained in a manner to ensure that storm water flow is not impeded by the road. This is of particular importance across the Reid wash.	X	X	X		X	X

SURFACE WATER AND GROUNDWATER MANAGEMENT AND MITIGATION PLAN								
	Minimise seepage into mining areas downstream thereby hampering mining	Sections of pipelines crossing the main washes should ideally be placed underground so as not to impede water flow (or be damaged from flash floods) and to allow animal movement through the wash.		X				
		Design and construct engineered structures to direct contaminated water from the processing areas, roads and offices areas to the chosen storm water control mine pit or the process pond/process circuit for storage and re-use.	X	X				X
		Carry out stability assessments of pit walls to accommodate flood events/high water table and investigate downstream conditions to identify potential risks, if any. Assess best option to deal with risk e.g. dewatering or compacted cut off.			X			X
		In the event of a flood, ensure suitably sized pumps are available to dewater mine pits quickly.		X	X	X	X	
		Ensure existing sumps to capture seepage operate optimal.			X	X		
		Clean Surface water and Groundwater diversion measures are provided around infrastructure and activities so that not all clean Surface water and Groundwater flow is restricted/captured by mine infrastructure.	X	X	X			X
		As part of ongoing mine rehabilitation, re-establish functioning sub-surface and Ground layers and associated aquifers as soon as possible after mining is completed in the various sections.			X		X	X
		As far as possible avoid total destruction of the hydrology of the Gawib by keeping certain sections of the river bed in tact (e.g. those areas with the greatest stands of camel thorns).	X	X	X		X	X
		Ensuring that restoration of mined out pits commences during the operations phase.			X			
		Once the temporary TSF has been removed and once mining of the area commences all efforts shall be made to keep the wash north of this facility open.	X	X	X			X
Dewatering	The objective of the management measures is to prevent the loss of Groundwater to farmers and vegetation (and ecosystems) in the region.	Ensure that, in line with the permit, water abstraction from the Swakop river (Langer Heinrich Compartment) is restricted to abstraction permit conditions.			X			
		Monitor the water levels in the Swakop River, up and down stream of the abstraction boreholes in accordance to permit conditions		X	X	X	X	X
		Optimise use of water on site to minimise the need for Swakop water and monitor the Swakop pipeline regularly to detect and repair leaks.		X	X	X	X	
		Use the result from the Groundwater model in Life of Mine and mine closure planning.	X				X	X
		Ensure that relevant permits pertaining to Groundwater. Groundwater abstraction is renewed as required.		X	X	X	X	
		Monitor the Groundwater levels up- and downstream of the mined out pits		X	X	X	X	
		Backfill the mined out pits and the natural valley and rehabilitate the alluvial Surface water and Ground.	X	X	X			X
Contamination of Ground Water	The objective of the management measures is to prevent unacceptable	Avoid mining of deep paleochannel aquifer where economically feasible	X	X	X			
		Re-instate the paleochannel where necessary to a minimum cross sectional area above the basement contact such that the active aquifer may be re-instated and aquifer flow uninterrupted.		X	X			X

SURFACE WATER AND GROUNDWATER MANAGEMENT AND MITIGATION PLAN								
	Groundwater pollution related impacts	Prevent leakage of tailings water into underlying paleochannel and deep aquifer primarily by means of a low permeability layer (e.g. compacted crushed calcrete) placed above the backfilled paleochannel.	X	X	X	X	X	X
		In pit tailings will be covered with a layer of low permeable material to prevent Surface water and Ground clean water interacting with tailings and allowing water flow to continue uninterrupted along the Gawib River.		X	X			
		Inspect and maintain the Swakop pipeline regularly to detect and repair leaks.			X			
		Backfill the mined out pits and the natural valley and rehabilitate the alluvial Surface water and Ground.			X			X
		Restore the hydrological regime (shallow and deep) at mine closure so that recharge of the system can occur and so that water will again flow through the Gawib channel.						X
		Re-instate the paleochannel where necessary to a minimum cross sectional area above the basement contact such that the active aquifer may be re-instated and aquifer flow uninterrupted.						X
		Prevent leakage of tailings water into underlying paleochannel and deep aquifer primarily by implementing the Tailings Storage Facility design operating criteria.	X	X	X			
		For each tailings compartment/pit suitable drainage and seepage collection systems will be installed.	Z	X	X			
		The reconstruction of the Gawib River alluvium should be coordinated and planned together with the deposition of tailings and backfill activities in the mine pit;	X	X	X			
		Contain any polluted seepage by means of impermeable liners that comprises compacted calcrete possibly in combination with an impermeable synthetic liner.		X	X	X		
		Collection and reuse of excess seepage, rainfall and run-off water by means of collection and pumping facilities		X	X	X	X	X
		Seepage from the existing and proposed processing plant will be captured in sumps and recycled.			X	X		
		Where relevant appropriate seepage capture systems will be installed for seepage water from stockpiles and waste rock dumps.			X	X	X	X
		Capture intercepted contaminated seepage in pit sumps to prevent it from mixing with clean ground/Surface water and Groundwater inflows;		X	X	X	X	
		Install piezometers around tailings facilities and paleochannel		X	X			
		Maintain and implement response procedures to deal with seepage when it is detected (different responses may be required at different facilities).		X	X	X	X	
		Environmental inspections, audits and monitoring will be undertaken in accordance with the procedures			X	X	X	

C.2.5.3. Non-Mineral Waste Management and Mitigation Plan

NON-MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
Context	Waste is generated during all phases of the mine. This MMP deals with Non-Mineral solid waste and providing measures to manage waste relating to the LHM waste classification below: • Waste from industrial and domestic sources. • Hazardous and non-hazardous waste. • Radioactive contaminated and non-contaminated waste. Liquid waste (effluent) is dealt with under the Surface water/storm water MMP and Mineralised waste is dealt with in the Mineralise Waste Management Plan							
Objective	Efficient use of resources and minimisation of waste generation and ensuring the safe handling, treatment and disposal of non-mineral waste.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Non-Mineral Waste legal and other requirements.	**<u>LHU remains committed to</u>**: • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Non-Mineral Waste at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Non-Mineral Waste Management at LHU. • Record, report and address any non–compliances with regulatory and site requirements associated with Non-Mineral Waste Management. • Permits (Wastewater discharge, explosive packaging disposal, waste disposal at landfills) shall be kept up to date by the relevant parties. **<u>Relevant legal and other requirements</u>** • Constitution of the Republic of Namibia, 1990 • Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • Atomic Energy and Radiation Protection Act, 5 of 2005 • The Minerals (Prospecting & Mining) Act, No 33 of 1992 • The Namibian Water Corporation Act, 12 of 1997 • The Public Health Act, 36 of 1919 • The Water Act (Act 56 of 1956) • Water Resources Management Act 2004 • Labour Act (Act No 11) of 2007. • Minerals Policy of Namibia, 2002 • Petroleum Products and Energy Act, 13 of 1990 • Petroleum Products Regulations 2000 • Regulations made under the provisions of the Mines, Works and minerals ordinance of 1968 (ordinance 20 of 1968). • Regulations relating to the Health and Safety of Employees at Work promulgated in terms of Section 101 of the Labour Act 6 of 1992 (GN156, GG1617 of 1 August 1997)	X	X	X	X	X	X

		• Namib Naukluft Park Permit conditions.						
Risk Management	To pro-actively identify and manage Non-Mineral Waste Risks associated with LHM operation in order to avoid and minimise the risk of pollution from non-mineralized waste as a result of LHM's operations.	**LHU remains committed to**: • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Non-Mineral Waste impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Non-Mineral Waste risk. • Have a risk management register in which the identified Non-Mineral Waste Risks are documented. • Provide awareness and training on the Non-Mineral Waste risk to identified Stakeholders. • Conduct risk assessment in the design phase of any new infrastructure, facility to identify and correct any potential failure scenarios that may give raise to Non-Mineral Waste Risks. • Employ environmental aspects identification and change management procedures to ensure that new developments, existing activities and facilities and substantive changes to existing facilities do not degrade the upstream and downstream quality, function, use and integrity of 'natural' water ecosystems (including ephemeral streams). • Ensure that operation of the facility conforms to approved design criteria and operational procedures and that precautionary measures are put in place to protect water ecosystems. • Develop, implement, document and review the required Non-Mineral Waste Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Non-Mineral Waste Management risks / impacts and potential deviations. • Ensure that all Plant and equipment having a potential to impact Non-Mineral Waste performance are maintained to meet design descriptions and specifications. • Ensure that non-mineral wastes are segregated at generation and that wastes awaiting further treatment, transport or disposal are securely contained and monitored. • Disposal of waste must only be carried out in engineered and approved facilities and in accordance with established operational procedures and applicable local laws and regulations. • Maintain operational procedures and effective controls for the safe handling, on-site and off-site transportation, storage and disposal of non-mineral wastes commensurate with their degree of hazard and compatibility.	X	X	X	X	X	X
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Non-Mineral Waste Management.	**LHU remains committed to:** • LHU will ensure there are adequate financial, human, technological and organisational resources to implement and maintain Non-Mineral Waste Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • LHU will assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Non-Mineral Waste Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • Assign clear responsibilities and accountabilities for water management considering representation from across the organisational structure.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of risk associated with Non-Mineral Waste Management.	**LHU remains committed to:** • LHU will ensure all Employees (LHU and Contractors) are trained competently and understand the risks and controls associated with Non-Mineral Waste Management. • Provide risk base training to all employees (LHU and Contractor) on the related Non-Mineral Waste Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Non-Mineral Waste Management risks / impacts and potential deviations.	X	X	X	X	X	X

NON-MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
		• All relevant workers will be trained in appropriate handling, storage and containment practices for Non-mineral waste relevant to the role in order to avoid and remediate and any spills that may result in surface water contamination.						
Emergency Preparedness and Response	Ensure effective emergency response and recovery to minimise Non-Mineral Waste pollution.	**<u>LHU remains committed to:</u>** • LHU will ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations • All relevant workers will be trained in appropriate handling, storage and containment practices for all chemicals, hydrocarbons, and other hazardous material relevant to the role in order to avoid and remediate and any spills that may result in surface water contamination. • Ensure the Emergency Response Training is provided to employees to respond to spills, flood, infrastructure or facilities failure that may result in Surface water or Groundwater Pollution.	**X**	**X**	**X**	**X**	**X**	**X**
Monitoring and Measurement	To evaluate LHU's generation of Non-Mineral Waste and ensuring that end-of life Non-Mineral Waste is disposed in accordance to relevant legal and other requirements.	**<u>LHU remains committed to</u>** • To execute the Non-Mineral Waste Monitoring Program in accordance to the approved Monitoring Plan to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • The effectiveness of the LHU's Non-Mineral Waste monitoring will be regularly assessed and the Water Management Plan will be updated as necessary. • The results of LHU's water quality monitoring program will continue to be reported in the reports submitted to the identified Ministries within Government on LHU's environmental performance. • Monitoring adherence to permit conditions and requirements. • Quantities of Non-Mineral waste removed from site shall be recorded by weighing the vehicles containing the waste at the on-site weigh bridge.	**X**	**X**	**X**	**X**	**X**	**X**

Reporting	Managing effective and on time Non-Mineral Waste Monitoring Reporting in accordance to Permitting, Licencing and Certification Requirements	**<u>LHU remains committed to:</u>**
		• Ensure that all Non-Mineral Waste Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• Ensure all internal Non-Mineral Waste Reporting will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Surface water and Groundwater Monitoring Management.
		• Identify, record and report all issue and concerns related to Non-Mineral Waste Management into a register.
			X	**X**	**X**	**X**	**X**	**X**

Communication and engagement	Pro-active management of Non-Mineral Waste information to avoid any Stakeholder and potential social risks	**<u>LHU remains committed to:</u>** • Ensure that all Non-Mineral Waste Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Non-Mineral Waste management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Non-Mineral Waste to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Non-Mineral Waste Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Non-Mineral Waste Management issues. • Attend and actively participate in all identified Non-Mineral Waste Stakeholder meetings.	**X**	**X**	**X**	**X**	**X**	**X**

NON-MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
		• Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied.						
Non-hazardous non-radioactive contaminated solid waste (non-mineralised)	The objective of the management measures is to ensure proper storage, removal, transportation and disposal of non-hazardous non-radioactive solid waste.	The waste management procedure for LHM will cover the storage, handling, and transportation of waste. Contractors will be made aware of this procedure which includes their responsibilities.	X	X	X	X	X	X
		Waste streams will be identified as new types of waste are generated and the company waste inventory will be updated accordingly.	X	X	X	X	X	X
		Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity.	X	X	X	X	X	X
		General domestic and recyclable waste from all mine facilities will be temporarily stored in appropriate secure and durable containers until permanent removal from site collection points.	X	X	X	X	X	X
		Domestic waste will be segregated into general and recyclable (for example paper, cardboard, glass, cans, plastics) waste to reduce waste volumes to landfills.	X	X	X	X	X	X
		Waste storage areas and containers will meet the risk needs for the specific waste (e.g. impervious floor, bunded areas with drainage/containment systems, lids to prevent light material from blowing away or sealed containers for hazardous material).	X	X	X	X	X	X
		Industrial waste generated at workshops and stores will be properly segregated and stored in durable, secure containers.	X	X	X	X	X	X
		Industrial waste will be recovered and stored at controlled Lay-down areas and salvage yards for reuse whenever appropriate.	X	X	X	X	X	X
		Segregated waste will be scanned for potential radiation contamination before loading and removal from site. An equipment release certificate will be issued for waste approved for offsite removal.	X	X	X	X	X	X
		Approved waste management contractor(s) will undertake waste removal from site, transport and disposal at permitted Municipal landfills/facilities and distribution to recycling facilities.	X	X	X	X	X	X
		Disposal and distribution of waste will be made at appropriate permitted waste disposal and recycling facilities as follows: • Recyclable to identified recycling companies. • Non-recyclable, non-hazardous waste at the Walvis Bay or Swakopmund municipal landfills.	X	X	X	X	X	X
		Documented evidence of radiation level readings, quantities of waste removed, types of waste removed, safe disposal and acknowledgement certificates (where appropriate) will be kept as records.	X	X	X	X	X	X
Non-Hazardous & Hazardous Radioactive Contaminated Solid Waste	The objective of the management measures is to ensure proper storage and disposal of non-hazardous and	The waste management procedure for LHM will cover the storage, handling, and disposal of radioactive contaminated waste.	X	X	X	X	X	X
		All employees (LHU and Contractors) will be made aware of the risks associated with radiation contamination and the handling and disposal of such waste.	X	X	X	X	X	X

NON-MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
	hazardous radioactive contaminated solid waste.	All waste exceeding radiation levels as per IAEA requirements of waste destined to be released into the public domain will remain onsite.	X	X	X	X	X	X
		Areas with potential radiation contamination transfer will be identified and control measures implemented as per procedure.	X	X	X	X	X	X
		Designated waste collection points will be established on site. Care will be taken to ensure there will be sufficient collection points with adequate capacity.	X	X	X	X	X	X
		Care will be taken to prevent cross contamination of “dirty” and “clean” wastes by providing storage containers nearest to risk areas.	X	X	X	X	X	X
		Yellow, well labelled containers will be used to store radiation contaminated waste generated from the “Risk Areas” (Plant, Recovery and Laboratory areas).	X	X	X	X	X	X
		Waste storage areas at Recovery and laboratory have concrete floors or bunded areas. Containers have lids and are sealed for better control of hazardous waste.	X	X	X	X	X	X
		Smaller containers (yellow wheelie bins) may be located at specific areas for smaller radioactive contaminated waste.	X	X	X	X	X	X
		All radioactive contaminated waste will be disposed of at the dedicated controlled waste disposal facility on the identified and permitted Waste Rock Dumps.	X	X	X	X	X	X
		Records of waste types, sources, quantities (estimated and/or weighed), ad-hoc radiation levels and site locations will be continuously maintained.	X	X	X	X	X	X
Hazardous Non-Radioactive Contaminated Solid Waste (Non-Mineralised)	The objective of the management measures is to ensure proper storage, removal, transportation and disposal of Hazardous non-radioactive solid waste.	The waste management procedure for LHM will cover the storage, handling, and transportation of waste. Contractors will be made aware of this procedure which includes their responsibilities.	X	X	X	X	X	X
		Waste streams will be identified as new types of waste are generated and the company waste inventory will be updated accordingly.	X	X	X	X	X	X
		Designated waste collection points will be established on site. Care will be taken to ensure that there will be sufficient collection points with adequate capacity.	X	X	X	X	X	X
		Collection of hazardous waste will be by pre-arrangement with relevant organisations, personnel, facilities.	X	X	X	X	X	X
		Hazardous waste will be stored in secured suitable containers and accumulated until such time that sufficient quantities can be removed from site.	X	X	X	X	X	X
		All hazardous waste containers will be well labelled to identify the type of waste stored.	X	X	X	X	X	X
		Hydrocarbon contaminated soils will be treated at the LHM bioremediation treatment site during all stages except during care and maintenance.	X	X	X	X	X	X
		Explosives packaging shall be safely burnt/incinerated at the magazine site according to permit conditions and procedures.	X	X	X	X	X	X

NON-MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
		Medical waste shall be stored in appropriate containers at the First Aid centre until removed for disposal at identified approved facility.	X	X	X	X	X	X
		Ensure that waste storage areas and/or containers meet the risk needs for that specific waste (e.g. impervious floor, bunded areas with drainage/containment systems, lids to prevent light material from blowing away or sealed containers for hazardous material).	X	X	X	X	X	X
		An approved contractor or transport company will undertake the bulk waste transport of hazardous waste to the Walvis Bay Hazardous waste site or recycling facilities.	X	X	X	X	X	X
		Smaller volumes of hazardous waste may be transported by LHM or couriered to various sites for recycling (e.g. Printer cartridges)	X	X	X	X	X	X
		All hazardous waste will be transported as per relevant requirements.	X	X	X	X	X	X
		Waste will be disposed at appropriate permitted waste disposal facilities as follows: • Hazardous waste shall be removed from site and may be disposed of at a registered and permitted Hazardous waste management facility (e.g. Walvis Bay Hazardous Storage facility) or recycled at appropriate recycling companies. • Spoiled/redundant reagents and damaged and used reagent bags will be handled by the supplier for repairs, reuse or disposal. • All hazardous waste shall be checked for radiation levels by the Radiation Safety Officer before removal from site or a person trained in radiation clearance. • Written evidence of safe disposal, reused and/or recycled waste will be kept.	X	X	X	X	X	X
Medical Waste	The objective of the management measures is to ensure proper storage, removal, transportation and disposal of medical waste.	The medical waste handling procedure for LHM will cover the storage, handling, and transportation of all medical waste. Ensure that the contractor's responsible are made aware of these procedures.	X	X	X	X	X	X
		Incinerate the medical waste offsite at an approved medical facility.	X	X	X	X	X	X
		Medical waste shall be incinerated at Hospital incinerators.	X	X	X	X	X	X

C.2.5.4. Mineral Waste Management and Mitigation Plan

MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
Context	Waste is generated during all phases of the mine. Mineral Waste constitutes all mineralised material that cannot be processed further either because of constraints related to current metallurgical technology and processes or due to the current low uranium commodity price or both. Mineralised waste is further categorised into mined mineralised waste rock and processed mineralised waste. Liquid waste (effluent) is dealt with under the Surface water/storm water and Groundwater MMP and Non-Mineralised waste is dealt with in the Non-Mineralised Waste Management Plan.							
Objective	The intent of this Standard is to ensure environmentally sound and effective management of mining and process wastes generated or handled by Langer Heinrich Mine. Waste disposal facilities and sites must be physically, biologically and chemically safe. Waste production and disturbed footprint shall be minimised and waste re-use, in-pit backfill, progressive rehabilitation and recycling maximised.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Mineral Waste legal and other requirements.	**<u>LHU remains committed to:</u>** • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Surface water and Groundwater at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Surface water and Groundwater Management at LHU. • Record, report and address any non–compliances with regulatory and site requirements associated with Surface water and Ground Water. **<u>Relevant legal and other requirements</u>** • Constitution of the Republic of Namibia, 1990 • Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • Atomic Energy and Radiation Protection Act, 5 of 2005 • The Minerals (Prospecting & Mining) Act, No 33 of 1992 • The Namibian Water Corporation Act, 12 of 1997 • The Public Health Act, 36 of 1919 • The Water Act (Act 56 of 1956) • Water Resources Management Act 2004 • Labour Act (Act No 6) of 1992. • Minerals Policy of Namibia, 2002 • Petroleum Products and Energy Act, 13 of 1990 • Petroleum Products Regulations 2000 • Regulations made under the provisions of the Mines, Works and minerals ordinance of 1968 (ordinance 20 of 1968). • Regulations relating to the Health and Safety of Employees at Work promulgated in terms of Section 101 of the Labour Act 6 of 1992 (GN156, GG1617 of 1 August 1997). • Abstraction and Borehole permit (Permit No. 10456). • Wastewater and effluent disposal exemption permit number 10669. • Monitoring Boreholes Permits; 10996, 10831, 10770.	X	X	X	X	X	X

MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
Risk Management	To pro-actively identify and manage Mineral Waste Risks associated with LHM operation in order to avoid and minimise the risk of pollution from non-mineralized waste as a result of LHM's operations.	**LHU remains committed to:** • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Mineral Waste impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Mineral Waste risk. • Have a risk management register in which the identified Mineral Waste Risks are documented. • Provide awareness and training on the Mineral Waste risk to identified Stakeholders. • Conduct risk assessment in the design phase of any new infrastructure, facility to identify and correct any potential failure scenarios that may give raise to Mineral Waste Risks. • Employ environmental aspects identification and change management procedures to ensure that new developments, existing activities and facilities and substantive changes to existing facilities do not degrade the upstream and downstream quality, function, use and integrity of 'natural' water ecosystems (including ephemeral streams). • Ensure that operation of the facility conforms to approved design criteria and operational procedures and that precautionary measures are put in place to protect water ecosystems. • Develop, implement, document and review the required Mineral Waste Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Mineral Waste Management risks / impacts and potential deviations. • Ensure that all Plant and equipment having a potential to impact Mineral Waste performance are maintained to meet design descriptions and specifications. • Ensure that Mineral Wastes are segregated at generation and that wastes awaiting further treatment, transport or disposal are securely contained and monitored. • Disposal of waste must only be carried out in engineered and approved facilities and in accordance with established operational procedures and applicable local laws and regulations. • Maintain operational procedures and effective controls for the safe handling, on-site and off-site transportation, storage and disposal of Mineral Wastes commensurate with their degree of hazard and compatibility.	**X**	**X**	**X**	**X**	**X**	**X**
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Mineral Waste Management.	**LHU remains committed to:** • LHU will ensure there are adequate financial, human, technological and organisational resources to implement and maintain Mineral Waste Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • LHU will assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Mineral Waste Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • Assign clear responsibilities and accountabilities for water management considering representation from across the organisational structure.	**X**	**X**	**X**	**X**	**X**	**X**
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of risk associated with Mineral Waste Management.	**LHU remains committed to:** • LHU will ensure all Employees (LHU and Contractors) are trained competently and understand the risks and controls associated with Mineral Waste Management. • Provide risk base training to all employees (LHU and Contractor) on the related Mineral Waste Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Mineral Waste Management risks / impacts and potential deviations. • All relevant workers will be trained in appropriate handling, storage and containment practices for Mineral Waste relevant to the role in order to avoid and remediate and any spills that may result in surface water contamination.	X	X	X	X	X	X

MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
Emergency Preparedness and Response	Ensure effective emergency response and recovery to minimise Mineral Waste pollution.	**LHU remains committed to:** • LHU will ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations • All relevant workers will be trained in appropriate handling, storage and containment practices for all chemicals, hydrocarbons, and other hazardous material relevant to the role in order to avoid and remediate and any spills that may result in surface water contamination. • Ensure the Emergency Response Training is provided to employees to respond to spills, flood, infrastructure or facilities failure that may result in Surface water or Groundwater Pollution.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's generation of Mineral Waste and ensuring that end-of life Mineral Waste is disposed in accordance to relevant legal and other requirements.	**LHU remains committed to:** • To execute the Mineral Waste Monitoring Program in accordance to the approved Monitoring Plan to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • The effectiveness of the LHU's Mineral Waste monitoring will be regularly assessed and the Water Management Plan will be updated as necessary. • The results of LHU's water quality monitoring program will continue to be reported in the reports submitted to the identified Ministries within Government on LHU's environmental performance. • Monitoring adherence to permit conditions and requirements. • Monitor chemistry of the tailings daily. • Monitor surface water quality in TSFs regularly. • All waste storage area will be regularly inspected condition of storage area, containment and appropriateness of storage. • On a weekly basis, monitor groundwater for seepage from TSFs and manage the findings accordingly. • Monitor water levels in seepage monitoring boreholes to detect abnormal water flows. • Develop a process to monitor uranium concentrations and pH of the borehole water. These parameters are used as markers to show if water originates from the TSFs. • The site waste register will be regularly reviewed to identify the general volume trends and waste reduction opportunities. • Environmental inspections, monitoring will be undertaken in accordance with procedures	**X**	**X**	**X**	**X**	**X**	**X**

Reporting	Managing effective and on time Mineral Waste Monitoring Reporting in accordance to Permitting, Licencing and Certification Requirements	**LHU remains committed to:**
		• Ensure that all Mineral Waste Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• Ensure all internal Mineral Waste Reporting will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Surface water and Groundwater Monitoring Management.
		• Identify, record and report all issue and concerns related to Mineral Waste Management into a register.
			X	**X**	**X**	**X**	**X**	**X**

Communication and engagement	Pro-active management of Non-Mineral Waste information to avoid any Stakeholder and potential social risks	**LHU remains committed to:** • Ensure that all Mineral Waste Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Mineral Waste management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Mineral Waste to the identified Interested and Affected Parties.	X	X	X	X	X	X

		• Ensure that information pertaining to LHU Mineral Waste Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Mineral Waste Management issues. • Attend and actively participate in all identified Mineral Waste Stakeholder meetings. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied.						
Mineralised Waste	The objective of the management measures is to ensure proper design, stockpiling and monitoring of waste rock material.	Avoid constructing waste dumps and low grade stockpiles in areas where it is not possible to contour and shape them to fit into their surroundings. As far as possible backfill waste into mined out pits and locate stockpiles in sterilised sections of the pits.	X	X	X			
		Permanent aboveground waste facilities and stockpiles that will remain at closure will be designed and constructed in a manner to present land forms that have similar safety attributes to the natural land forms in the area. In this regard, structures will be stable, protected from flood damage, final voids will be backfilled and steep slopes will be contoured.	X	X	X		X	X
		As far as possible, stockpile low grade ore on previously disturbed sites.		X	X			
		If new areas of land are to be disturbed, ensure that all potential environmental aspects of the area are considered and implement the land disturbance procedure.	X	X	X		X	X
		Ensure that the important principle of minimising the disturbance footprint of mining and associated activities is included in mine planning. This will include backfilling as much waste as possible into mined out pits and minimising creation of Surface water and Ground stockpiles.	X	X	X		X	
		Develop and implement a guideline for optimum design of dumps and stockpiles that achieves a balance between size of footprint and stability of facilities (for safety and rehabilitation purposes).	X	X	X			X
		Avoid placement of dumps on the eastern side of the ML. If this is impossible, use the biodiversity sensitivity plans to ensure that waste rock dumps, stockpiles are as far as practically possible not located in areas rated as highly sensitive (orange) or irreplaceable (red).	X	X	X		X	X
		As far as possible avoid placing permanent structures in washes or at the mouths of washes.	X	X	X		X	X
		Develop a rehabilitation plan to ensure that all waste dumps and remaining stockpiles can be rehabilitated into functioning ecological units. Where this is not possible, biodiversity offsets must be investigated in line with the biodiversity management programme.			X			
		As part of rehabilitation planning, where stockpiles remain at closure, storm water must be diverted away from the waste rock dumps and stockpiles to ensure that these structures do not erode, thereby transporting waste material into restored or undisturbed areas and undermining the stability of the dumps.	X	X	X		X	X
		The waste dumps on the schists are located outside of washes. Prior to closure these dumps must be restored in such a way that they do not erode and that water flows off them into the adjacent tributaries.	X	X	X			X
		If seepage occurs, contain the seepage and pump this contaminated water to the TSF and into the process pond for reuse in the plant.		X	X	X	X	X

		Once the final configuration of the post closure mineralised waste stockpiles is understood, the stockpile(s) should be considered as potential long term pollution sources and additional modelling should be done as has been done for the TSFs.	X	X	X		X	X
		Conduct independent and external review by qualified engineering specialist(s) of all major waste storage facilities according to protocols and frequencies adequate to their physical and chemical hazards and level of risks hazards. Any significant findings must be reported according to LHU requirements.	X	X	X	X	X	X
Tailings Material	The objective of the management measures is to ensure handling of tailings material and design for TSFs (in-pit and permanent above-ground).	Re-instate the paleochannel where necessary to a minimum cross sectional area above the basement contact such that the active aquifer may be re-instated and aquifer flow uninterrupted.	X	X	X		X	X
		Prevent leakage of tailings water into underlying paleochannel and deep aquifer primarily by means of a low permeability layer (e.g. compacted crushed calcrete) placed above the backfilled paleochannel.	X	X	X			
		In pit tailings will be covered with a layer of low permeable material to prevent Surface water and Ground clean water interacting with tailings and allowing water flow to continue uninterrupted along the Gawib River.	X	X	X			
		For each tailings compartment/pit suitable drainage and seepage collection systems will be installed.	X	X	X			
		The reconstruction of the Gawib River alluvium should be coordinated and planned together with the deposition of tailings and backfill activities in the mined pit.	X	X	X			
		Contain any polluted seepage by means of impermeable liners that comprises compacted calcrete possibly in combination with an impermeable synthetic liner.	X	X	X	X	X	X
		Collection and reuse of excess seepage, rainfall and run-off water by means of collection and pumping facilities.	X	X	X	X	X	X
		Ensure that artificial dams are not created on the southern (upstream) sides of the TSF. This water is diverted around the TSF and allowed to join up with a tributary that can take the water downstream of the ML, thus avoiding the creation of permanent pools.	X	X	X			
		Conduct risk assessments to understand situations when failure of TSF could occur.	X	X	X	X	X	X
		Design and manage the TSFs to prevent failure.	X	X	X			
		Develop and implement emergency strategy to deal with massive flows of slurry tailings generated from a breach in a TSF wall.	X	X	X			
		Conduct regular visual inspections of the condition of surrounding vegetation (trees and shrubs).	X	X	X	X	X	X
		Ensure that all supernatant water is captured, and pumped back to the process pond or TSF'S.	X	X	X	X	X	X
		Barriers and/or warning signs will be used to keep people and animals away from the TSF's	X	X	X	X	X	X
		Develop and implement an emergency response plan for third parties falling into or off hazardous excavations and causing injury.	X	X	X	X	X	X

		When making use of mined out areas for in-pit tailings disposal, take care to recreate the aquifers and impermeable layers so that aquifer flow is confined and blocked water in the paleo-channel aquifer does not move up through the tailings deposition zone and seep pollution into the more permeable shallow alluvial aquifer.	X	X	X			
		Operate the TSFs in accordance with their respective operating manuals.		X	X	X		
		Conduct TSF inspections in accordance to TSF design and operations manual.		X	X	X	X	X
		Reduce the ability of the tailings to emit liquid pollution by increasing the density and lowering the tailings water content.			X			
		Deposit tailings as per the TSF operating manuals			X			
		Maintain the TSF moisture levels on the beach areas to reduce the formation of dust that could be blown off site.			X			
		Conduct inspections in accordance to TSF design and operations manual on the TSFs and pipelines to check for leaks, incorrect operation, dust etc.	X	X	X	X	X	X
		Install piezometers in TSF dam wall and take in accordance to TSF design and operations manual readings to detect signs of seepage.	X	X	X			
		Contract an external environmental engineering consultancy to audit compliance with the tailings design, management and operational plan and monitor stability of the dams. This must be done on a regular basis.	X	X	X	X	X	X
		Measure evaporation from the evaporation pans situated at the TSFs.		X	X			
		Monitor slurry and decant water pipelines in accordance to TSF design and operations manual for blockages and leaks.		X	X			
		Implement planned maintenance on pipelines and TSFs and related equipment (e.g. pumps and generators).		X	X	X		
		CCD bunds must be maintained in good working order.			X			
		Clean up spills within 24 hours of the occurrence where possible and dispose of the material in the operational TSF.	X	X	X	X	X	X
		In the event of major spills, rehabilitate the contaminated area once the spill has been cleaned up.		X	X	X	X	X
		In-pit tailings must be covered with a properly selected succession of layers with different hydraulic properties that prevent flood water to interact with in-pit tailings.	X	X	X			
		Install piezometers in the tailings and paleo-channel separately to measure water levels (recharge) and analyse water for pollutants.	X	X	X			
		Establish a cut-off trench at the point where the Groundwater and Surface water and Groundwater channels meet to act as a warning system for seepage impacts moving beyond the operational area.	X	X	X			
		Ensure that all contaminated water is captured, and pumped back to the process pond or TSF.		X	X	X	X	X
		Ensure that topsoil contaminated by seepage water is not used for rehabilitation but discarded as waste into TSF			X	X	X	X

MINERAL WASTE MANAGEMENT AND MITIGATION PLAN								
		Ensure that the TSF can accommodate a 1:100 year rainstorm event and that a freeboard of 1 meter is allowed in the construction.	X	X	X	X	X	X
		Install fall-out dust monitors on and around the TSFs and monitor dust levels.		X	X		X	X
		Develop a rehabilitation strategy and plan for TSFs.	X					X
		Manage and regularly update the Groundwater model to develop a better understanding of the hydrological (surface and ground water) environment, to simulate long term behaviour including geochemical and to assist with decision making.		X	X	X		
		Ensure that rehabilitation of TSFs commences during the operational phase.	X	X	X			
		Ensure that monitoring of TSFs continues post closure or until rehabilitation completion criteria have been achieved.					X	X
		As part of the progressive rehabilitation ensure that the TSF's are restored in such a way that water falling on this facility is able to flow from the facility into the main washes and thus feed downstream users.	X	X	X			
		Develop a rehabilitation strategy and plan for TSF's.	X	X	X			
		Monitor Groundwater for seepage from TSFs and manage the findings accordingly.		X	X	X	X	X
		Monitor water levels in seepage monitoring boreholes to detect abnormal water flows.		X	X	X	X	X

C.2.5.5. Hazardous Material Management and Mitigation Plan

HAZARDOUS MATERIAL MANAGEMENT AND MITIGATION PLAN								
Context	Despite the fact that the potential direct and indirect impacts associated with the management of chemicals, hydrocarbons, and other hazardous material which may arise from LHU's activities, infrastructure and services were identified and assessed, no management plan was developed. During the update of this EMP the gap was identified to establish a chemicals, hydrocarbons, and other hazardous material management plan that is applicable to environmental protection. This Management Plan is applicable to all of LHU's operational activities. It covers the management of chemicals, hydrocarbons, and other hazardous material to prevent spillage and environmental contamination, secure transportation and storage, contamination investigation, site remediation and emergency response. This plan focuses on the environment and is not applicable to Occupational Health and Safety Management.							
Objective	To safely manage, purchase, store, handle and dispose Chemicals, hydrocarbons, and other hazardous material and prevent the uncontrolled release of these substance to the environment.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Hazardous Material legal and other requirements.	**<u>LHU remains committed to:</u>** • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Hazardous Material Management at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Hazardous Material Management. • Record, report and address any non–compliances with regulatory and site requirements associated with Hazardous Material Management. **<u>Relevant legal and other requirements:</u>** • Petroleum Products and Energy Act (1990) and the Petroleum Products Regulations (2000), Regulation 49 (1). • Petroleum Products and Energy Act 13 of 1990. • Regulations relating to the Health & Safety of Employees at Work (promulgated in terms of Section 101 of the Labour Act No 6 of 1992 (GN156, GG 1617 of 1 August 1997). • Road Traffic and Transport Act 22 of 1999. • Atomic Energy and Radiation Protection Act 5 2005. • Radiation Protection and Waste Disposal Regulations: Atomic Energy and Radiation Act, (No5 of 2005). • Environmental Management Act 7 of 2007. • Environmental Impact Assessment Regulations: Environmental Management Act (No7 of 2007). • Water Act 54 of 1956. • Explosives Act 26 of 1956 (and Regulations). • Hazardous Substances Ordinance 14 of 1974. • The Public Health Act, 36 of 1919 - South Africa. • Soil Conservation Act, 76 of 1969. • The Atmospheric Pollution Prevention Ordinance, 11 of 1976. • The Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal, 1989. • Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1989. • Namib Naukluft Park Permit.	**X**	**X**	**X**	**X**	**X**	**X**

		• Namibian Ports Authorities Act 2, 1994 • Dangerous Goods Act, 1992 Canada.						
Risk Management	To pro-actively identify and manage Hazardous Risks associated with LHM operation in order to prevent the uncontrolled release of these substance to the environment.	**LHU remains committed to:** • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Hazardous Material impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Hazardous Material risks. • Have a risk management register in which the identified Hazardous Material Risks are documented. • Will communicate Hazardous Material Risks to the identified • MSDS of all chemicals, hydrocarbons, and other hazardous material will be available at the appropriate location where these substances are used or stored. • All chemicals, hydrocarbons, and other hazardous material will be stored in accordance with the MSDS specifications. • All relevant workers will be trained in appropriate handling, storage and containment practices for all chemicals, hydrocarbons, and other hazardous material relevant to the role. • Record will be kept on existing inventory, storage, location, personnel training records and disposal of waste of all chemicals, hydrocarbons, and other hazardous. • All chemicals, hydrocarbons, and other hazardous material storage areas will be suitably bunded and contained to minimise the potential for leaks. • Machinery and equipment will be regularly maintained to ensure safe and effective operation, minimise breakdown and decrease the risk of contamination. • Spill kits will be available and accessible to assist with spill management and clean up. • All spills will be cleaned-up as soon as safe, weather and access permitting. • Firefighting and spill response systems will be provided. • On-site emergency response team will be trained to undertake the necessary actions to address fire and incidents that may arise with areas used for storage of chemicals, hydrocarbons, and other hazardous material. • Standard operating procedures for storage, handling and disposal of chemicals, hydrocarbons, and other hazardous material will be developed and all relevant workers will be trained accordingly.	X	X	X	X	X	X
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Hazardous Material Management.	**LHU remains committed to:** • Ensure there are adequate financial, human, technological and organisational resources to implement and maintain this Hazardous Material Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Hazardous Material Management Plan throughout the different stages of the mine operation whilst adhering to the relevant Legal and other requirements. • Assign clear responsibilities and accountabilities for Hazardous Material considering representation from across the organisational structure. Responsibilities must include tracking and reviewing progress in implementing this plan. • Assignment of clear accountabilities and responsibilities for Hazardous Material Management and for implementing the management plan on an ongoing basis under actual field conditions. • Ensure that the supervision and operation of disposal and storage facilities are commensurate with the environmental and safety hazards posed by the waste and the facility.	X	X	X	X	X	X

HAZARDOUS MATERIAL MANAGEMENT AND MITIGATION PLAN								
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) understand and manage Hazardous Material associated with their respective activities.	**LHU remains committed to**: • Provide the appropriate Hazardous Material Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also Hazardous Material management. • Provide comprehensive, Risk Base Hazardous Material Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task. • Employees (LHU and Contractors) that manage or handle hazardous waste will be appropriately trained • Have an a trained on-site emergency response team who will undertake the necessary actions to address fire and incidents that may arise with areas used for storage of chemicals, hydrocarbons, and other hazardous material	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery to in order to prevent or mitigate the uncontrolled release of these substance to the environment.	**LHU remains committed to:** • Identify environmental impact assessment throughout the different stages of the mine operation what activities, infrastructure or products result in possible Hazardous Material emergencies scenarios. • Develop, document and review effective plans, response processes and resources are available to minimise injury, property damage or harm to the environment. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations. • Ensure that spill kits will be available and accessible to assist with spill management and clean up. • Provide a Fire fighting and spill response systems. • Have an a trained om-site emergency response team who will undertake the necessary actions to address fire and incidents that may arise with areas used for storage of chemicals, hydrocarbons, and other hazardous material. • To develop, document, implement and maintain Standard operating procedures for storage, handling and disposal of chemicals, hydrocarbons, and other hazardous material will be developed and all relevant workers will be trained accordingly.	X	X	X	X	X	X
Monitoring and Measurement	To Monitor the implementation and safe use of Hazardous Material to in order to prevent or mitigate the uncontrolled release of these substance to the environment..	**LHU remains committed to**: • Undertake the required Hazardous Material Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Hazardous Material Monitoring Programme and update as deemed necessary. • Conduct inspections to: determine any signs of Hazardous Material contamination. • Inspect Hazardous Material storage areas to assess the conditions and appropriateness of storage areas. • Inspect all bunded areas regularly and each time before and after a rainfall event to assess bund capacity. • Inspect the conditions and availability of spills kits. • Ensure MSDS are available and current in the areas where Hazardous Materials are stored, used or transported and that employees can apply the content there-off. • Maintain and inspect all vehicles, plant and machinery to ensure they are not at risk or leaking or spilling Hazardous Material.	X	X	X	X	X	X

Reporting	Managing effective and on time Hazardous Material Management Reporting in accordance to Permitting, Licencing and Certification Requirements.	**LHU remains committed to:**
		• Ensure that all Hazardous Material Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Reportable events that may have catastrophic impacts Hazardous Material functionality.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Hazardous Material Monitoring will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Hazardous Material Management.
		• Identify, record and report all issue and concerns related to Hazardous Material management into a register.
			X	X	X	X	X	X

HAZARDOUS MATERIAL MANAGEMENT AND MITIGATION PLAN								
Communication and Engagement	Pro-active management of Hazardous Material information to avoid any Stakeholder and potential social risks.	**LHU remains committed to:** • Ensure that all Hazardous Material Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Hazardous Material management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Hazardous Material to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Hazardous Material Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Hazardous Material Management issues.	X	X	X	X	X	X
Hazardous Material Management	The objective of the management measures is to prevent material to prevent spillage and environmental contamination, secure transportation and storage, contamination investigation, site remediation and emergency response	MSDS of all chemicals, hydrocarbons, and other hazardous material is available at the appropriate location where these substances are used or stored.	X	X	X	X	X	X
		All chemicals, hydrocarbons, and other hazardous material are stored in accordance with the MSDS specifications.	X	X	X	X	X	X
		All relevant workers are trained in appropriate handling, storage and containment practices for all chemicals, hydrocarbons, and other hazardous material relevant to the role.	X	X	X	X	X	X
		Records are kept on existing inventory, storage, location, personnel training records and disposal of waste of all chemicals, hydrocarbons, and other hazardous	X	X	X	X	X	X
		All chemicals, hydrocarbons, and other hazardous material storage areas are suitably bunded and contained to minimise the potential for leaks.	X	X	X	X	X	X
		Machinery and equipment are regularly maintained to ensure safe and effective operation, minimise breakdown and decrease the risk of contamination.	X	X	X	X	X	X
		Spill kits are available and accessible to assist with spill management and clean up.	X	X	X	X	X	X
		All spills are cleaned-up as soon as safe, practicable and required permitting granted.	X	X	X	X	X	X
		Firefighting and spill response systems are provided.	X	X	X	X	X	X
		On-site emergency response team are trained to undertake the necessary actions to address fire and incidents that may arise with areas used for storage of chemicals, hydrocarbons, and other hazardous material.	X	X	X	X	X	X
		Standard operating procedures for storage, handling and disposal of chemicals, hydrocarbons, and other hazardous material are developed and all relevant workers are trained accordingly.	X	X	X	X	X	X
		Ensure that hazardous materials, including those brought by contractors, do not adversely impact the environment, cannot be accessed by unauthorised personnel and, based on risk, cannot come into contact with birds and other animals.	X	X	X	X	X	X
		Maintain effective containment barriers for preventing spills of hazardous material from reaching the environment. All tanks (including flow through process tanks) and drum storages containing hazardous material must have properly designed secondary containment.	X	X	X	X	X	X
		Containment drainage valves must remain closed and locked with the exception of rainwater draining events. Appropriate signage must be provided, indicating correct valve position and requirement for locks.	X	X	X	X	X	X
		Containment systems must be free from product spillage and other materials; rainwater must be removed to ensure adequate capacity is maintained.	X	X	X	X	X	X

HAZARDOUS MATERIAL MANAGEMENT AND MITIGATION PLAN								
		Measures must be in place to ensure spills from secondary containment and portable containers cannot enter sewers or any body of water or soil.	X	X	X	X	X	X
		Dispensing hazardous materials must have effective spill prevention and leak/spill detection measures in place. Construction materials must be compatible with the fluid contained in the system.	X	X	X	X	X	X
		Implement selection criteria and control procedures for third party transporters, purchasers and other recipients of hazardous materials and implement follow-up procedures for any hazardous material sent off the premises.	X	X	X	X	X	X
		Maintain spill and leakage detection equipment and emergency response plans that are adequate for the risk posed by the hazardous material to the environment and linked to the appropriate operational control and emergency response unit.	X	X	X	X	X	X
		Implement routine inspections, monitoring procedures for leaks and integrity testing for deterioration of storage tanks and pipelines with a frequency and methodology commensurate with the associated environmental hazards and local legislation.	X	X	X	X	X	X

C.2.5.6. Soil Management and Mitigation Plan

SOIL MANAGEMENT AND MITIGATION PLAN								
Context	LHU acknowledges that soil is a finite resource and a vital component of successful rehabilitation because it contains accumulated seeds, provides the growth medium to plants and hosts a wide range of vertebrates and invertebrates. It is therefore essential to prevent losses of this resource and to manage this resource correctly, because it implies the difference between rehabilitation success and failure. LHU has made a commitment, amongst others, to land use stewardship, biodiversity conservation measures and rehabilitation of disturbed areas within its mine lease. In recognition of soil as important ecological driver, soil management is elevated to a key role in the rehabilitation program at LHU. No major construction is foreseen during the current operational phase; only small-scale general construction activities are expected. Subsequently the scope of this management plan does not distinguish a pertinent construction phase, but more specifically focus on the impacts associated with the current operational and proposed decommissioning and post-decommissioning phases.							
Objective	Prevent loss of soil resources.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Soil legal and other requirements.	**LHU remains committed to:** • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Soil use and Soil quality at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Soil use and Soil quality. • Record, report and address any non–compliances with regulatory and site requirements associated with Soil use and Soil quality. **Relevant legal and other requirements** • Environmental Management Act, 7 of 2007 and its regulations. • The Minerals Policy of Namibia, 2002. • The Minerals (Prospecting and Mining) Act, and No 33 of 1992. • The Soil Conservation Act 76 of 1969 of South Africa is applicable in Namibia since 1971.	X	X	X	X	X	X
Risk Management	To pro-actively identify and manage Soil Risks associated with LHM operation in order to avoid or prevent the loss of Soil functionality and ensuring adequate soil is available for rehabilitation.	**LHU remains committed to**: • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Soil impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Soil risk. • Have a risk management register in which the identified Soil Risks are documented. • Will communicate Soil Risks to the identified • Provide awareness and training on the Soil risk to identified Stakeholders. • Develop, implement, document and review the required Soil Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Soil risks / impacts and potential deviations.	X	X	X	X	X	X

		• Mitigate and manage the impacts of soil pollution that are caused by LHU's activities by appropriate prevention and remediation measures throughout the different stages of operations in order to prevent liabilities after decommissioning. • Mitigate the potential loss of soil as a result of physical disturbance caused by LHU's activities by appropriate preventative measures throughout the different stages of operations in order to prevent liabilities after decommissioning. • Enable passive re-vegetation in areas where soil is relocated by appropriate management measures throughout the different stages of operations in order to prevent liabilities after decommissioning						
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Soil Management.	**LHU remains committed to:** • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Soil Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Soil Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) understand and manage Soil Risks (both in terms of functionality and availability) associated with their respective activities.	**LHU remains committed to:** • Provide the appropriate Biodiversity Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also biodiversity management. • Provide comprehensive, Risk Base Biodiversity Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task.	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery to minimise Soil degradation.	**LHU remains committed to:** • Identify environmental impact assessment throughout the different stages of the mine operation what activities, infrastructure or products result in possible Soil emergencies scenarios. • Develop, document and review effective plans, response processes and resources are available to minimise injury, property damage or harm to the environment. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's impact on the Soil use and Soil quality implement appropriate mitigation measures to prevent Soil degradation.	**LHU remains committed to:** • Undertake the required Soil Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Soil Monitoring and update as deemed necessary. • Conduct Soil monitoring and measurements in accordance to certificate, permit or licence conditions. • Audit conditions of the specific land disturbance clearance to ensure compliance to the specified conditions indicated in the specific clearance. • Undertake regular monitoring of soils (stockpiles, in its natural state and rehabilitated areas) to ensure effective implementation of measures. • Monitoring of topsoil – as stockpiled resource as well as applied growth medium – is done to report on passive re-vegetation and the health of natural seed banks. • Soil stockpiles are periodically monitored, especially after rain events to investigate erosion damage and to report on vegetation growth. • Rehabilitated areas covered with subsoil and topsoil are monitored as part of the progressive rehabilitation program. • The results of LHU's Soil Monitoring and Management Program will continue to be reported in the reports submitted to the identified stakeholders.	X	X	X	X	X	X

SOIL MANAGEMENT AND MITIGATION PLAN								
Monitoring and Measurement	LHU will ensure that Soil Quality and Use monitoring program is executed in accordance to the agreed commitments made whilst operating within relevant requirements.	LHU will conduct water monitoring necessary to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. This monitoring programme should be carried out to ensure objectives are being met The current Soil monitoring program will continue. The effectiveness of the LHU's Soil monitoring will be regularly assessed and the Water Management Plan will be updated as necessary. The results of LHU's water quality monitoring program will continue to be reported in the reports submitted to the identified Ministries within Government on LHU's environmental performance.						

Reporting	Managing effective and on time Soil Management Reporting in accordance to Permitting, Licencing and Certification Requirements.	**LHU remains committed to:**
		• Ensure that all Soil Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Reportable events that may have catastrophic impacts Soil functionality.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Soil Monitoring will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Soil Management.
		• Identify, record and report all issue and concerns related to Soil management into a register.
			X	X	X	X	X	X

Communication and Engagement	Pro-active management of Soil use and Soil quality information to avoid any Stakeholder and potential social risks.	**LHU remains committed to:** • Ensure that all Soil Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Soil management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Soil to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Soil Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Soil Management issues. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied	X	X	X	X	X	X
Loss of soil resources – pollution	The objective of the management measures is to prevent pollution of soil.	Ensure that all hazardous chemicals (new and used), dirty water, mineralised wastes and non-mineralised wastes are handled in a manner that they do not pollute soils.		X	X	X	X	X
		The designs of any permanent and potentially polluting structures will take consideration of the requirements for long term pollution prevention and confirmatory monitoring.	X	X	X			X
		Major spillage incidents will be handled in accordance with the LHM emergency response procedure.		X	X	X	X	X
		Prevent soil pollution from hazardous chemicals (new and used), hydrocarbons, and seepage and process water.		X	X	X	X	
		Prevent soil pollution from vehicle and equipment servicing, runoff, dirty water and effluent.	X	X	X	X	X	X
		Prevent soil pollution as a result of general construction and building activities.	X	X	X			
		Consider the prevention of potential soil pollution from structures in the design of infrastructure.	X	X	X			

SOIL MANAGEMENT AND MITIGATION PLAN								
		Prevent soil pollution from transport and storage of hydrocarbons.	X	X	X	X	X	X
		Prevent soil pollution from mineralized waste.		X	X			
		Prevent soil pollution from non-mineralized wastes	X	X	X	X	X	X
Loss of soil resources – physical disturbance	The objective of the management measures is to prevent the loss of soils and related functionality through physical disturbance, erosion and compaction	Limit the disturbance of soils to what is absolutely necessary both in terms of site clearing and in terms of on-going project development and use of vehicles.	X	X	X	X	X	X
		Where soils have to be disturbed the soil will be stripped, stored, maintained and replaced in accordance with the specifications of the Standard Operating Procedure or Standard Work Instruction.		X	X		X	
		Even though the footprint of the mineralised waste facilities will never be rehabilitated, strip and store some topsoil from these areas because this valuable resource can be used elsewhere on the site for rehabilitation.		X	X			
		As part of closure planning, the designs of any permanent structures will take into consideration the requirements for long term erosion prevention.	X	X	X		X	X
Topsoil stockpiling / management	The objective of the management measures is to ensure that all topsoil stripping, stockpiling and replacement operations will be undertaken in a manner that limits impacts on the soil functionality and to ensure it can be used for rehabilitation as and when required.	Limit the disturbance of soils to what is absolutely necessary. Stripping will only occur where soils are to be disturbed by activities described in the approved EIA's and where clearly defined end rehabilitation use for the stripped soil has been identified.		X	X		X	X
		Stockpiling areas will be identified as far as practically possible in close proximity to the source of the soil.	X	X	X			
		Soil stockpiles will be demarcated, and clearly marked to identify both the soil type and the intended area of rehabilitation.		X	X			
		Report biannually on the tonnes of topsoil stockpiles stored and used. Indicate where these piles are located.		X	X			
		LHM should initiate trial studies on the use of fertilizers and certain erosion control measures as effective soil management tools.		X	X			
		Options for preventing erosion of stockpiles could include recreating the crusty layer, rock cladding or establishment of vegetation such as the Vetivier grass.		X	X			
		Investigate the possibility of establishing storm water diversion berms to prevent run off erosion around stockpiles.	X	X	X		X	X
		Soil stockpiles heights will be restricted where possible to <1.5m.		X	X			
		Where stockpiles higher than 1.5m cannot be avoided, these will be benched to a maximum height of 15m. Each bench should ideally be 1.5m high and 2m wide.		X	X			
		For storage periods greater than 3 years, erosion control is essential, and should be encouraged using the most effective method identified during the trial/pilot studies. The stockpile sides should as far as practically possible be stabilised as a slope of 1 in 6 or less.		X	X		X	X
		No waste material will be placed on the soil stockpiles.	X	X	X	X	X	X
		Equipment movement on top of the soil stockpiles will be limited.	X	X	X	X	X	X

C.2.5.7. Biodiversity Management and Mitigation Plan

BIODIVERSITY MANAGEMENT AND MITIGATION PLAN								
Context	Amongst others, LHU has made a commitment to land use stewardship, biodiversity conservation measures and rehabilitation of disturbed areas within its mine lease. Committed to comply with all applicable environmental and other regulatory legislation, LHU is dedicated to implement appropriate measures to avoid, mitigate, manage and remediate negative impacts and to maximize positive impacts on biodiversity within its mine lease in order to leave no liability to the company, government and community behind. LHU acknowledges that, to comprehend biodiversity in totality one needs to understand the variety of species, different habitats, the spatial arrangements and patterns that constitutes the species and habitats, and all the factors that affect the species, the habitats and ecological process all together. LHU recognizes that its operations can have potential impacts on biodiversity, more so in an unmanaged scenario. To understand biodiversity at LHU, all of its components are appreciated – also beyond the boundaries of the mine lease. The purpose of this plan is to describe LHU's approach towards biodiversity management during the operational, decommissioning and post-decommissioning phase in order to ensure the objectives of the policy statement are met. No major construction is foreseen during the current operational phase; only small-scale general construction activities are expected. Subsequently the scope of this management plan does not distinguish a pertinent construction phase, but more specifically focus on the impacts associated with the current operational and proposed decommissioning and post-decommissioning phases.							
Objective	Prevent or limit the loss of biodiversity as a result of physical destruction, restriction of water as ecological driver and habitat fragmentation and general disturbance.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Biodiversity legal and other requirements.	**<u>LHU remains committed to</u>**: • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Biodiversity at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Biodiversity. • Record, report and address any non–compliances with regulatory and site requirements associated with Biodiversity. .**<u>Relevant legal and other requirements</u>** • Constitution of the Republic of Namibia • Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • The Minerals (Prospecting and Mining) Act, No 33 of 1992. • Nature Conservation Ordinance No. 4 of 1975 and the Forest Act 12 of 2001, as amended in 2005. • Forestry Act No. 72 of 1968. • The Convention on Biological Diversity. • Strategic Environmental Management Plan (Uranium) • Equator Principles (Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management,)	X	X	X	X	X	X

BIODIVERSITY MANAGEMENT AND MITIGATION PLAN								
Risk Management	To pro-actively identify and manage Biodiversity Risks associated with LHM operation in order to avoid or prevent Biodiversity degradation.	**LHU remains committed to**: • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Biodiversity impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Biodiversity risk. • Have a risk management register in which the identified Biodiversity Risks are documented. • Will communicate Biodiversity Risks to the identified • Provide awareness and training on the Biodiversity risk to identified Stakeholders. • Develop, implement, document and review the required Biodiversity Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Biodiversity risks / impacts and potential deviations.	X	X	X	X	X	X
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Biodiversity Management.	**LHU remains committed to**: • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Biodiversity Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Biodiversity Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of associated with Biodiversity Management.	**LHU remains committed to:** • Provide the appropriate Biodiversity Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also biodiversity management. • Provide comprehensive, Risk Base Biodiversity Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task.	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery to minimise Biodiversity degradation.	**LHU remains committed to:** • Identify environmental impact assessment throughout the different stages of the mine operation what activities, infrastructure or products result in possible Biodiversity emergencies scenarios. • Develop, document and review effective plans, response processes and resources are available to minimise injury, property damage or harm to the environment. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's impact on the ecosystem services and surrounding environment and identify and implement appropriate mitigation measures to prevent and avoid long term impacts.	**LHU remains committed to:** • Undertake the required Biodiversity Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Biodiversity Monitoring and update as deemed necessary. • Conduct Biodiversity monitoring and measurements in accordance to certificate, permit or licence conditions. • Undertake baseline monitoring prior to any site disturbance. • Confirmatory surveys and focused monitoring after an above-normal rainy season. • Audit conditions of the specific land disturbance clearance to ensure compliance to the specified conditions indicated in the specific clearance.	X	X	X	X	X	X

		• Annually inspect the state of undisturbed habitats, particularly irreplaceable or highly sensitive habitats is inspected. The health of key plant species, for example Acacia erioloba in the Gawib River, is indicative of the state of such habitats. • Inspect any site prior to disturbance to assess the Physical and Biodiversity vulnerability to ensure future references for rehabilitation. • Inspect of topsoil stockpiles after rain events to report on passive re-vegetation and erosion. • Record and report as required all animal re-locations and deaths. • Record observation of erosion and the presence of alien invasive species • The results of LHU's Biodiversity Monitoring and Management Program will continue to be reported in the reports submitted to the identified stakeholders.						

Reporting	Managing effective and on time Biodiversity Reporting in accordance to Permitting, Licencing and Certification Requirements.	**LHU remains committed to:**
		• Ensure that all Biodiversity Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Reportable Fauna deaths.
		  ○ Reportable events that may have catastrophic impacts on the Biodiversity.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Biodiversity Monitoring will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Biodiversity Management.
		• Identify, record and report all issue and concerns related to Biodiversity management into a register.
			X	**X**	**X**	**X**	**X**	**X**

Communication and Engagement	Pro-active management of Biodiversity information to avoid any Stakeholder and potential social risks.	**LHU remains committed to:** • Ensure that all Biodiversity Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Biodiversity management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Biodiversity to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Biodiversity Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Biodiversity Management issues. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied	**X**	**X**	**X**	**X**	**X**	**X**
Managing the physical destruction of biodiversity,	The objective of the management measures is to prevent or limit the unacceptable loss of biodiversity and related functionality through physical disturbance. Given that the main components of the mining project are already approved and implemented,	Prior to entering into an undisturbed area, ensure that the planned activity / infrastructure is assessed in terms of land disturbance.		**X**	**X**		**X**	
		Design construction footprints as small as possible, mark out all construction footprints and stay inside design boundaries.	**X**		**X**		**X**	**X**
		Inspect areas disturbed by operational activities and update land disturbance records as part of Land Use Report.		**X**	**X**	**X**	**X**	
		Identify areas disturbed as a result of construction for alternative land use or progressive rehabilitation.		**X**	**X**		**X**	**X**

	there may be some difficulty in achieving this objective, although there is still opportunity to plan for those sections of the mine that are yet to take place.	Restrict access and encroachment of infrastructure as far as possible into irreplaceable and sensitive habitats (e.g. washes and granite outcrops) by means of appropriate measures (buffer zones, fencing, and signage).	X	X	X			
		Consider and avoid as far as possible sensitive areas (e.g. washes, granite outcrops) and allow buffer zones (when mining activities and landforms are planned).	X	X	X	X	X	X
		Delineate and assess proposed areas to be disturbed by mining activities.	X	X	X			
		Design mining footprint as small as possible in accordance with land disturbance approval and stay inside design boundaries.	X	X	X			X
		Limit off-road driving, use existing servitudes as far as possible, mark access tracks / roads, use existing disturbed areas for vehicle movement, control access roads with signboards and patrol.	X	X	X	X	X	X
Managing the restriction of water as an ecological driver.	Prevent or limit the unacceptable loss of biodiversity and related functionality as a result of restriction of water as an ecological driver.	Prevent over-abstraction of Groundwater aquifer of the Swakop River.		X	X			
		Monitor the water table in order to avoid a decrease in the availability of water downstream due to interference and prevention of recharge.		X	X	X		
		Avoid excessive pooling of water and impeding of surface flow as a result of construction and placement of infrastructure (e.g. roads) and landforms (stockpiles, WRDs, aboveground TSF).		X	X			
		Avoid and minimize impacts on ephemeral pools; manage and remediate disturbed ephemeral pools.		X	X			
		Avoid fragmentation, impeding and pooling of surface flow in drainage channels as a result of placement of infrastructure in drainage lines.	X	X	X			
		Prevent increased soil erosion due to alteration of surface flow.	X	X	X		X	X
		Prevent blocking or pollution of drainage lines nearby the Processing Plant.	X	X	X	X	X	X
		Clean soil diversion measures are provided around infrastructure so that clean Soil flow is not restricted / captured.	X	X	X			
		Divert clean storm water from dirty storm water through appropriate measures e.g. berms, channels. Trenches.		X	X	X	X	
		Avoid placement of pits and WRDs in drainage channels, in particular in irreplaceable and sensitive habitats associated with Gawib River (e.g. Camel thorn stands).	X	X	X		X	X
		As far as possible avoid disturbance of irreplaceable and sensitive habitats associated with Gawib River by redesign of the pit shapes.	X	X	X		X	X
		Progressively restore the hydrological regime (surface, shallow and deep) so that recharge of the drainage system can occur and Soil will again flow through the main washes.		X	X			
		As part of closure planning the design, placement and rehabilitation of mined-out pits and remaining aboveground landforms take into consideration the permanent impacts such as long term erosion and runoff discharge into the main washes.	X					X
		Avoid the introduction and presence of animals, birds and insects at open water sources through appropriate fencing.	X	X	X		X	X

BIODIVERSITY MANAGEMENT AND MITIGATION PLAN								
Managing the loss of biodiversity caused by general disturbance.	Prevent or limit the unacceptable loss of biodiversity and related functionality as a result of general disturbance.	Facilitate applied research and confirmatory surveys focusing on sensitive, significant and indicator species, vulnerable sites, inter-annual variation, changes in species composition, diversity and patterns.			X		X	X
		Inspect the state of undisturbed habitats periodically, particularly irreplaceable and highly sensitive habitats.		X	X	X	X	X
		Establish and strengthen cooperative relations with appropriate institutions and collaborative agencies on arid biodiversity research.		X	X		X	X
		Facilitate confirmatory surveys of control sites and research representative of areas under rehabilitation (i.e. areas of similar biodiversity attributes that will not be disturbed) to assist in the setting of rehabilitation targets.		X	X		X	X
		Prevent illegal killing, collection and hunting of species and the collection of firewood by keeping people out of restricted areas.	X	X	X	X	X	X
		Prevent road kills by enforcing driving within speed limits within the park.	X	X	X	X	X	X
		Only allow authorized people on site to prevent collection and / or poaching of species.	X	X	X	X	X	X
		Prevent increased erosion, impeding of surface flow and pooling by infrastructure (e.g. roads) and landforms (e.g. WRDs) through appropriate measures (e.g. diversion berms, profiling, contouring) to limit the alteration in run-off, loss of topsoil and uprooting of plants.	X	X	X		X	X
		Identify wildlife corridors; avoid and mitigate impacts on migration routes during operations and rehabilitate disturbed migration routes during decommissioning.	X	X	X		X	X
		Ensure that the use of artificial light is kept to a minimum and where it is required, yellow lighting is used.	X	X	X	X	X	X
		Ensure that dust control measures are implemented.	X	X	X	X	X	X
		Ensure that air pollution prevention measures are implemented.	X	X	X	X	X	X
		Ensure that alien invasive species are not introduced as a result of LHU's operational activities.	X	X	X	X	X	X

C.2.5.8. Noise and Vibration Management and Mitigation Plan

NOISE AND VIBRATION MANAGEMENT AND MITIGATION PLAN								
Context	There is a range of construction, operation and decommissioning activities that have the potential to generate noise and cause related pollution. Noise pollution will have different impacts on different receptors because some are very sensitive to noise and others are not. For example, mine workers in general do not expect an environment free of mine related noise and so they will not be sensitive to environmental noise pollution at work. In contrast, visitors to the Namib Naukluft Park are likely to be sensitive to unnatural noises and so any change to ambient noise levels because of mine related noise will have a negative impact on them and their wilderness experience. From observations in the field, the diesel generator(s) at the Swakop River boreholes emit noise pollution that will be heard by visitors in the surrounding area and visitors to Bloedkoppie will hear existing blasting noise and may hear noise from other LHM activities depending on the wind direction. The Bloedkoppie receptor site will experience ongoing and possibly even increased noise pollution during the operational phase because of the plan to mine in the eastern area of the ML, which is approximately 1km from Bloedkoppie.							
Objective	To minimise noise impacts resulting from LHU mines operation on the surrounding environment and communities							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Noise and Vibration legal and other requirements.	**LHU remains committed to:** • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Noise and Vibration at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Noise and Vibration. • LHU will design, construct and operate its facilities in accordance with appropriate practices and ensure that construction meets relevant Standards and regulatory requirements and addresses all the identified significant risks. • Record, report and address any non–compliances with regulatory and site requirements associated with Noise and Vibration. .**Relevant legal and other requirements:** • Namibia has no environmental noise legislation. • Environmental noise guidelines form IFC of the World Bank.	X	X	X	X	X	X
Risk Management	To pro-actively identify and manage Noise and Vibration Risks associated with LHM operation in order to avoid or prevent noise and vibration impacts resulting from LHU mines operation on the surrounding environment and communities.	**LHU remains committed to:** • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Noise and Vibration impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Noise and Vibration risk. • Have a risk management register in which the identified Noise and Vibration Risks are documented. • Will communicate Noise and Vibration Risks to the identified • Provide awareness and training on the Noise and Vibration risk to identified Stakeholders. • Develop, implement, document and review the required Noise and Vibration Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Noise and Vibration risks / impacts and potential deviations.	X	X	X	X	X	X

		• Employ environmental aspects identification and change management procedures to ensure that new developments, existing activities and facilities and substantive changes to existing facilities. • Identify which components of the facility and which activities are the key contributors to external noise and vibration levels; understand the generation and propagation of noise and vibration and evaluate the potential environmental impact under a range of meteorological and operating conditions. • Adopt a hierarchy of noise and vibration controls, with engineering or design controls for noise sources being the first option implemented. If due to safety reasons this is not permissible consider other control processes. • Incorporate and maintain noise and vibration control requirements into design and operational criteria for relevant exploration and mining activities, including drilling and blasting, processing activities and new facilities. • Ensure that construction meets regulatory requirements and addresses all the identified hazards/risks. • Ensure that operation of the facility conforms to approved design criteria and operational procedures and that precautionary measures are put in place to minimise noise and vibrations impacts on the surrounding environment and communities. • LHU will ensure where applicable the required Noise and Vibration Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers are developed and documented to address significant Noise and Vibration risks / impacts and potential deviations. • Plant and equipment are maintained to meet design descriptions and specifications. • Noise and Vibration Risks / impacts are identified, address and controlled in accordance to Paladin Risk Management System. • Identify which components of the facility and which activities are the key contributors to external noise and vibration levels; understand the generation and propagation of noise and vibration and evaluate the potential environmental impact under a range of meteorological and operating conditions. • Incorporate noise and vibration performance criteria into purchasing requirements for relevant, equipment and machinery.						
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Noise and Vibration Management.	**LHU remains committed to:** • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Noise and Vibration Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Noise and Vibration Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of risks associated with Noise and Vibration Management.	**LHU remains committed to:** • Provide the appropriate Noise and Vibration Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also Noise and Vibration management. • Provide comprehensive, Risk Base Noise and Vibration Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task.	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery to minimise noise and vibration impacts resulting from LHU mines operation on the surrounding environment and communities.	**LHU remains committed to:** • Identify environmental impact assessment throughout the different stages of the mine operation what activities, infrastructure or products result in possible Noise and Vibration emergencies scenarios. • Develop, document and review effective plans, response processes and resources are available to minimise injury, property damage or harm to the environment. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X

NOISE AND VIBRATION MANAGEMENT AND MITIGATION PLAN								
Monitoring and Measurement	To evaluate LHU's impact on the on the surrounding environment and communities in order to minimise noise and vibration impacts.	**LHU remains committed to:** • Undertake the required Noise and Vibration Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Noise and Vibration Monitoring and update as deemed necessary. • Conduct Noise and Vibration monitoring and measurements in accordance to certificate, permit or licence conditions. • The results of LHU's Noise and Vibration Monitoring and Management Program will continue to be reported in the reports submitted to the identified stakeholders.	**X**	**X**	**X**	**X**	**X**	**X**

Reporting	Managing effective and on time Noise and Vibration Reporting in accordance to Permitting, Licencing and Certification Requirements.	**LHU remains committed to:**
		• Ensure that all Noise and Vibration Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Noise and Vibration Monitoring Reporting will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Noise and Vibration Management.
		• Identify, record and report all issue and concerns related to Noise and Vibration management into a register.
			X	**X**	**X**	**X**	**X**	**X**

Communication and Engagement	Pro-active management of Noise and Vibration to ensure zero off-site complaints.	**LHU remains committed to:** • Ensure that all Noise and Vibration Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Noise and Vibration management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Noise and Vibration to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Noise and Vibration Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Noise and Vibration Management issues.	X	X	X	X	X	X
Remote noise and vibration pollution	The objective of the management measures is to limit excessive noise and vibration pollution	LHU will document and investigate all registered complaints and make efforts made to address the area of concern where possible.	**X**	**X**	**X**	**X**	**X**	**X**
		As a general rule, the activities (i.e. blasting) most likely to cause noise pollution impacts should be restricted to daytime activities.		**X**	**X**		**X**	
		All registered complaints will be documented, investigated and efforts made to address the area of concern where possible.	**X**	**X**	**X**	**X**	**X**	**X**

C.2.5.9. Air Quality Management and Mitigation Plan

AIR QUALITY MANAGEMENT AND MITIGATION PLAN								
Context	There are a number of sources in all phases that have the potential to pollute the air. In the construction and decommissioning phases these potential pollution sources are temporary in nature, usually existing for a few weeks to a few months. The operational phase present more long term potential sources and the post-decommissioning phase will present final land forms that may have the potential to pollute the air through long term wind erosion. Specialist studies showed that the more significant emissions are inhalable particulate matters less than 10 microns in size (PM10), larger total suspended particulates (TSP) and radio-active component of both PM10 and TSP. There are also limited gas emissions to be managed. The relevant receptor point that was considered is Bloedkoppie (off-site), a camping place in the NNNP where tourists may overnight. This plan excludes all radiological dust and all employee health issues (stemming from exposure to air emissions and dust) and only address issues relating to the ecosystem							
Objective	Prevent or minimise any air quality impacts at the location of identified sensitive receptors							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with all relevant Air Quality legal and other requirements.	**<u>LHU remains committed to</u>**: • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Air Quality at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Air Quality. • Record, report and address any non–compliances with regulatory and site requirements associated with Air Quality. • Design, construct and operate its facilities in accordance with appropriate practices and ensure that construction meets relevant Standards and regulatory requirements and addresses all the identified significant risks • Demonstrate that, under normal and worst case operating conditions and adverse meteorological conditions, emissions from the operation, current or after a modification, will not cause violation of regional or national air quality regulations, internally derived air quality criteria, and/ or licence conditions **<u>Relevant legal and other requirements</u>** • The Minerals (Prospecting & Mining) Act, No 33 of 1992 • Health Act, 21 of 1988 • Road Traffic and Transport Act, 22 of 1999 • Atomic Energy and Radiation Protection Act, 5 of 2005 • The Atmospheric Pollution Prevention Ordinance, 11 of 1976 • United Nations Framework Convention on climate change, 1992 • The Montreal Protocol on substances that deplete the Ozone Layer, 1987 • Vienna Convention for the protection of the ozone layer, 1985 • Namib Naukluft Park Permit Conditions	X	X	X	X	X	X

AIR QUALITY MANAGEMENT AND MITIGATION PLAN								
Risk Management	Prevent or minimise any air quality impacts at the location of identified sensitive receptors	**LHU remains committed to:** • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Air Quality impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Air Quality risk. • Have a risk management register in which the identified Air Quality Risks are documented. • Will communicate Air Quality Risks to the identified • Provide awareness and training on the Air Quality risk to identified Stakeholders. • LHU will identify all significant pollutant emission sources (e.g. Criteria pollutants, other toxic air pollutants, radon and radionuclides and Fugitive and point source emissions) generated by its activities and products. • LHU will after pollutant emissions and the sources have been identified, determine the impacts and risks associated with these pollutants. • LHU will minimise and manage pollutant emissions by implementing appropriate procedures and control technologies to minimise potential adverse impacts on the environment and people's health • Develop, implement, document and review the required Air Quality Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Air Quality risks / impacts and potential deviations.	X	X	X	X	X	X
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Air Quality Management.	**LHU remains committed to:** • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Air Quality Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Air Quality Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of associated with Air Quality Management.	**LHU remains committed to:** • Provide the appropriate Air Quality Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also Air Quality management. • Provide comprehensive, Risk Base Air Quality Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task.	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery from abnormal Air Quality emission and dispersion conditions.	LHU remains committed to: • Identify throughout the different stages of the mine operation what activities, infrastructure or products may result in possible abnormal Air Quality emission and dispersion conditions. • Prepare emergency procedures to respond to emergency situations, abnormal emission and dispersion conditions, and exceedance of air quality criteria, including immediate measures to protect community health. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's impact on the Air Quality and identify and implement appropriate	LHU remains committed to: • Undertake the required Air Quality Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Air Quality Monitoring and update as deemed necessary.	X	X	X	X	X	X

	mitigation measures to prevent and avoid long term impacts.	• Conduct Air Quality monitoring and measurements in accordance to certificate, permit or licence conditions. • Undertake baseline monitoring prior to any site disturbance. • Monitoring of wind speed, wind direction, rainfall, temperature and evaporation will be continued. The weather station instrument will be calibrated as per requirements and all monitoring equipment will be maintained for acceptable data quality. • The results of LHU's Air Quality Monitoring and Management Program will continue to be reported in the reports submitted to the identified stakeholders.						

Reporting	Managing effective and on time Air Quality Reporting in accordance to Permitting, Licencing and Certification Requirements.	LHU remains committed to:
		• Ensure that all Air Quality Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Reportable events that may result in abnormal Air Quality emission and dispersion conditions.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Air Quality Monitoring will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Air Quality Management.
		• Identify, record and report all issue and concerns related to Biodiversity management into a register.
			X	X	X	X	X	X

Communication and Engagement	Pro-active management of Air Quality information to avoid any Stakeholder and potential social risks.	LHU remains committed to: • Ensure that all Air Quality Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Air Quality management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Air Quality to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Air Quality Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Air Quality Management issues. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied	X	X	X	X	X	X
Dust – non-radiological	The objective of the management measures is to prevent unacceptable air quality related pollution impacts	Suitable dust suppressant material will be applied continue to be applied on the roads (brine and where not suitable chemical surfactants will be added to the water to improve the control efficiency (currently Dust-A-Side is applied).		X	X		X	X
		Adhere to speed limits on roads.	X	X	X	X	X	X
		Dust suppressant (water spray) is applied at the front-end of the Processing Plant to reduce dust emissions from the plant.	X	X	X	X	X	X
		Minimise surface of disturbance to the area for mining activities and rehabilitate as practicable.	X	X	X	X	X	X
		The number of roads are restricted to a minimum. Once a road is no longer required, it is barricaded and rehabilitated.	X	X	X		X	X
		LHM must continue to measure on-site meteorological data.	X	X	X	X	X	X

		As part of closure planning the designs of any permanent and potentially polluting structures will, on the basis of impact modelling, incorporate measures to address long term pollution prevention and confirmatory monitoring.		X	X			
Gaseous emissions	The objective of the management measures is to minimise Greenhouse Gas emissions.	Update the Greenhouse Gas emissions inventory and calculate LHMs annual emission of greenhouse gases.	X	X	X	X	X	X
		Calculate LHM's annual contribution to Greenhouse Gas emissions.	X	X	X	X	X	X
		Investigate ways to decrease LHMs emission of Greenhouse Gases.	X	X	X			

C.2.5.10. Visual Management and Mitigation Plan

VISUAL MANAGEMENT AND MITIGATION PLAN								
Context	The purpose of this plan is to describe LHU's approach towards the management of visual impacts during the operational, decommissioning and post-decommissioning phase in order to ensure the objectives of the policy statement are met. No major construction is foreseen during the current operational phase; only small-scale general construction activities are expected. Subsequently the scope of this management plan does not distinguish a pertinent construction phase, but more specifically focus on the impacts associated with the current operational and proposed decommissioning and post-decommissioning phases. The area under discussion focuses on the wider landscape, which stretches beyond the boundaries of the mine lease. The sense of place is primarily based on the lack of human activity and natural structures, coupled with a sense of remoteness and rugged beauty of the wider landscape of the northern parts of the Namib-Naukluft National Park. LHU recognizes that a number of its activities and associated infrastructure can have potential visual impacts in an unmanaged scenario during all phases of the Life of Mine. Cumulative impacts, i.e. the summation of visual effects from the changes that a project brings in conjunction with the past, present and foreseeable conditions, are the highest during the operational phase, are expected to remain high during decommissioning but will reduce dramatically during the post-decommissioning phase. With effective implementation, mitigation and management measures could reduce the impact to moderate during the operational and decommissioning phases.							
Objective	The primary objective of this Visual management plan is to avoid or reduce the potential adverse effects on landscape character and visual receptors.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with with lighting and visual amenity approval conditions.	**LHU remains committed to:** • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Visual at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Visual. • Record, report and address any non–compliances with regulatory and site requirements associated with Visual. • Design, construct and operate its facilities in accordance with appropriate practices and ensure that construction meets relevant Standards and regulatory requirements and addresses all the identified significant risks **Relevant legal and other requirements** • The Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • The Minerals (Prospecting and Mining) Act, No 33 of 1992. • Namib Naukluft Park Permit Conditions	X	X	X	X	X	X
Risk Management	Prevent or or reduce the potential adverse effects on landscape character and visual receptors.	**LHU remains committed to:** • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Visual impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the risk associated with Visual management. • Have a risk management register in which the identified Visual Risks are documented. • Provide awareness and training on the Visual risk to identified Stakeholders.	X	X	X	X	X	X

VISUAL MANAGEMENT AND MITIGATION PLAN								
		• Develop, implement, document and review the required Visual Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Visual risks / impacts and potential deviations.						
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Visual Management.	**LHU remains committed to:** • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Visual Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Visual Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of Risks associated with Visual Management.	**LHU remains committed to:** • Provide the appropriate Visual Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also Visual management. • Provide comprehensive, Risk Base Visual Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task.	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery from adverse effects on landscape character and visual receptors.	**LHU remains committed to:** • Identify throughout the different stages of the mine operation what activities, infrastructure or products may result in adverse effects on landscape character and visual receptors. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's impact on the surrounding landscape and identify and implement appropriate mitigation measures avoid or reduce the potential adverse effects on landscape character and visual receptors.	**LHU remains committed to:** • Undertake the required Visual Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Visual Monitoring and update as deemed necessary. • Conduct Visual monitoring and measurements in accordance to certificate, permit or licence conditions. • The results of LHU's Visual Monitoring and Management Program will continue to be reported in the reports submitted to the identified stakeholders. • Monitor and measure the location, volume and surface areas of waste rock dumps and stockpiles. • Monitor and measure disturbance and rehabilitation, biodiversity and soil management. • Monitor the Rehabilitated areas covered with subsoil and topsoil are monitored as part of the progressive rehabilitation program.	X	X	X	X	X	X

Reporting	Managing effective and on time Visual Reporting in accordance to Permitting, Licencing and Certification Requirements.	**LHU remains committed to:**
		• Ensure that all Visual Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ The location, volume and surface areas of waste rock dumps and stockpiles are included in biannual.
		  ○ Land use reporting include records on disturbance and rehabilitation, biodiversity and soil management.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Visual Monitoring will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Visual Management.
		• Identify, record and report all issue and concerns related to Visual management into a register.
			X	X	X	X	X	X

VISUAL MANAGEMENT AND MITIGATION PLAN								
Communication and Engagement	Pro-active management of Visual information to avoid any Stakeholder and potential social risks.	**LHU remains committed to:** • Ensure that all Visual Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Visual management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Visual to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Visual Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Visual Management issues. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied.	X	X	X	X	X	X
Managing Visual disturbance	The objective of the management measures is to limit excessive visual impacts.	The minimum amount of existing vegetation and topsoil will be removed from construction areas. Ensure, wherever possible, that existing vegetation is retained and incorporated in to the site design. Removal of vegetation will be done in a natural manner, avoiding harsh straight lines.		X	X			
		Conduct topographical sculpting as part of rehabilitation so that the permanent structures blend in with the natural topography of the surrounding area.		X	X			X
		Reconstruct landscapes to match pre mining landscapes so that they become ecologically functioning units and blend in with similar landscape units.		X	X			X
		In the shaping of any structures that will remain after closure, harsh, angular and steep slopes will be avoided and care should be taken to integrate these structures into the surrounding landscape.		X	X			X
		Rehabilitation and restoration of disturbed areas should be undertaken progressively.		X	X		X	X
		Remove all above ground infrastructure and rehabilitate all disturbed areas including roads.					X	X
		Shape Waste Rock Dumps so that they become ecologically functioning units and blend in with similar landscape units.		X	X		X	X
		Land disturbance should be limited to what is absolutely necessary.	X	X	X	X	X	X
		Where practical/possible, buildings and large equipment should be painted with colours that reflect natural colours of the surrounding landscape. Avoid the use of pure whites and blacks.	X	X	X	X	X	X
		Manage all dust plume sources with dust suppressants to limit visual intrusion by dust in line with the air quality MMP.	X	X	X	X	X	X
		The use of light is kept to a minimum and where it is required, yellow lighting is used where possible and vertebrates are kept away from the area around the lights with appropriate fencing where possible;	X	X	X	X	X	X
		Avoid the use of Standard Security high pole flood lights.	X	X	X	X	X	X
		Prevent littering.	X	X	X	X	X	X

VISUAL MANAGEMENT AND MITIGATION PLAN								
		Avoid constructing Waste Dumps and Low-grade Stockpiles in areas where it is not possible to contour and shape them to fit into their surroundings. As far as possible backfill waste into mined out pits and locate stockpiles in sterilised sections of the pits.	X	X	X		X	X
		Consider visual impacts when planning location of Dumps and Stockpiles.	X	X	X			X
		The access route to Tinkas Valley should be re-routed – subject to approval from MET (P&W) at the time when mining activities move towards the eastern side of the ML.	X	X	X		X	X
		To reduce potential glare the use of bare or shiny metal on plant and buildings should be avoided.	X	X	X	X	X	X
		Remaining Waste Rock Dumps are profiled to ensure that they are not visually obtrusive – harsh, angular and steep slopes and colour contrasts are avoided.		X	X		X	X
		Where practical and possible, buildings and large structures are painted in colours that reflect the natural colours of the surrounding landscape.	X	X	X	X	X	X

C.2.5.11. Archaeology Management and Mitigation Plan

ARCHAEOLOGY MANAGEMENT AND MITIGATION PLAN								
Context	There are a number of activities/infrastructure in all phases that have the potential to damage archaeological resources.							
Objective	Prevent the loss of archaeological sites and related historical information							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with National Heritage Act (27 of 2004) and relevant Archaeological approval conditions.	**LHU remains committed to:** • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Archaeological at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Archaeological. • Record, report and address any non–compliances with regulatory and site requirements associated with Archaeological. • Design, construct and operate its facilities in accordance with appropriate practices and ensure that construction meets relevant Standards and regulatory requirements and addresses all the identified significant risks **Relevant legal and other requirements**: • The Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • The Minerals (Prospecting and Mining) Act, No 33 of 1992. • The National Heritage Act (27 of 2004). • Namib Naukluft Park Permit Conditions.	X	X	X	X	X	X
Risk Management	Prevent or reduce the potential adverse effects that LHU's operation may have a negative effect on the wider landscape and its archaeological sites.	**LHU remains committed to:** • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Archaeological impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the risk associated with Archaeological management. • Have a risk management register in which the identified Archaeological Risks are documented. • All mining and related development are subject to archaeological assessment and no unauthorized archaeological impacts should occur. • Identify the location of archaeological sites within the lease area and on the nearby surrounding land. • Land disturbance is limited to what is absolutely necessary – in compliance to 2011 EIA report. • Provide awareness and training on the Archaeological risk to identified Stakeholders. • Develop, implement, document and review the required Archaeological Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Archaeological risks / impacts and potential deviations.	X	X	X	X	X	X

ARCHAEOLOGY MANAGEMENT AND MITIGATION PLAN								
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Archaeological Management.	**LHU remains committed to:** • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Archaeological Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Archaeological Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of Risks associated with Archaeological Management.	**LHU remains committed to:** • Provide the appropriate Archaeological Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also archaeological management. • Provide comprehensive, Risk Base Archaeological Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task. • All employees (LHU and Contractors) are continuously educated on the importance of preserving archaeological sites.	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery from a negative effect on the wider landscape and its archaeological sites.	**LHU remains committed to:** • Identify throughout the different stages of the mine operation what activities, infrastructure or products may result in adverse effects on landscape character and visual receptors. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's impact on the wider landscape and its archaeological sites. Identify and implement appropriate mitigation measures to avoid or reduce the potential negative effect on the wider landscape and its archaeological sites	**LHU remains committed to:** • Undertake the required Archaeological Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Archaeological Monitoring and update as deemed necessary. • Conduct Archaeological monitoring and measurements in accordance to certificate, permit or licence conditions. • The results of LHU's Archaeological Monitoring and Management Program will continue to be reported in the reports submitted to the identified stakeholders. • Monitor and measure the location, volume and surface areas of waste rock dumps and stockpiles. • Monitor and measure disturbance and rehabilitation, biodiversity and soil management. • Monitor the Rehabilitated areas covered with subsoil and topsoil are monitored as part of the progressive rehabilitation program.	X	X	X	X	X	X

Reporting	Managing effective and on time Archaeological Reporting in accordance to Permitting, Licencing and Certification Requirements.	**LHU remains committed to:**
		• Ensure that all Archaeological Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.).
		• Any complaints will be documented in LHU's complaints register, investigated and reported to LHU's MD and the complainant.
		• All internal Archaeological Monitoring will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Archaeological Management.
			X	X	X	X	X	X

ARCHAEOLOGY MANAGEMENT AND MITIGATION PLAN								
Communication and Engagement	Pro-active management of Visual information to avoid any Stakeholder and potential social risks.	**LHU remains committed to:** • Ensure that all Archaeological Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Archaeological management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Archaeological to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Archaeological Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Archaeological Management issues. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied	X	X	X	X	X	X
Managing Archaeological and cultural sites	The objective of the management measures is to prevent the unacceptable loss of archaeological sites and related historical information.	If archaeological sites are located near to construction sites, cordon off the relevant site and instruct contractors on the procedures to be followed when working in close proximity to archaeological sites.		X				
		When planning new structures, consult the archaeology sensitivity map and avoid, where possible, known archaeological sites. If areas are to be destroyed, report this to the National Monument Council and obtain clearance.	X	X	X		X	X
		Where necessary, disturbance of archaeological sites is reported to National Monument Council and the information in the specialist report is used to apply for the necessary permits that are required in terms of the National Heritage Act 2004.		X	X		X	X
		Access to undisturbed archaeological sites within the lease and on nearby land is restricted (cordon off, no driving, etc.)	X	X	X	X	X	X
		Location of archaeological sites within an area to be disturbed is identified.	X	X	X	X	X	X
		Area to be disturbed is assessed in terms of the sensitivity of archaeological sites	X	X	X		X	X
Managing Chance heritage finds.	To ensure that the correct actions are taken to preserve or document chance archaeological finds.	If relics are found on site, report these findings to the Environmental Manager who will decide on the appropriate action.	X	X	X	X	X	X
		Implement the chance find procedure. The key component of which is to ensure that the site remains undisturbed until a specialist has assessed the site, assessed the potential damage, advised on the necessary management steps and advised on the requirements for stakeholder consultation and permitting.	X	X	X	X	X	X

C.2.5.12. Resources Management and Management Plan

RESOURCE USAGE MANAGEMENT AND MITIGATION PLAN								
Context	This MMP provides management actions regarding scares sources like water and provides means of reducing consumption of resources.							
Objective	Reduce the consumption of both renewable and non-renewable resources.							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To ensure full compliance with lighting and Resource usage amenity approval conditions.	**<u>LHU remains committed to:</u>** • Identify, implement, maintain and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Resource usage at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Resource usage. • Record, report and address any non–compliances with regulatory and site requirements associated with Resource usage. • Design, construct and operate its facilities in accordance with appropriate practices and ensure that construction meets relevant Standards and regulatory requirements and addresses all the identified significant risks **<u>Relevant legal and other requirements</u>** • Constitution of the Republic of Namibia, 1990 • The Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • The Minerals (Prospecting and Mining) Act, No 33 of 1992. • Namib Naukluft Park Permit Conditions. • Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • Atomic Energy and Radiation Protection Act, 5 of 2005 • The Minerals (Prospecting & Mining) Act, No 33 of 1992 • The Namibian Water Corporation Act, 12 of 1997 • The Public Health Act, 36 of 1919 • The Water Act (Act 56 of 1956) • Water Resources Management Act 2004 • Labour Act (Act No 6) of 1992. • Minerals Policy of Namibia, 2002 • Petroleum Products and Energy Act, 13 of 1990 • Petroleum Products Regulations 2000. • The Soil Conservation Act 76 of 1969 of South Africa is applicable in Namibia since 1971. • Regulations made under the provisions of the Mines, Works and minerals ordinance of 1968 (ordinance 20 of 1968). • Regulations relating to the Health and Safety of Employees at Work promulgated in terms of Section 101 of the Labour Act 6 of 1992 (GN156, GG1617 of 1 August 1997). • Abstraction and Borehole permit (Permit No. 10456). • Wastewater and effluent disposal exemption permit number 669.	X	X	X	X	X	X

RESOURCE USAGE MANAGEMENT AND MITIGATION PLAN								
		• Monitoring Boreholes Permits; 10996, 10831, 10770. • Nature Conservation Ordinance No. 4 of 1975 and the Forest Act 12 of 2001, as amended in 2005. • Forestry Act No. 72 of 1968. • The Convention on Biological Diversity. • Strategic Environmental Management Plan (Uranium) • Equator Principles (Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management,) • The Atmospheric Pollution Prevention Ordinance, 11 of 1976 • United Nations Framework Convention on climate change, 1992 • The Montreal Protocol on substances that deplete the Ozone Layer, 1987 • Vienna Convention for the protection of the ozone layer, 1985						
Risk Management	Prevent or reduce the consumption of non-renewable and scare resources.	**LHU remains committed to:** • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Resource usage impacts in accordance in accordance to the ISO 31000 Risk Management Process • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the risk associated with Resource usage management. • Have a risk management register in which the identified Resource usage Risks are documented. • Provide awareness and training on the Resource usage risk to identified Stakeholders. • Develop, implement, document and review the required Resource usage Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Resource usage risks / impacts and potential deviations.	X	X	X	X	X	X
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Resource usage Management.	**LHU remains committed to:** • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Resource usage Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Resource usage Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of Risks associated with Resource usage Management.	LHU remains committed to: • Provide the appropriate Resource usage Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also Resource usage management. • Provide comprehensive, Risk Base Resource usage Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task.	X	X	X	X	X	X
Emergency Preparedness and Response	To ensure effective emergency response and recovery from adverse effects on ecosystem services stemming from over-use of scarce resources and non-renewable resources.	**LHU remains committed to:** • Identify throughout the different stages of the mine operation what activities, infrastructure or products may result in adverse effects on landscape character and Resource usage receptors. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X

RESOURCE USAGE MANAGEMENT AND MITIGATION PLAN								
Monitoring and Measurement	To evaluate LHU's impact resources usage through monitoring of consumption or scarce and non-renewable resources.	**LHU remains committed to:** • Undertake the required Resource usage Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Resource usage Monitoring and update as deemed necessary. • Conduct Resource usage monitoring and measurements in accordance to certificate, permit or licence conditions. • The results of LHU's Resource usage Monitoring and Management Program will continue to be reported in the reports submitted to the identified stakeholders. • Monitor and measure the consumption of energy (electricity, petrol, diesel, HFO) and the generation of CO_2 emissions. • Monitor and measure the consumption of water (Freshwater supply by NamWater and Swakop River Groundwater). • Monitor and measure the consumption of recycled water. • Monitor and measure the consumption of reagents and chemicals when in Operation. • Monitor and measure the generation of Mineral and Non-Mineral Waste	X	X	X	X	X	X

Reporting	Managing effective and on time Resource usage Reporting in accordance to Permitting, Licencing and Certification Requirements.	**LHU remains committed to:**
		• Ensure that all Resource usage Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ The location, volume and surface areas of waste rock dumps and stockpiles are included in biannual.
		  ○ Consumption of Energy, Water (Fresh Water and Storm water run-off), Reagents and Chemicals (when in Operation).
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Resource usage Monitoring will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining to Resource usage Management.
		• Identify, record and report all issue and concerns related to Resource usage management into a register.
			X	X	X	X	X	X

Communication and Engagement	Pro-active management of Resource usage information to avoid any Stakeholder and potential social risks.	**LHU remains committed to:** • Ensure that all Resource usage Management Communication and Engagement is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions. • Review and provide feedback on issue and concerns related to Resource usage management to the appropriate audience. • Communicate any changes that LHU's activities may have on the surrounding Resource usage to the identified Interested and Affected Parties. • Ensure that information pertaining to LHU Resource usage Management is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process is applied. • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Resource usage Management issues. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied	X	X	X	X	X	X
Managing the Consumption of Energy (Electricity, Petrol, HFO and Diesel)	The objective of the management measures is to monitor the energy (Electricity, Petrol, HFO and Diesel)	Maintain the energy consumption monitoring system.	X	X	X	X	X	X
		Review energy consumption in relation to the energy management plan.	X	X	X	X	X	X
		Continue to implement an awareness programme pertaining to energy usage.		X	X	X		

	consumption and to find ways to minimise consumption.	Maintain the maintenance schedule for all equipment on site that uses Electricity, Petrol, Diesel or HFO.	X	X	X	X	X	X
		Maintain and implement the preventive maintenance plan for all equipment and mine vehicles using diesel, petrol and gas on site to avoid wastage and leakages.	X	X	X	X	X	X
		Report hydrocarbon spillages as per the incident management procedure.	X	X	X	X	X	X
Managing the Consumption of Water	The objective of the management measures is to monitor the water consumption and to find ways to optimise water usage.	Install and calibrate water flow meters on pipes at selected locations (including tailings lines and dewatering boreholes).	X	X	X	X		
		Monitor monthly abstraction volumes to ensure that the permitted annual volumes are not exceeded.		X	X			
		Maintenance of water infrastructure and associated equipment.	X	X	X	X	X	X
		Further develop, maintain and implement a comprehensive maintenance programme for tanks, tankers, pumps, pipes ponds and reservoirs.		X	X	X		
		Monitoring and reporting of water leaks and spills	X	X	X	X	X	X
		Daily checking for water spills.	X	X	X	X	X	X
		Report spillages as per the incident management procedure.	X	X	X	X	X	X
		Maintain and implement water awareness programme for all employees (LHU and Contractors).	X	X	X	X	X	X
		If Groundwater is encountered in the pit, ensure that it is dewatered and managed (e.g. used in the process plant).		X	X	X	X	
		Ensure that storm water falling inside the processing area is captured and directed via drains and pipes to the process pond and re-used.		X	X			
		Revisit the existing operational site wide water balance taking rainfall and the proposed additional processes into account to ensure that the design of the relevant clean and dirty water systems are sufficient to cater for the water volumes associated with the infrequent flood events and that unacceptable discharges of polluted water are prevented.			X			
		Optimise the recycling of process water in the process plant to reduce the demand for fresh water.		X	X			
		Recycle tailings decant water back to the Process pond in closed pipes for reuse in the process plant.		X	X	X	X	
Managing the use of manufactured materials	The objective of the management measures is to monitor the use of manufactured materials and to ensure efficient usage.	Conduct routine inspections of the supply companies transporting hazardous materials to and from site.		X	X	X	X	X
		Ensure companies compliance to legal and LHM requirements and that the contractor has all the necessary hazardous protection equipment for people and environment in the advent of a spill.		X	X	X	X	X
		Monitor consumption of reagents and chemicals monthly.		X	X			
		Identify consumables that might qualify to be replaced by more environmentally friendly products and conduct market research on such products.		X	X			

RESOURCE USAGE MANAGEMENT AND MITIGATION PLAN								
		Monitor the consumption of consumables (e.g. PPE, paper)		X	X			
		Calculate the volumes of consumables used and determine ways of reducing consumption.		X	X			
		Investigate use of alternative (environmentally friendlier) consumables instead of the current products (where applicable).		X	X			
		Implement a programme of recovering, reassigning or re-use used engineering equipment.	X	X	X	X	X	X
		Monitor and update the process flow balance regularly to ensure optimum use of reagents.		X	X			

C.2.5.13. Rehabilitation and Restoration Management and Mitigation Plan

REHABILITATION AND RESTORATION MANAGEMENT AND MITIGATION PLAN								
Context	Some of these impacts can disturb the structure and ecological functioning of a landscape. At LHU rehabilitation is the term that broadly refers to all measures to repair damaged areas as a result of mining activities and includes the mechanical processes to repair the physical structure of the landscape as well as the restoration processes to initiate and accelerate the recovery of ecosystems in order to reinstate the eventual ecological functioning of the landscape. LHU has made a commitment to rehabilitate disturbed areas within its mine lease, progressively as well as finally when operational activities are ceased. This commitment is aligned to compliance with all applicable environmental and other regulatory legislation. Accordingly, LHU is dedicated to implement appropriate measures to avoid, manage, mitigate and remediate negative impacts and to maximize positive impacts within its mine lease in order to leave no liability to the company, government and community behind.							
Objective	Rehabilitation and restoration will be sustainable and, where operationally practicable, is undertaken progressively.							
Target	Rehabilitation works will, at end of Life of Mine result in a stable landscape and stable realigned drainage channels having minimum impact on the surrounding environment							
Management Measures	**Objective of Management Measure**	**Management Commitment**	**Design Phase**	**Construction Phase**	**Operational Phase**	**Care and Maintenance Phase**	**Decommissioning Phase**	**Closure Phase**
Legal and other requirements	To establish, implement and maintain procedures to identify and record compliance / conformance against all legal and other requirements as well as identifying how they are applicable to Rehabilitation risks.	**<u>LHU remains committed to</u>**: • Identify and document all relevant Acts, Regulations, Licences and Regulatory Requirements and Conditions associated with Rehabilitation and Restoration activities at the site. • Ensure that all approvals and licences are obtained prior to the activity being commenced. • Comply with all regulatory requirements and conditions associated with Rehabilitation and Restoration. • Record, report and address any non–compliances with regulatory and site requirements associated with Biodiversity. .**<u>Relevant legal and other requirements</u>** • The Constitution of the Republic of Namibia states that any activity must comply with Section 95(l) • Environmental Management Act, 7 of 2007 and its regulations, promulgated in 2011. • The Minerals Policy of Namibia, 2002 encourages the alternative use of land through rehabilitation, and the use of remaining infrastructure for on-going economic benefits after mine closure. Section 5.3 indicates that the authorities will ensure compliance during rehabilitation with national policies and guidelines. • The Minerals (Prospecting and Mining) Act, No 33 of 1992. • The Uranium Rush Strategic Environmental Assessment (U-SEA)	X	X	X	X	X	X

REHABILITATION AND RESTORATION MANAGEMENT AND MITIGATION PLAN								
Risk Management	To pro-actively identify and manage Biodiversity Risks associated with LHM operation in order to avoid or prevent Biodiversity degradation.	**LHU remains committed to**: • Identify, record and review all activities, services, facilities and products associated with the different phases of its operation in order to identify the associated environmental aspect and potential impacts. • Evaluate, the identified Biodiversity impacts in accordance in accordance to the ISO 31000 Risk Management Process. • Identify, document and implement risk mitigation and controlled measures in accordance to Paladin Risk Management Procedure. • Regularly review the Rehabilitation and Restoration risk. • Have a risk management register in which the identified Rehabilitation and Restoration Risks are documented. • Will communicate Rehabilitation and Restoration Risks to the identified • Provide awareness and training on the Rehabilitation and Restoration Risk to identified Stakeholders. • Develop, implement, document and review the required Biodiversity Management Standard Operating Procedures, Standard Work Instructions, Forms and Registers to address significant Biodiversity risks / impacts and potential deviations.	X	X	X	X	X	X
Roles and Responsibilities	To ensure resources are identified and accountability appropriately allocated for the maintenance and continual improvement of Rehabilitation and Restoration Management.	**LHU remains committed to**: • Ensure adequate financial, human, technological and organisational resources are provided for to implement and maintain this Biodiversity Management Plan throughout the different phases of the mine operation. • Assign the required accountabilities and responsibilities to ensure the development, implementation, maintenance and review of the Biodiversity Management Plan throughout the different stages of the mine operation.	X	X	X	X	X	X
Competencies, Training and Awareness	To ensure employees (LHU and Contractors) are competent in the management of associated with Risk Base Rehabilitation and Restoration Management.	**LHU remains committed to:** • Provide the appropriate Risk Base Rehabilitation and Restoration Induction to all employees (LHU and Contractors) and site visitors. • Provide general environmental awareness by means of Toolbox Talks, newsletters, information displays and formal training. Content of this program covers also biodiversity management. • Provide comprehensive, Risk Base Rehabilitation and Restoration Management training to the relevant employees, which is directly link to the impact that activities and products use to perform a task.	X	X	X	X	X	X
Emergency Preparedness and Response	To Ensure effective emergency response and recovery plans are available to minimise Risk Base Rehabilitation and Restoration degradation.	**LHU remains committed to:** • Identify environmental impact assessment throughout the different stages of the mine operation what activities, infrastructure or products result in possible Rehabilitation and Restoration emergencies scenarios. • Develop, document and review effective plans, response processes and resources are available to minimise injury, property damage or harm to the environment. • Ensure the appropriate level of resources (plans, procedures, facilities, equipment and trained personnel) are available for an effective response to control and recover from disaster and emergency situations.	X	X	X	X	X	X
Monitoring and Measurement	To evaluate LHU's impact on the ecosystem services and surrounding environment and identify and implement appropriate mitigation measures to prevent and avoid long term impacts.	**LHU remains committed to:** • Undertake the required Rehabilitation and Restoration Monitoring Program to demonstrate compliance with the statutory reporting commitments and all other relevant requirements. • Regularly assess the effectiveness of the LHU's Rehabilitation and Restoration Monitoring and update as deemed necessary • Monitoring of topsoil – as stockpiled resource as well as applied growth medium is done to report on passive re-vegetation. • Monitoring of re-vegetation progress – to measure the establishment of key plant species and in particular pioneers, annuals and perennials. Significant and indicator plant species are *Lithops gracilidelineata*, *L. ruschiorum*, *Aloe*						

		namibensis, Euphorbia damarana Larryleachia marlothii, Hoodia currorii, Commiphora saxicola, C. virgata and *C. glaucescens.* • Monitoring species diversity, the presence of alien invasive species and weeds, and signs of herbivores are important aspects to measure augmenting and strengthening of natural ecological processes over time. • Confirmatory monitoring on sites representative of areas under rehabilitation is necessary to measure progress against areas of similar biodiversity attributes. • Seasonal variations are taken into account and reported for reference purposes, also during the post-decommissioning phase, until the rehabilitation targets have been reached. • The movement and presence of unusual large mammals in the lower Gawib, (e.g. kudu, warthog, and baboon) is indicative of successful corridor functioning, for example. Similar, the re-establishment of the wasps of the family *Pompilidae* is a relevant invertebrate target because these wasps will only exist where the necessary components of the ecosystem have been established. • The presence of animals of conservation interest is also important. These include the sand lizards *Pedioplanis husabensis, P. inornata, P. namaquensis*; all snakes; and Hartmann's mountain zebra *Equus zebra hartmannae*. • Track and record the growth, further development and fate of transplanted vegetation. This is done in order to inform future decisions on plant rescue and relocation, as reference information and to inform the public. • The results of LHU's Rehabilitation monitoring program will continue to be reported in the reports submitted to the identified Ministries within Government on LHU's environmental performance.						

Reporting	Managing effective and on time Rehabilitation and Restoration Reporting in accordance to Permitting, Licencing and Certification Requirements.	**<u>LHU remains committed to:</u>**
		• Ensure that all Rehabilitation and Restoration Management Reporting is undertaken in accordance to the agreed permitting, licencing and certification requirements as well as other agreements and conditions.
		  ○ Reportable Fauna deaths.
		  ○ Reportable events that may have catastrophic impacts on the Rehabilitation and Restoration measures.
		  ○ Bi-annual Environmental Performance Feedback Report.
		  ○ Annual reporting (GRI, SEMP, etc.)
		• All internal Rehabilitation and Restoration Management Reporting will be done in accordance to the requirements as set out in Paladin Energy and Langer Heinrich Reporting requirements pertaining
			X	**X**	**X**	**X**	**X**	**X**

Communication and engagement	To maintain LHU's reputation as a Transparent and responsible company.	**<u>LHU remains committed to:</u>** • Facilitate the involvement and participation of all employees, contractors, customers and relevant stakeholders in the management of Rehabilitation Management issues. • Ensure that information about rehabilitation progress is effectively shared with the correct audience, on time, and using the correct communication means and processes, the formal environmental communication process (Environmental Communications Procedure) is applied. • Communication includes continuous emphasis on the environmental policy, environmental Standards and objectives, and the Environmental Management Plan of LHU; reporting of environmental performance and relevant incidents; managing of environmental complaints; environmental training and incorporation of changes (legislative, process and organizational).	**X**	**X**	**X**	**X**	**X**	**X**
Repair the landscape structure	To successfully rehabilitate all disturbed areas relating to the mining activities	Determine which open voids and mined-out pits are available for backfilling with waste rock or infilling with tailings according to the Life of Mine Plan and schedule activities accordingly.			**X**		**X**	**X**
		Open pit backfilling and infilling operations are covered and profiled to prevent exposure, erosion and subsidence.			**X**		**X**	**X**
		Determine which man-made landforms that will remain aboveground are available for topographical sculpturing and schedule activities accordingly.			**X**		**X**	**X**
		Profile slopes so that they are protected against flood damage and have an angle to mitigate erosion.			**X**		**X**	**X**

		Identify unwanted obsolete infrastructure and progressively demolish prior to decommissioning.		x	x			
		Identify unwanted obsolete infrastructure for final demolition during decommissioning		x	x	x	x	
		Identify rehabilitation needs where infrastructure is demolished		x	x			
		Backfill, cover and profile areas where infrastructure was demolished			x		x	x
		Determine which disturbed areas (including tracks and roads) are available for progressive rehabilitation and schedule accordingly.			x	x	x	x
		Stockpiled soil is relocated to profiled disturbed sites as they become available for rehabilitation		x	x			
		Prepare topsoil medium for restoration purposes (add fertilizers / nutrients / organic matter).			x		x	
		Ensure effective horizontal and vertical drainage, permeability and water retention.		x	x		x	x
		Establish additional erosion control measures to ensure that the topsoil is not washed away and rehabilitated areas are not re-disturbed.		x	x		x	x
		Re-establish soil layers on disturbed areas as close as possible similar to pre-mining conditions.		x	x		x	xx
		As far as possible reinstate original drainage lines, without additional erosion.		x	x		x	x
		Inspect above surface landforms to detect instability and signs of erosion indicated by major rills, gullying, piping and ponding.		x	x	x	x	x
		As far as possible, re-create the alluvial terrace In mined-out pits in the Gawib River valley.		x	x		x	x
		Prevent the movement of blocked water does through the tailings deposition zone and seep pollution into the more permeable shallow alluvial aquifer above.			x	x		
		Mined-out areas immediately beneath the main channel of the Gawib River are covered with impermeable layers, or more preferably, not in-filled with tailings.		x	x			
Reinstate the ecological functioning of the landscape	To successfully rehabilitate all disturbed areas relating to the mining activities	Identify plants threatened by disturbance and arrange for necessary approvals for relocation (harvesting permit, land disturbance clearance, etc.).		x	x		x	x
		Relocate plants threatened by disturbance to similar areas under rehabilitation or areas earmarked for no disturbance		x	x		x	
		Monitor relocated plants to measure progress and to identify adequate support (watering, fertilizing, etc.)		x	x	x	x	x
		Passive re-vegetation is promoted as the trigger mechanism to re-establish local biodiversity.		x	x		x	x
		Where appropriate, relocate local biodiversity by means of out-planting, planting, seeding and animal release in areas under rehabilitation.			x		x	x
		Apply adequate nursery techniques to propagate selected key plant species through seeding, cutlets, transplanting, etc.			x		x	x

		Store relocated plants adequately at the nursery for out-planting on suitable restored areas later		x	x			
		Conduct seed harvesting under suitable conditions in order to secure sufficient reproduction material.		x	x	x	x	x
		Cooperative relations with research institutions and collaborative agencies are established to strengthen the knowledge base on restoration of arid environments.		x	x		x	x
		Map and record all disturbed and rehabilitated areas by year of disturbance and rehabilitation, and record in land use database system		x	x		x	
		Facilitate research and initiate monitoring trials on WRD E and F and all permanent TSF's to identify and fill information gaps applicable to restoration of arid environments.		x	x			
		Rehabilitated areas are inspected to detect instability and erosion indicated by major rills, gullying, piping and ponding		x	x	x	x	x
		The state of rehabilitated areas is inspected to take seasonal variations into account and reported for reference purposes, also during post-decommissioning, until the rehabilitation targets have been met.		x	x	x	x	x

C.3. ROLES & RESPONSIBILITIES

C.3.1. Roles & Responsibilities for Environmental Management and for implementing the various MMPs

Managing Director/General Manager

The LHU Managing Director/General Manager has overall responsibility for environmental management on the mine and for ensuring this EMP is implemented. To assist the General Manager in this requirement, LHU has a SHER Department which is dedicated to managing and monitoring the Environmental issues associated with LHM's activities.

Head of Departments

LHU SHER Department is the delegated custodian of the EMP and each Head of Department will update the relevant EMMP to include all of the commitments made in this EIA and EMP and to ensure they are being implemented

SHER

This Department is responsible for assisting Paladin and the LHU General Manager and various LHU Managers in all environmental and community issues and specifically to ensure that the commitments as set out in this EMP are implemented during the design, operations, care and maintenance decommissioning and closure phases.

In addition to the above, the Environmental Department is responsible for ensuring that all contractors are fully aware of and comply with the contents of this EMP. The department will also assist the specific contract managers/persons managing these long term contractors with their adherence to these commitments made in the EMP.

The following specific tasks (amongst others) fall within the Environmental Department's responsibility:

- Integrating this EMP into the EMS and maintaining its relevancy and update (and continuously improving) this system where appropriate.
- Environmental audits and inspections.
- Environmental Training and awareness.
- Environmental Monitoring.
- Reporting on the Environmental issues.
- Liaising with LHM Management and various external stakeholders on Environmental Management (where required).
- Integrating this EMP into the LHM Mine Closure Plan.

Contractors

The Long term Contractor Managers, under the supervision of the LHM Technical Services Manager and Engineering Manager, are responsible for implementing the various commitments in this EMP relating to all mining activities in the operations phase.

External specialists

LHU will appoint external environmental specialists, as and when required, to assist with the implementation of certain commitments made in the various MMPs.

Employees

All employees (LHU and Contractors) are responsible to execute the relevant Management and Mitigation Plans in accordance to the respective roles descriptions and annual work plans.

C.3.2. Environmental Management and Mitigation Plans

LHM has developed various Environmental Management and Mitigation Plans. These Plans guide the implementation of the various Environmental requirements for the operations phase of the project. The responsibilities and target dates for implementation of all environmental requirements are detailed in these Plans.

The LHM Environmental Department and relevant Managers will update these Environmental Plans with all the actions/commitments contained in this EMP and revisit the responsibilities and target dates.

C.3.3. Mine Closure Strategy and Plan

LHM has developed a Mine Closure Strategy and draft Mine Closure Plan in line with the Namibian Mine Closure Framework (Chamber of Mine of Namibia, 2008). The draft Mine Closure Plan will be updated to include the relevant decommission and closure commitments contained in this EMP.

C.3.4. Mitigation Cost

The relevant management and mitigation requirements stipulated in Section B.1 of this EMP will be considered when the operation budget (including the environmental budget) is updated. Also, the relevant project budgets and various contracts with contractors will include provision for the commitments provided in this EMP.

C.4. CONCLUSION

This Environmental Management Plan (EMP) will be used to further develop/update the Environmental Management and Mitigation Plans (EMMP's. The EMMPs will be updated to ensure the objectives provided in this EMP are achieved and commitments are implemented.

LHU remains committed to:

On-going improvement on Environmental Performance.

- Continue to engage and consult with its identified Stakeholders.
- Continue to openly and transparently report environmental information.
- The ongoing management and reduction of identified Safety, Health, Environmental, Radiation and Security risks to a risk level as low as is reasonably practicable.

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3. DOCUMENT CONTROL AND RECORD MANAGEMENT

This plan is a controlled document in accordance with the LHU Document Control Procedure

Document Control	***NAME***	***DESIGNATION***	***SIGNATURE***	**DATE**
REVIEWED	Frances Anderson	SHER Manager		
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