



CATHRAL INVESTMENTS NINETY ONE (Pty) Ltd

ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED SINCLAIR PROJECT

**Prepared for: Cathral Investments Ninety One (Pty) Ltd and Tulela Processing Solutions
(Pty) Ltd**

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ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED SINCLAIR PROJECT

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ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report and the EIA Scoping and Assessment report.

Acronyms / Abbreviations	Definition
BID	Background information document
CO	Carbon monoxide
CV	Curriculum vitae
dB	Descriptor that is used to indicate 10 times a logarithmic ratio of quantities that have the same units, in this case sound pressure.
dBA	Descriptor that is used to indicate 10 times a logarithmic ratio of quantities that have the same units, in this case sound pressure that has been A-weighted to simulate human hearing.
DEA	Department Environmental Affairs
EAP	Environmental Assessment Practitioner
EAPAN	Environmental Assessment Professionals' Association of Namibia
EC	European Commission
EHS	Environmental, Health, and Safety (IFC)
EIA	Environmental Impacts Assessment
EW	Electro Winning
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
ERP	Emergency Response Plan
H2SO4	Sulfuric acid
IAPs	Interested and/or affected parties
IFC	International Finance Corporation
ILS Pond	Inter-stage Leach Pond
ISO	International Standards Organisation
IT	Interim target
kg	Mass in kilogram
kW	Power in kilowatt
LAeq,T	The A-weighted equivalent sound pressure level, where T indicates the time over which the noise is averaged (calculated or measured) (in dBA)
LAIeq,T	The impulse corrected A-weighted equivalent sound pressure level, where T indicates the time over which the noise is averaged (calculated or measured) (in dBA)

LReq,d	The LAeq rated for impulsive sound and tonality in accordance with SANS 10103 for the day-time period, i.e. from 06:00 to 22:00.
LReq,n	The LAeq rated for impulsive sound and tonality in accordance with SANS 10103 for the night-time period, i.e. from 22:00 to 06:00.
LP	Sound pressure level (in dB)
LPA	A-weighted sound pressure level (in dBA)
LoM	Life of Mine
mamsl	Meters above mean sea level
m	Distance in meters
m ²	Area in square meters
MAP	Mean annual precipitation
masl	Meters above sea level
ML	Mining License
MET	Ministry of Environment and Tourism
MSDS	Material Safety Data Sheet
MW	Power in megawatt
Pa	Pressure in Pascal
PLS	Pregnant Liquor Solution
PM30	Particulate matter with an aerodynamic diameter of less than 30 µm
PM10	Particulate matter with an aerodynamic diameter of less than 10 µm
PM2.5	Particulate matter with an aerodynamic diameter of less than 2.5 µm
Pty	Proprietary
s	Time in seconds
SAAQIS	South African Air Quality Information System
SANAAQS	South African National Ambient Air Quality Standards
SANS	South African National Standards
SAWS	South African Weather Service
SEMP	Strategic Environmental Management Plan
SO2	Sulphur dioxide
SSA	Standards South Africa
SSC	Soundscape Consulting
SRTM	Shuttle Radar Topography Mission
SX	Solvent extraction
t	Mass in tonnes
Tulela	Tulela Processing Solutions
WHO	World Health Organisation

ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED SINCLAIR PROJECT

1 INTRODUCTION

Cathral Investments Ninety One (Pty) Ltd (i.e. Cathral Investments) holds Exclusive Prospecting License (EPL) 6545, which is located in the Lüderitz district, Karas Region approximately 50 km northwest of Helmeringhausen and 112 km south-west of Maltahohe (see Figure 1). Tulela Processing Solutions (Pty) Ltd (i.e. Tulela), a wholly-owned Namibian Metallurgical and Mining company, holds majority shares in Cathral Investments. Tulela intends to recover economical minerals from the Sinclair ore body.

This Environmental Management Plan (EMP) documents a series of individual management plans (MPs) which are designed to meet legal requirements, avoid, minimise or manage the impacts associated with the implementation of the proposed small scale mining and processing activities and ongoing exploration at the Sinclair mine on Exclusive Prospecting License (EPL) 6545, Karas Region (i.e. the “Sinclair Project”).

An EIA process was conducted for the proposed Sinclair Project and a subsequent EIA Scoping & Assessment Report has been produced by Namisun Environmental Projects and Development (Namisun). This process and report identified and assessed the potential environmental (and social) impacts associated with the project. Namisun Environmental Projects and Development (Namisun) is an independent environmental consultancy firm appointed by Tulela to undertake the EIA.

The management and mitigation measures recommended by the individual specialists in the above mentioned EIA process have, amongst others, been compiled into this EMP.

1.1 KEEPING EMPs CURRENT

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

Should a listed activity(s) as defined in the Environmental Impact Assessment Regulations: Environmental Management Act (EMA), 2007 (Government Gazette No. 4878) be triggered (as a result of future modifications/changes at the mine), this EMP will be required to be updated through another EIA process as stipulate in the EMA and its Regulations.

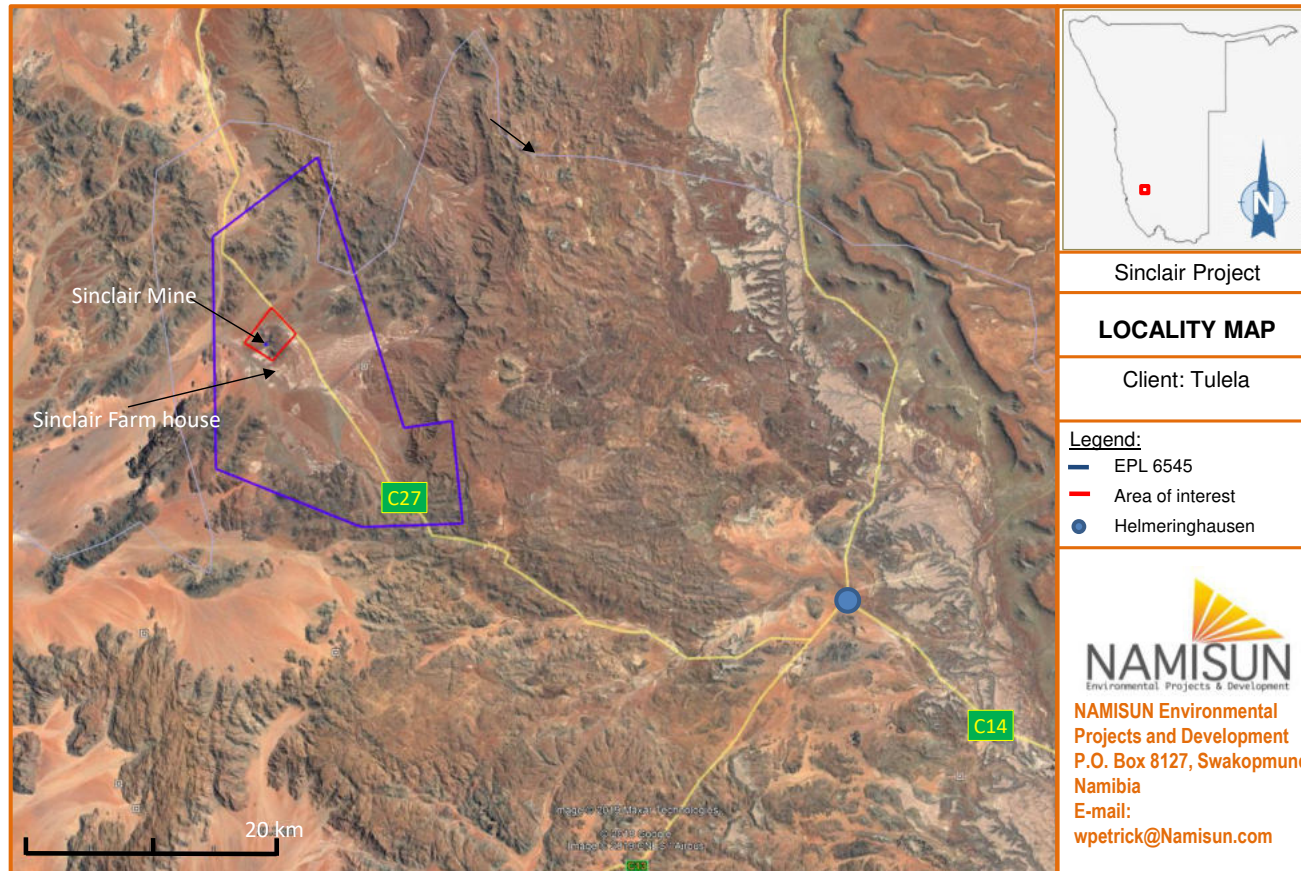


Figure 1: Regional Location of the Sinclair Project (REF: GOOGLE EARTH)

1.2 DETAILS OF THE PERSONS WHO PREPARED THIS EMP

Namisun, the independent environmental consultancy firm who compiled the Sinclair Project Scoping & Assessment Report has also compiled this EMP, with input from various specialists (presented in the EIA Scoping and Assessment Report). Werner Petrick, the EIA project manager has more than twenty years of relevant experience in conducting/managing EIAs, compiling EMPs and implementing EMPs and Environmental Management Systems. Werner is certified as lead environmental practitioner and reviewer under the Environmental Assessment Professionals Association of Namibia (EAPAN).

1.3 MANAGEMENT PLANS LINKED TO IDENTIFIED ENVIRONMENTAL AND SOCIAL ASPECTS

Understanding the biophysical and human environment in which a mine operates is the first step to understanding environmental impacts. The next and possibly more important step is to identify the environmental aspects that give rise to the impacts.

Successful management will be gauged by how well Cathral Investments avoids, minimises or mitigates all the impacts associated with each environmental aspect at their Sinclair mine project.

As part of the EIA process for the Sinclair mine project, environmental aspects and potential environmental impacts associated with the activities and facilities were identified. The full suite of the proposed Sinclair Project activities and facilities, associated with the various phases are described in the EIA Scoping and Assessment Report and summarised in Section 4 of this EMP.

Table 1 provide a summary of identified issues and corresponding management plans (section 6 of this EMP).

TABLE 1: SUMMARY OF ISSUES IDENTIFIED IN EIA PROCESS AND CORRESPONDING MANAGEMENT PLANS

Environmental component (reference to Section 7 of the Scoping Report)	Issue (reference to Section 7 of the Scoping Report)	Relevant MP (reference to Section 6 of the EMP)
Hazardous excavations, infrastructure and activities	Increased risk of injury/fatality to third parties or animals: Falling/trapped in the open pit.	MP7.1 – Stakeholder consultation MP7.2 – Safety & Security
	Loss of soil resources from soil pollution	MP7.14 – Waste management
Soils and land capability	Loss of soils resource through physical disturbance	MP13 – Soil management MP7.7 – Biodiversity
	Physical impacts on biodiversity	MP7.7 – Biodiversity
Biodiversity – Natural vegetation and animal life	General disturbance of biodiversity	MP7.7 – Biodiversity MP7.14 – Waste management
	Altering drainage patterns	MP7.3 – Surface Water
Surface water	Contamination of surface water	MP7.3 – Surface Water MP7.14 – Waste Management
	Groundwater abstraction – reduction in groundwater levels	MP7.4 – Groundwater MP7.11 – Socio-Economic
Groundwater	Contamination of surface water	MP7.4 – Groundwater MP7.14 – Waste management
	Air pollution	MP7.5 – Air quality
Air quality	Noise pollution	MP7.6 – Noise
Noise	Damage to significant heritage sites	MP7.9 – Heritage
Heritage	Visual impact	MP7.8 – Visual
Visual	Economic impacts	MP7.1 – Stakeholder consultation MP7.2 – Safety & Security MP7.11 – Socio-Economic
	Job creation and skills development	
	Community health, safety and security.	
Traffic	Traffic Impacts	MP7.10 - Traffic

2 SCOPE OF EMP

The components of the EMP are included in Table 2 below.

TABLE 2: CONTENT OF THE EMP

EIA Regulation requirement	EMP Reference
Introduction and details of the persons who prepared the EMP and the expertise of those persons to prepare an environmental management plan.	Section 1.2
Relevant legislation and permit requirements	Section 2
A description of the aspects of the activity that are covered by the EMP.	Sections 4
Overall environmental Objectives	Section 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 – <ul style="list-style-type: none"> i. Planning and design ii. Construction activities iii. Operation or undertaking of the activity iv. Rehabilitation of the environment Closure, where relevant	Section 6
An identification of the persons to be responsible for the implementation of the mitigation measures.	Sections 7
Proposed mechanisms for monitoring compliance with the EMP and reporting on it.	Section 8

3 ENVIRONMENTAL LEGISLATION

3.1 INTRODUCTION

Cathral Investments & Tulela Processing complies with all Namibian legislation, and where legislation is lacking will comply with international best practice procedures. Table 3 provides a summary list of the relevant legislation applicable to the Sinclair mine project.

TABLE 3: LIST OF LEGISLATION RELEVANT TO MINING IN NAMIBIA

YEAR	NAME
1990	The Constitution of the Republic of Namibia of 1990
1956	Water Act, 1956 (No. 54 of 1956), as amended
1992	The Minerals (Prospecting and Mining) Act 33 of 1992
1999	Road Traffic and Transport Act, 1999 (No. 22 of 1999)
2001	The Forestry Act 12 of 2001
2013	Water Resources Management Act 11 of 2013
2004	National Heritage Act 27 of 2004
2007	Labour Act, 2007 (No. 11 of 2007)
2007	Environmental Management, Act 7 of 2007
2012	Regulations promulgated in terms of the Environmental Management, Act 7 of 2007
1975	Nature Conservation Ordinance 14 of 1975
1976	Atmospheric Pollution Prevention Ordinance 11 of 1976
2003	Pollution Control and Waste Management Bill (3rd Draft September 2003)
1990	Petroleum Products and Energy Act, No. 13 of 1990
1974	Hazardous Substance Ordinance, No. 14 of 1974
2015	Public and Environmental Health Act No. 1 of 2015

3.2 PERMITS

Cathral Investments proposes to apply for a Mining Licence (ML) from the Ministry of Mines and Energy (MME) for mining; processing of the ore and associated activities. The proposed ML area would cover an area indicated by the red block (area of interest) in Figure 1, which is approximately 863 ha in size.

Prior to the development of the proposed mining, processing and further exploration activities at the Sinclair Mine, environmental clearance is required, for specific 'listed activities' specified in

the above mentioned regulations, from the MET: Department Environmental Affairs (DEA) on the basis of an approved EIA process.

Table 4 summarises the notification, registration, approval and permits required, relating to environmental aspects for the proposed Sinclair Project. Table 5 identifies the permits and certificates that may require application prior to the start of mining.

Table 4: Notification, registration, approval and permits

Issue	Act/Section	Type of requirement/Ministry
Mining licence	Section 91(f)	Approval of EIA and EMP/MME and MET
Written permission of the Mining Commissioner (MC) to erect any accessory works	Section 90 (2) (a)	Written permission from MC/MME
Permission to sell, discharge, etc. Minerals mined	Section 102 (1)	Permission from MC/MME
Permit to store and handle explosives on site	Explosives Act No. 26 of 1956	Permit
Stipulates the purification of waste water and discharge	Section 21 (1) (2) (3) (4) (5) & 22	Permit for industrial waste water and effluent disposal. Directorate of Water Affairs in MAWF
Picking and transport of protected plants	Nature Conservation Ordinance, No. 4 of 1975 Section 73	Plant removal permit/Approval of landowner/Directorate of Parks and Wildlife in MET or the NBRI
Picking, removal of protected plants	Section 73	Permit/DPW in MET
Sale, donation, export and removal of protected plants	Section 74	Plant export permit /MET
Registration, selling, operating, installing of infrastructure related to Group I and III hazardous substances	Hazardous Substance Ordinance, No. 14 of 1974 Section 5 (1)(a)(b)(c)	Licences required for the sale, use and storage of "hazardous substances", which are specified in certain groups. MET and MHSS
Disturbing or destroying of national heritage sites (archaeological/paleontological sites)	National Heritage Act, 2004 Section 48 – 52 and 55	Notify the National Heritage Council
Consumer installation certificate	Petroleum Product Regulations, 2000 Section 18 (5)	Certificate/license MME, Department of Energy
Actions to be taken after a spill has occurred (major petroleum spill means 200 l per spill)	Section 49(1)(4)	Notification/MME, Department of Energy

Issue	Act/Section	Type of requirement/Ministry
30-days notification prior to commencement of construction	Labour Act, 1992, Regulations for Labour Act 1992, Section 20	Notification/Ministry of Labour (MoL)
30-days notification prior to commencement of mining operation	Section 21	Notification/MoL
Transport/operating licence to transport goods on public roads	Roads Traffic and Transport Act, 1999 Section 60	Licence/Ministry of Works, Transport and Communication
Approval to work on Sundays, public holidays and continuous operation	Section 33	Approval/Ministry of Labour
Company must inform Chief Inspector (Ministry of Health and Social Services) before commencing building or construction work on the mine	Regulations concerning the Health and Safety of Employees at Work, 1997 (Government Notice 156 of 1997)	Ministry of Health and Social Services and Notification to MME
VAT registration	Value Added Tax Act, 2000	Certification
Tax registration	Income Tax Act, 1981	Certification
Social Security	Social Security Act, 1994 Section 20	Registration
Valid Affirmative Action compliance certificate	Affirmative Action Act, 1998, Section 42	Certification

TABLE 5: LIST OF PERMITS OR CERTIFICATES THAT MAY BE REQUIRED

Permit name	Regulator
Mining licence	MME
Environmental clearance for EIA and EMP	MET
Water discharge (NamWater)	Ministry of Agriculture, Water and Forestry (MAWF)
Licence for explosives magazine	MME/Police
Explosive burning permit	MME
Picking, removal of protected plants	DPW in MET

4 PROJECT OVERVIEW

Cathral Investments & Tulela Processing wishes to extract mineral ore from the area of interest in the EPL 6545 through, phase 1, processing the existing surface stockpiles and, phase 2, further exploration of ore deposits at the existing Sinclair mine. The depth of the open pit mine will be dependent on the results of the exploration, however, due to the nature of open pit mining, the depth of the mine will range from ± 5 to 30m.

The future mined ore (from the open pits and potentially from the box cut) will be hauled to the 'Plant feed stockpile' and similarly crushed and screened and then processed in the proposed (multiple) VAT/Heap leach facility and SX, EW & Stripping plant, as per phase 1. The estimated feed rate of ore to the crusher would be ± 50 t/hr and similarly to the VAT leach vessels.

The section below provide a summary if the key activities associated with the Sinclair Project. (The detailed project description of the proposed Sinclair project is included in the EIA Scoping and Assessment Report).

Refer to Figure 2 for the layout of the proposed infrastructure at the project site.

4.1 PHASE 1: PROCESS EXISTING SURFACE STOCKPILES

Existing material stockpiles (from historic mining activities) are located at various locations around cuts into the south-western face of the hill, at Sinclair Mine. Tulela proposes to move all these material stockpiles to a centralised location, i.e. the 'Plant feed stockpile'. Excavators and front end loaders will be used to relocate the small stockpiles.

By moving these ore stockpiles away from their current locations will allow Tulela to:

- Process the material to sell the copper product; and
- Clear the areas for further exploration.

No immediate blasting is required. However, in the longer term, depending on the exploration results, blasting might be required.

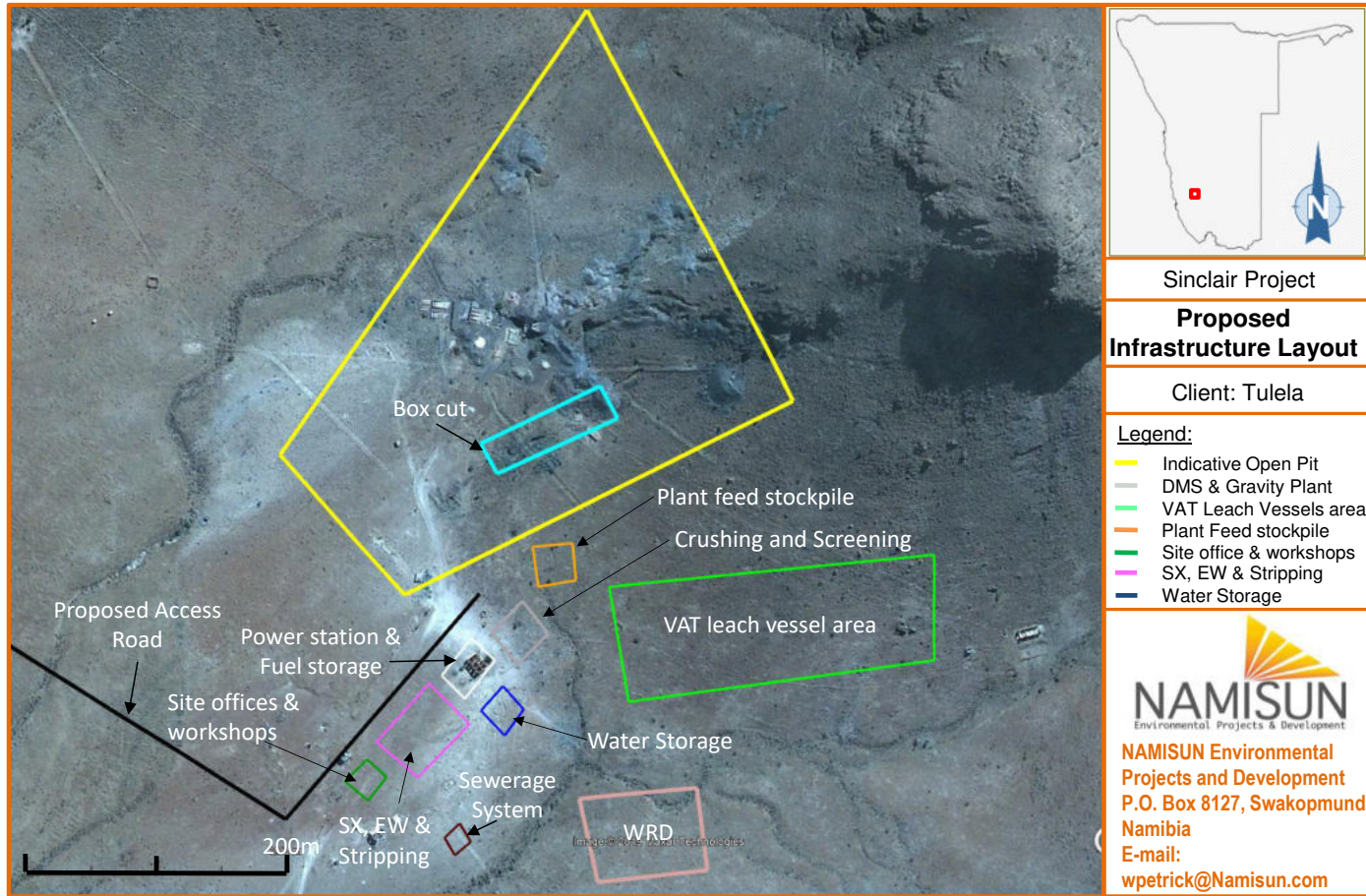


FIGURE 2: SINCLAIR PROJECT LAYOUT AND INFRASTRUCTURE

4.1.1 CRUSHING AND SCREENING

From the plant feed stockpile, the ore will first be crushed via a mobile crushing plant; and thereafter screened for heap leach treatment. This activity will present the opportunity to do thorough sampling to quantify the gold content and the results to feed into the gold extraction feasibility model.

From the crushing and screening facility, the ore will be placed in a Hybrid VAT/Heap Leach Facilities for further processing.

Hauling of ore grade material, as well as crushing and screening activities will be limited to daytime hours.

4.1.2 LEACHING

Multiple “Hybrid VAT/Heap leach vessels” (‘pans’) will be constructed. Each of the VAT/Heap leach vessels will be constructed on the ground surface and will have a footprint in the order of 2 500 m² and would be ± 6 m in height.

A total of 9 VAT/Heap leach vessels are likely to be implemented to process the existing material stockpiles as well as possible future mined ore.

The bottom and sides of the VAT/Heap leach vessels will be lined with an impermeable plastic lining and once the ore has been crushed and screened, it will be introduced into the leach area and covered (on top) with another plastic lining to reduce evaporation. Once the ore is ‘encapsulated’ inside the plastic lining it will be ready to be treated chemically.

HDPE Sheeting will be used for both the bottom and the top layer. The base will be levelled and rolled to smooth out any material that could damage the bottom plastic lining. A Bidim layer will be placed under the bottom plastic layer to add to the plastic lining protection. Before the ore can be introduced a top bidim layer will be laid to protect the plastic from the top side. The plastic liner will be 2mm thick made from flexible HDPE membrane.

Either an alkaline solution, or a sulfuric acid (H₂SO₄) solution will be added to the encapsulated material. Final test results being conducted by Tulela will dictate which solution will be used.

The solution will be added by means of a “drip irrigation system” that will be installed on top of the material (below the top plastic liner).

At closure, the entire VAT/Heap leach vessel (with the bottom, side and top plastic liner remaining) will be covered with waste rock material and then topsoil.

4.1.3 SOLVENT EXTRACTION AND STRIPPING (SX) AND ELECTRO WINNING (EW)

The leached copper-bearing solution (“PLS”) will be pumped, to the proposed solvent extraction and stripping (SX) section and electro winning (EW) processing plant where copper plates will be produced. The Raffinate solution will be recycled and pumped back onto the VAT / Heap leach material. An ‘Inter-stage Leach Pond’ (i.e. ILS pond, which will be a $\pm 100 \text{ m}^3$ lined facility) will be utilised to sustain the Cu tenor in solution between the various VAT/Heap leach vessels.

The process will make provision to possibly recover small quantities of gold and silver post the extraction of the copper. A cyanide solution will be added to the encapsulated material. The gold / silver-bearing solution will be extracted; filtered and precipitated.

The total estimated material to be processed during phase 1 is estimated at 75,000 tons.

The process has been optimised to recycle water as much as possible to lower fresh water requirements. The plastic lining on top of the VAT / Heap Leach area reduces the evaporation exposure.

4.1.4 NEUTRALISING THE VAT/LEACH VESSELS

The VAT will be neutralised post the extraction process.

Two options exist for heap treatment:

- Washing of the material with diluted process solution and thereby reducing the acid or alkaline content in the material.
- Adding a neutralising agent for if acid is used as leach reagent in the form of liquid base.

The ILS pond will also be used as an evaporative pond to deplete the remaining heap solution. Any residual chemicals in the solution will be precipitated out in the process.

4.2 PHASE 2: FURTHER EXPLORATION, MINING AND PROCESSING OF MINED ORE

4.2.1 EXPLORATION

The further exploration for copper (and gold / silver) mineral will be done on the Sinclair mine area (only), within the red area indicated in Figure 1. The exploration activities will be conducted

in parallel with phase 1 of the project, as the existing ore stockpiles are removed from their current locations.

Exploration drilling is the process of removing rock samples from an area, where it is suspected there is mineralisation. There are various drilling methods available and Tulela will utilise the following where possible:

- Reverse circulation (RC) drilling and / or diamond-core drilling, depending on which prove most suitable for the local conditions.

A typical drilling pad/area will consist of a drill-rig, an area where the drill core and geological samples can be stored and a storage area for drill equipment, fuel and lubricants. The drilling pad / area is usually cleared and levelled and is approximately 10 x 10 m for RC and 6 x 6m for Diamond-core drilling. All drill-water will be collected in drill-sumps, which will be managed to prevent overflows. The water from the drill-sumps is recycled. Non-toxic and biodegradable drilling lubricant will be used.

Samples taken during drilling campaign will be sent away for analysis.

4.2.2 MINING

Tulela proposes to conduct relatively “small scale” mining activities at the existing Sinclair Mine, which is dependent on the future exploration results.

The possible open cast mine pit footprint could extend over an area of ± 7.8 ha. The open cast mining would be undertaken to depths ranging between ± 5 and 30 m depending the exploration results.

As per conventional open pit mining, this would include probable drill and blast followed by load and haul activities. The rate of drilling and blasting will be depending on the exploration results. Drilling rigs will be used to drill holes into the rock, which will be charged with explosives. These explosives will be detonated with remote controls, from a safe distance. Blasting will only be conducted during daytime hours.

Waste rock would be hauled to the waste rock dump (WRD). The waste rock would be the ‘non-ore bearing’ material overlaying the ‘ore bearing’ material mined from the open cast mine pit. The volumes of waste rock material is dependent on the future exploration results. An estimated $\pm 100,000$ ton waste rock might be produced. This material will also be used at mine closure to cover the leach vessels as explained above.

Some of the waste rock produced while doing surface treatment / levelling for the VAT/Heap leach will be used for construction of the VAT/Heap Leach facility.

The ore grade material will be hauled to the 'Plant feed stockpile' (similarly to the existing ore stockpiles).

Mining and hauling of ore grade material and waste rock will be limited to daytime hours.

4.2.3 PROCESSING OF THE MINED ORE

The future mined ore (from the open pits and potentially from the box cut) will be hauled to the 'Plant feed stockpile' and similarly crushed and screened and then processed in the proposed (multiple) VAT/Heap leach facility and SX, EW & Stripping Plant, as described in Section 4.1.

The estimated feed rate of ore to the crusher would be ± 50 t/hr and similarly to the VAT leach vessels.

The total estimated material to be processed during phase 2 is to be determined as part of the exploration process and estimations indicate 125,000 t material to be treated.

4.2.4 WATER REQUIREMENTS

Approximately 50 m³ per annum of water will be used for exploration and 40 000 m³ per annum (i.e. 90 to 120 m³/day) (excluding for human consumption) for the mining and processing activities.

Water will be sourced from nearby borehole(s) on the farm within the area of interest.

4.2.5 STORM WATER MANAGEMENT

SLR (Groundwater and Surface Water Specialists) developed, as part of their study, a conceptual Storm water Management Plan, which is presented in the EIA Scoping and Assessment Report.

Figure 3 shows the conceptual storm water design for the proposed mining area (i.e. facilities).

The current planned waste stockpile is located within a natural drainage which is not accepted under the environmental design standards, it is recommended to move the planned waste stockpile south to fall outside of the natural drainage as indicated in Figure 3.

Once the final infrastructure drawings and plans have been completed, the conceptual storm water plan can be updated to take into account the final layouts.

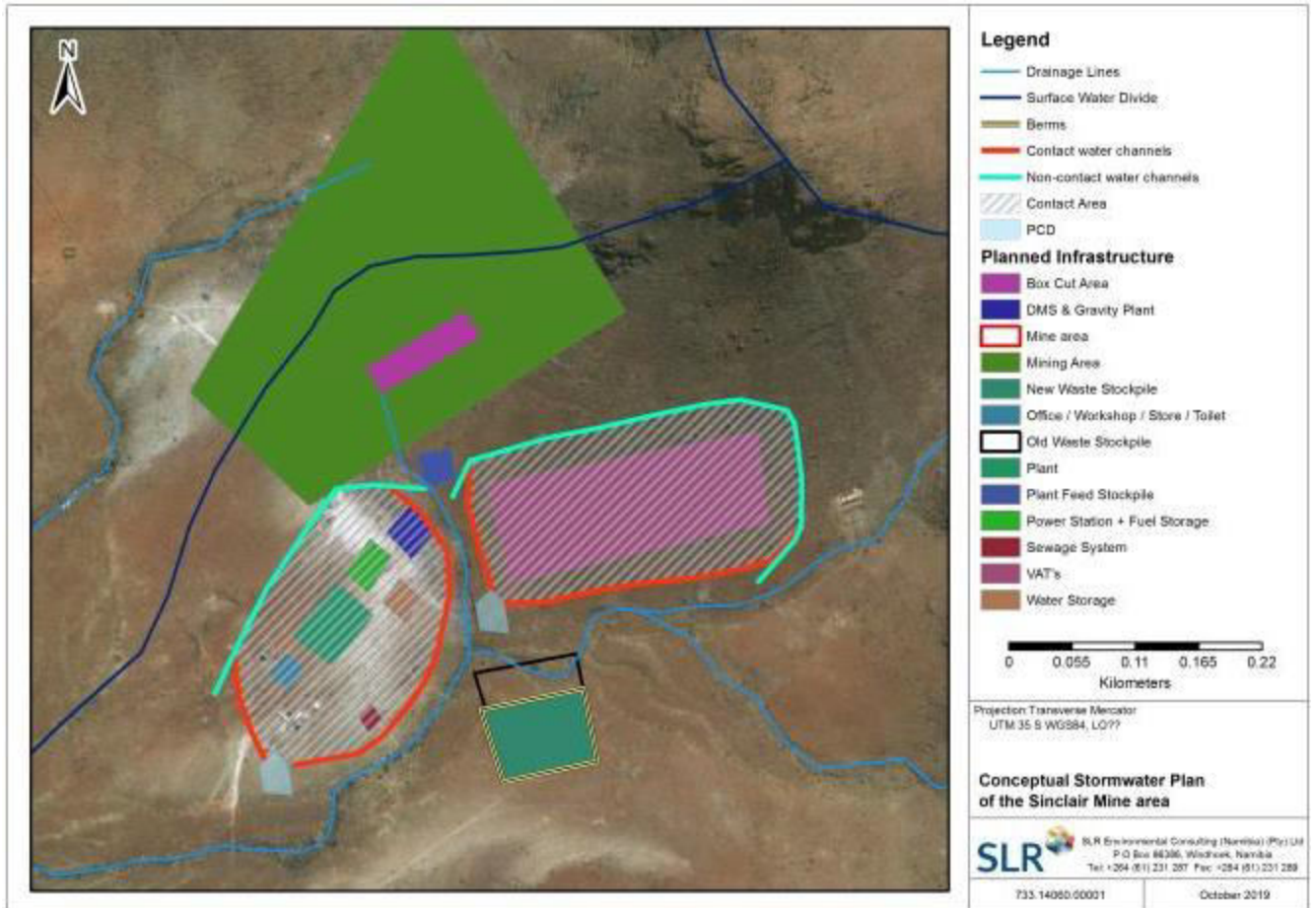


FIGURE 3: RECOMMENDED STORM WATER MANAGEMENT MEASURES

5 OVERALL ENVIRONMENTAL OBJECTIVES FOR THE EMP

The following overall environmental objectives have been set for the Sinclair Project

- To comply with national legislation and standards for the protection of the environment;
- To limit potential impacts on biodiversity through the minimisation of the footprint and the conservation of residual habitat as far as possible;
- To investigate and exploit measures to reduce water resources;
- To keep the owner of the Sinclair Farm and nearby surrounding farmers informed of mining and associated activities through the implementation of forums for communication and constructive dialogue;
- To limit contaminated effluent discharge into the environment through the containment, recycling or removal of contaminated water;
- To conserve soil resources by stripping, stockpiling and managing topsoil;
- To protect soils and groundwater resources through the implementation of measures for spill prevention and clean-up;
- To ensure the legal and appropriate management and disposal of general and hazardous waste, through the implementation of a strategy for the minimisation, recycling, management, temporary storage and removal of waste;
- To minimise the potential for dust emissions;
- To minimise the potential for noise disturbance in surrounding areas;
- To undertake rehabilitation wherever possible during the life of the mine;
- To incorporate final closure objectives in construction and mine planning;
- To develop, implement and manage monitoring systems to ensure good environmental performance in respect of the following: ground, air quality (i.e. dust), noise and biodiversity;
- To reduce potential impacts on the safety of the surrounding properties through strong site access controls and discouragement of informal settlements;
- To support and encourage environmental awareness and responsibility amongst all employees and service providers;
- To provide appropriate environmental education and training for all employees and service providers;
- To prevent pollution and clean up if incidents occur;
- To incorporate the relevant requirements stipulated in this EMP into the mine, plant process design and mine waste residue disposal;

- To ensure the all the employees and contractors adhere to the relevant management commitments; and
- Ensure compliance to the EMP.

6 MANAGEMENT PLANS

The management plans (MPs), listed in the table below are applicable to all the relevant activities and facilities of the Sinclair mine project. (The MPs follow in the subsequent sections).

Due to the fact that the various project phases will overlap to a certain extent, and the fact that the life of mine is quite short, all the management and mitigation measures present in this section need to be considered during all project stages, where relevant.

TABLE 6: VARIOUS MPS AND NUMBERS

Number	Management plan (MP)
6.1	Stakeholder Consultation/Communication MP
6.2	Safety and Security MP
6.3	Surface water/stormwater MP
6.4	Groundwater MP
6.5	Air Quality MP
6.6	Noise & Vibrations MP
6.7	Biodiversity MP
6.8	Visual MP
6.9	Archaeology MP
6.10	Traffic MP
6.11	Socio-Economic MP
6.12	Resource MP
6.13	Soil MP
6.14	Waste Management MP

6.1 Stakeholder Consultation/Communication MP

6.1 STAKEHOLDER CONSULTATION/COMMUNICATION MANAGEMENT PLAN

It is important that channels of communication are maintained over the life of the project for surrounding landowners and other relevant stakeholders.

6.1.1 COMPONENTS

This plan is made up of the following components:

- General Stakeholder communication.

6.1.2 MANAGEMENT AND MITIGATION

6.1.2.1 General Stakeholder communication

To ensure that sufficient opportunity for regular communication is provided on the relevant mining activities, together with feedback on the environmental management performance of the mine and that opportunity is provided for interested and affected parties (IAP) to continue to raise comments and concerns (complaints) on the same –as indicated in the IFC requirements.

The key IAP in this regard is the Sinclair Farm owner.

Actions

The issues surrounding the stakeholder communication can be summarised below along with the management commitment in order to resolve, manage or mitigate these issues. These commitments apply to all phases of the mining project.

Issue 1: Understanding who the stakeholders are

- Action 1: Maintain and update the stakeholder register. Ensure that all relevant stakeholder groups are included.
- Action 2: A representative database would include, as a minimum, surrounding farm owners.

Issue 2: Liaison with interested and affected parties in all phases of the life of mine

- Action 1: Devise and implement a stakeholder communication and engagement strategy. Regular meetings with the Sinclair Farm owner will be carried out (the frequency of the meeting will be determined between Tulela and the farm owner at the outset of the project).
Meetings with other neighbouring farmers to be arranged on an ad-hoc basis, depending specific complaints being raised. However, at the outset of the project, Tulela will engage with the immediate farm neighbours (as

a minimum) to inform them of the commencement of the activities and also to share relevant safety related information.

Issue 3: Managing perceptions, issues and/or complaints

- Action 1: Develop and implement a concerns/complaints (grievance) process for stakeholders and publicise the channels through which issues can be submitted to Tulela.
- Document all complaints in an external communications register;
 - Respond immediately to acknowledge receipt of complaints and comments;
 - Investigate and report on findings of issue to the complainant;
 - Keep complete auditable records of complaints, responses and actions taken; and
 - Introduce an independent mediator if the grievance / complaint cannot be resolved between Tulela and the affected party.

Issue 4: Safety of 3rd parties

- Action 1: Through appropriate communication and inductions, provide information to educate third parties about the dangers associated with hazardous excavations and infrastructure (refer to issue 2).

6.2 Safety & Security MP

6.2 SAFETY AND SECURITY MANAGEMENT PLAN

It is essential that safety and security measures are defined and implemented to adequately protect the mine site from being accessed by unauthorised people. An emergency response plan for incidents is also essential.

Note that a separate Occupational Health and Safety (OHS) Plan shall be developed for the mining activities which does not form part of this EMP.

6.2.1 COMPONENTS

This plan is made up of the following components:

- General (third party) safety and security;
- Construction and operational phase workers

6.2.2 MANAGEMENT

6.2.2.1 General (third party) safety and security

The objective of the mitigation measures is to prevent physical harm to third parties and animals from potentially dangerous excavations, infrastructure and associated activities.

Actions

Issue 1: Access of unauthorised people

- Action 1: Warning signs will be erected and maintained at the site boundary (and the entrance to the farm – i.e. the new access road) and the fence around the working area of the mine will be maintained.
- Action 2: Security control will be in place at the access point to prevent uncontrolled vehicle and pedestrian access.
- Action 3: Any persons entering the mine area will be required to undergo a formal induction.
- Action 5: Operate and publicise among all site workers and visitors a detailed security plan for the mine and neighbouring farms. The mine cannot lock workers in but it must inform all employees/contractors of the detailed consequences of anyone found in breach of the security measures. It must include a contingency plan to protect the local community if mine labour goes on strike.

Issue 2: Safety risks

- Action 1: Operate an alcohol and drug free site and include random testing of employees/contractors on entry to site, at the beginning of shifts and at any

time on duty. Random tests will also be conducted at the accommodation camp.

Action 2: Develop a detailed fire management policy and ensure all employees/contractors are regularly trained. In this regard (amongst others):

- No open fires must be allowed.
- Smoking in dedicated areas to avoid any veld fires.
- Conduct a risk assessment(s) to ensure potential field fires are avoided at all cost.

Action 3: Ensure all security personnel are well vetted and trained.

Action 4: Permanent aboveground waste facilities and stockpiles will be rehabilitated in a manner that they present as land forms that will be stable, protected from flood damage (designed, constructed and operated in a manner that stability (i.e. safety) is a priority). As far as is possible, the slopes will be re-vegetated. The permanent above ground facilities (i.e. the VATs and WRD) will be designed, constructed and operated in a manner that stability is a priority, flood protection is provided and the risk of failure is limited to acceptable levels.

Action 5: Any mining void that remain open will be made safe to ensure that there is no risk to the safety of people and animals.

Action 6: Collection of wood and any plant or animals species from the farms are forbidden.

Action 7: At closure, the open pit perimeters will be bermed off with available waste rock material and /or side walls must be sloped sufficiently, depending on safety requirements at closure. The viability of providing fencing as an additional measure will be investigated and agreed with the land owner. The pit walls will be made safe from both a stability and access perspective. In the event that people or animals cross the berm and enter the pits the mitigation measures will ensure that there will be no risk of pit wall failure and that there will be safe exit options available. In addition, permanent warning signs will be in place at appropriate intervals, in appropriate languages with danger pictures to warn people of the long term safety risks of entering the open pits.

Issue 3: Emergency

Action 1: Develop and implement an emergency response plan relating to third parties safety (i.e. hazardous excavations that can cause injury, etc.). This will be kept by the EHS department.

Issue 4: Blasting and fly rock

Action 1: A system will be designed to advise relevant neighbouring farmers of intended blasting times, in accordance with the rules of the use of explosives.

Action 2: Adequate notification will also be provided to mine workers, contractors and visitors.

Action 3: The blast design, implementation and monitoring will, as a general rule, ensure that:

- Ground vibration when blasting, must be less than 12mm/s peak particle velocity at the closest third party structures (Sinclair farm buildings);
- Air blast at the closest third party structures mentioned above must be less than 130dB;
- All registered complaints will be documented and, investigated by the Tulela Management team and efforts will made to address the area of concern where possible;

Issue 5: Handling storage, transport and use of hazardous substances (i.e. Sulphuric acid, etc.)

Action 1: All legal health and safety requirements will be implemented when transporting sulphuric acid and other hazardous substances to site.

Action 2: Transport companies will comply with all legal requirements for the handling and transport of hazardous substances.

Action 3: Storage facilities / tanks will comply with all relevant health and safety requirements applicable for Namibia.

Action 4: Major spillage incidents will be handled in accordance with the Sinclair mine emergency response procedure. Any significant spills will be reported to DWA within 24 hrs and corrective action taken.

Action 5: Induct all relevant employees and contractors in the mine's spillage management procedure

- Action 6: Enforce a zero tolerance policy on loitering on any privately owned farms. No outside visitors to the camp should be allowed.

6.2.2.2 Construction and operational phase worker (i.e. Accommodation camp)

Actions

Issue 1: 3rd party safety and security and workers safety and well being

- Action 1: See General (third party) safety and security
- Action 2: Occupants of the employee village will remain within the area after working hours.
- Action 3: Ensure all permanent buildings are suitable for the mine village and conform to Namibian Labour regulations and relevant standards on workers' housing.
- Action 4: Provide recreational and educational facilities, examples of these may include TV (and DSTV) and / or computers, internet and study area; as well as games area(s), to keep off-duty employees happily occupied, to reduce the risk of them interacting in the neighbourhood.
- Action 5: Reduce the number of shared rooms to a minimum to reduce the real risk of spreading HIV and other sexually transmitted diseases within the workforce and their families.
- Action 6: Ensure that laundry services are provided for all personnel on a daily basis.
- Action 7: Provide a comprehensive voluntary counselling and testing programme for all employees and contractors.
- Action 8: Implement a employee wellness programme, including HIV/AIDS information in all changing rooms.

6.2.3 OCCUPATIONAL HEALTH & SAFETY

Occupational health and safety aspects of the proposed Sinclair Project do not form part of this EMP. Tulela will however, adhere to all the relevant Namibian Legislation regarding health and safety, and implement a formal health and safety management system.

All hazardous chemicals used on site will have readily available material safety datasheets (MSDSs). Chemical hazards training will be an integral part of safety training and

induction. Procedures will be developed for the use and handling of all dangerous chemicals. Correct personal protective equipment will be supplied for the relevant work.

6.3

Surface Water MP

6.3 SURFACE WATER MANAGEMENT PLAN

Water is a scarce resource in Namibia, Tulela will undertake its operations to maximise the recycling and reuse of water.

6.3.1 COMPONENTS

This plan is made up of the following components:

- Storm water design requirements;
- Pollution of surface water;

6.3.2 MANAGEMENT

6.3.2.1 Conceptual storm water design requirements

Actions

Issue 1: Natural flow of storm water (clean and dirty) flowing from surrounding areas into operational area

- Action 1: Refer to section 4..2.5 of this EMP and section 4.2.4 of the EIA Scoping and Assessment Report for the conceptual storm water design for the proposed mining area. Once the final infrastructure drawings and plans have been completed, the conceptual storm water plan can be updated to take into account the final layouts.
- Action 2: The current planned waste stockpile is located within a natural drainage which is not accepted under the environmental design standards. Tulela must change their site layout/plan and move the planned waste stockpile south to fall outside of the natural drainage as indicated in Figure 3.

6.3.2.2 Impacts on surface water quality

The objective of the management measures is to prevent pollution of surface water run-off. These commitments apply to the design, construction and operation phases.

Actions

Issue 1: Contamination of surface water resources

- Action 1: Implement the following measure:
- Refer to section 6.3.2.1 regarding the storm water design.
 - Construct berms around the facilities to prevent runoff from rainfall to overflow and pollute the surface water

- Water quality is monitored to ensure that any discharge to the downstream drainage is of acceptable quality;
- Comply with lining / design requirements, as stipulated in the EIA Scoping & Assessment Report and section 4.1.2 of this EMP.
- Erosion protection, e.g. cover of VAT vessels with waste rock and top soil after project closure.
- Non-contact water be diverted around surface infrastructure and directed to the downstream river.
- Contact water to be diverted around infrastructure and collected in lined "Pollution control Dam" (PCD), to evaporate or be used to supplement process water.
- Collecting runoff from potential seepage sources to containment dams for reuse within mine;
- Design of diversion berms or channels and containment dams to deal with 1:50 year storm.

- Action 2: Install silt and oil traps at all areas where there is a possibility of contaminated water entering the environment. Ensure that these traps are regularly maintained / emptied and that the contents are disposed of at the relevant waste facility (waste oils, contaminated silt and effluent water).
- Action 3: All hazardous chemicals (new and used), dirty water, general waste are handled in a manner that they do not contaminate surface water run-off..
- Action 4: Develop an emergency response plan to ensure fast reaction to contain and remediate pollution incidents.
- Action 5: Ensure that contractors provide MSDS documents for all products brought to site, and that they have all the necessary hazardous protection equipment for people utilising the product, as well as the necessary equipment for the containment and clean-up of the environment in the advent of a spill.
- Action 6: Verify that the fuel transport company's spill containment (emergency clean up) plan and spill clean-up agreement are in place.
- Action 7: Ensure that fuel transporting companies adhere to the Petroleum Products and Energy Act (13 of 1990) and Regulations
- Action 8: Establish and maintain concrete or lined impermeable bunded areas around diesel generators, hazardous material stores, wash bays,

- workshop floors etc. Ensure drainage to oil and silt sumps that are regularly cleaned.
- Action 9: Develop, implement and maintain hazardous materials and hydrocarbon spill management procedures.
 - Action 10: Ad hoc spills will be cleaned up/remediated immediately in line with spillage management procedure.
 - Action 11: Place spill kits in all areas where hazardous substances are dispensed and stored and train staff to use it.
 - Action 12: Develop audit criteria for post rehabilitation in situ spills to ascertain when/whether the remediation has been successful.
 - Action 13: Major spillage incidents that contaminate flood waters will be handled in accordance with the Tulela's emergency response procedure and reported to the authorities as stipulated in the Namibian legislation.

Issue 2: Training and awareness

- Action 1: Induct all employees and contractors in Tulela's spillage management procedure.

Issue 3: Safe storage, disposal and rehabilitation of hazardous substance, including chemical, hydrocarbons, contaminated soils, etc.

- Action 1: Safely dispose of hydrocarbon contaminated material (i.e. hazardous waste).
- Action 2: Train selected staff in the remediation of soils or water contaminated by hydrocarbon spills.
- Action 3: All hazardous material will be safely stored in sealed drums on impermeable surfaces within bunded areas, preferably under rain proof cover. These areas will be designed to contain 110% of the volume of one or the largest (in a multi drum setup) drum and will be equipped with traps and oil separators to contain spilled hydrocarbons. The used hydrocarbon liquid waste will be provided to third parties for environmentally acceptable recycling thereof. Related records will be kept.

Issue 4: Monitoring of hydrocarbon and other hazardous substances spills

- Action 1: Ensure that checking for hydrocarbon spills is included in the daily inspections.

- Action 2: Report spillages as per the incident management procedure and Namibian legislation.

Please refer to Section 6.11 for management measures relating to waste management.

Spill remediation options include in situ treatment or disposal of hydrocarbon contaminated soils as hazardous waste. The former is generally considered to be the preferred option because with successful in situ remediation the soil resource is retained. The *in situ* options include bioremediation at the point of pollution, or removal of soils for washing and/or bio remediation at a designated area after which the soils are replaced. Soils contaminated with more hazardous materials should be disposed of at a registered hazardous landfill site.

Issue 5: Management of ablution facilities

- Action 1: Ensure recycling of discharge water back into the process stream.
- Action 2: Conduct regular monitoring to ensure that effluent is not being discharged into the environment.
- Action 3: Report spillages as per the incident management procedure and clean up spills within as soon as possible in line with the spillage management procedure.
- Action 4: In the event of domestic effluent discharge into the environment, stop the incident as soon as possible and find the root cause.
- Action 5: In the event of soil or water pollution, decontaminate the polluted area(s) using an appropriate methodology. Once clean, rehabilitate the area.
- Action 6: Ensure that toilets are working properly and are cleaned at least weekly, so they do not pollute the surrounding environment or create hygiene problems.
- Action 7: Regularly service and maintain sewage treatment system to keep it in proper working condition.
- Action 8: If the treated water is acceptable for discharge it will be reused. Under no circumstance will water that is not suitable for discharge be released to the environment.
- Action 9: Sewerage sludge shall be removed by the sewage services contractor for appropriate disposal at a licenced facility.
- Action 10: Apply to DWA for the STP and a possible Waste Water Discharge permit. Conduct regular inspections and audits relating to the STP activities and

ensure compliance to conditions of such possible permits issued by DWA (i.e. monitoring, etc.), where required.

Issue 6: Emergency Situation – breach of VAT/Heap Leach Vessels

- Action 1: Process material in the VAT/Heap Leach Vessels is in pulp or slurry form (not liquid), it will not flow when the vessels breach. However, emergency measures must be in place to address the breach of VAT vessels for containment and expedient repair of the vessels, removal of the material followed by rehabilitation of the site.
- Action 2: Refer to section 6.3.2.1 for the storm water management plan that must be in place to capture and contain the material onsite.

7.4 Groundwater MP

6.4 GROUNDWATER MANAGEMENT PLAN

Potential groundwater quality and quantity impacts are a potential issue during the construction and operation of the various mining activities and infrastructure, unless measures are undertaken to prevent and mitigate such impacts. The purpose of this groundwater management and mitigation plan is to provide for methods to be followed to achieve such mitigation.

6.4.1 COMPONENTS

This plan is made up of the following components:

- Water abstraction; and
- Contamination of groundwater.

6.4.2 MANAGEMENT

6.4.2.1 Water Abstraction

The objective of the management measures is to avoid / minimize potential impacts to third party groundwater users, to manage the proposed water demands and supply and to monitor and mitigate if required the loss of groundwater in supply boreholes due to these activities.

Actions

Issue 1: Reduction in groundwater levels:

- Action 1: Drilling of 2 production boreholes (see Figure 4) at the mine site in order to supplement the water supply from borehole WW70293 and reduce the impact on the groundwater level around that borehole on farms Sinclair and Aubures.
- Action 2: The combined abstraction from all (three) production boreholes must not exceed the required maximum volume of 120 m³/day or 40,000 m³/annum.
- Action 3: The borehole head design should include an inlet directly into the casing with a 25 mm diameter dipper tube, to allow for groundwater level monitoring.
A flowmeter must be installed to monitor and record groundwater abstraction.
- Action 4: Further, the groundwater management plan forming part of this assessment includes monitoring of boreholes (see section 8.1.1 for more details).

- Action 5: Process water must be recycled where possible and ('environmental safe') dust suppressants be used instead of water, where required (refer to Air Quality MP).
- Action 6: In the event that groundwater abstraction for mining activities has been proven to affect other users (impact must be proven to be caused by mining operations through continuous groundwater level monitoring of production borehole(s) and farm monitoring borehole(s)) contingency water supply should be in place, at the cost of the Cathral Investments / Tulela, such as trucking water from a reliable source or deepening/replacement of existing farm borehole.
- Action 7: In case water levels in production boreholes drop to levels deeper than expected, pumping rates should be reduced to stabilise the water level.
- Action 8: Groundwater monitoring should be initiated to include abstraction volumes, water levels and groundwater quality. Detailed programme should form part of the monitoring plan. To that effect:
- Two boreholes should be drilled at the mine. One to replace an old existing production borehole (now filled with rocks) and another downstream of the mine development, and
 - The borehole head design should include an inlet directly into the casing with a 25 mm diameter dipper tube, to allow for groundwater level monitoring.
- Action 9: Groundwater level monitoring should extend to selected boreholes on farms Sinclair and Aubures:
- Water levels of production and monitoring boreholes should be measured on a weekly basis, while water levels in selected farm boreholes should be measured on a quarterly basis.

6.4.2.2 Impacts on Groundwater Quality

The objective is to avoid, as far as possible, seepage from potential pollution sources that could result in elevated concentrations of major ions and impact the groundwater resource.

Actions

Issue 1: Groundwater contamination

- Action 1: The risk could be minimized by managing operations at pollutions sources to ensure that there are no seepages or overspills into the ground.
- Action 2: Put storm water management in place (refer to section 6.3).
- Action 3: Closed VAT system to prevent seepage of pregnant solution (alkaline or acidic) into the underground.
- Action 4: Neutralization of the VAT vessels after copper and potentially other byproducts (gold, silver) have been extracted.
- Action 5: Cover of VAT vessels with waste rock and soil after mine closure to prevent erosion and potential pollution of surface water and subsequently groundwater in the long term.
- Action 6: Install 2 monitoring/production boreholes on the perimeter of the planned infrastructure for establishment of a groundwater baseline and to early detect potential groundwater pollution:
- Water quality of on-site monitoring boreholes should be sampled and analysed quarterly and water quality of selected farm boreholes (downgradient of the mining operations) biannually.
- Action 7: Post closure rehabilitation of potential seepage sources with vegetation cover (stock piling of suitable topsoil) and/or plastic liners (depending on monitoring results) to further minimise the risk of seepage by reducing rainfall infiltrations.
- Action 8: The risk hydrocarbon / chemical spillages could be minimized by managing operations at pollutions sources such as fuel / chemical storage and wash areas as well as maintaining site checklist of fuel operations and chemical handling & storage on site to ensure that there are no seepages or overspills into the ground through leaks / spills.
- Action 9: Construction of concrete lined and bunded refuelling areas, drip pans under trucks, excavators, etc. during refuelling.
- Action 10: Quick response to clean up after oil or hydrocarbon spill. Waste materials should be dumped off site at a suitable landfill site.
- Action 11: Exploration boreholes should be capped or alternatively backfilled with local rock material to prevent long-term pollution of the groundwater after exploration.
- Action 12: VAT/Heap leach facility and PCD to be lined with long-term durable lining to prevent seepage of contaminants into the groundwater.

- Action 13: Mining activities must stay above the water table (which is to be determined prior to mining activities commencing). In the event that mining operations change after project implementation the EIA should be amended and the assessment and the assessment will require additional groundwater studies to determine the potential impacts.

6.4.2.3 Design criteria relating to groundwater quality

The following design criteria recommendations have been made:

- Action 1: Refer to section 4.1.2 and the Surface Water MP for the lining requirements of the VATs.
- Action 2: Standardised lined and bunded storage in the form of warehousing and tanks for process chemicals like acids/caustic soda should be constructed as well as maintain a proper stock list for the use chemicals to ensure that no spills or seepage onto the ground occurs.

6.5

Air Quality MP

6.5 AIR QUALITY MANAGEMENT PLAN

6.5.1 COMPONENTS

This plan is made up of the following components:

- Air Pollution

6.5.2 AIR POLLUTION MANAGEMENT

The objective is to limit the mine's contribution to air pollution impacts.

Actions

Issue 1: Air pollution

- Action 1: A register for complaints relating to air quality should be maintained. It must include the name, contact and affiliation details of the complainant, the date of the complaint, the date and time of the pollution incident, and a detailed description of the incident. In response to a complaint, Tulela should investigate possible causes and if required make use of a specialist to determine the likely source through a site inspection. Remedial actions to prevent such events in future should then be taken.
- Action 2: An air quality monitoring programme shall be implemented. Refer to section 8.1.2 for details.
- Action 3: Since the exceedance of air quality criteria is unlikely at the closest receptor, essential mitigation requirements for dust emission are minimal and only include those to be included as part of equipment design. These are:
- The enclosure of the crushers and screens with dust extraction and fabric filters will reduce dust emissions from crushing and screening by 83% (DEWHA Australia, 2019).
 - Diesel vehicles and generators must be fitted with catalytic converters to reduce NOx emissions and particulate filters for PM emissions.
- Action 4: Refer to the Noise and Air Quality Assessment Report (Appendix F) for other "good practice measure" as and when required.

6.6 Noise MP

6.6 NOISE AND VIBRATION MANAGEMENT PLAN

6.6.1 COMPONENTS

This plan is made up of the following components:

- Noise pollution

6.6.2 MANAGEMENT

6.6.2.1 Noise pollution management

The objective of the measures is to limit noise impacts.

Actions

Issue 1: Noise Pollution - general

Action 1: Tulela must establish and maintain a complaint register where interested and affected parties can lodge noise related complaints. The register, to be kept at the main security access, should include the name, contact and affiliation details of the complainant, the date of the complaint as well as the date and time of the disturbing event, the location where the event was observed, a detailed description of the event including details such as noise character, impulsiveness and tonality.

In response to a complaint, Tulela should investigate possible causes and if required make use of a specialist to determine the likely source through monitoring and/or a site inspection. Remedial actions to prevent such events in future should then be taken.

Action 2: A noise monitoring programme shall be implemented. Refer to section 8.1.4 for details.

Action 3: Refer to the Noise and Air Quality Assessment Report (Appendix F) for other “good practice measure” as and when required.

Issue 2: Mobile mining equipment and generator noise

Action 1: From the source inventory it was evident that mobile diesel mining equipment and the 1 MW diesel generator will be most notable if uncontrolled.

Action 2: To reduce the impact of mobile mining equipment the following recommendations apply specifically:

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Maintain internal road surfaces and avoid steep road gradients.
- Use rubber linings in chutes and dumpers to reduce impact noise.
- Minimize drop height of materials.
- Start-up equipment sequentially rather than simultaneously.
- Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on nearby sensitive receptors.

Issue 3: Generator noise

Action 1: Noise from diesel generators should be controlled to ensure occupational noise limits (typically 85 dBA) are met. This will require the enclosure of units within acoustically insulated containers or buildings. Air intake and exhaust mufflers must be installed. Exhausts must be directed away from sensitive receptors.

Issue 4: Blasting noise (when applicable)

Action 1: To reduce the impact of blasting, blasting schedules should be communicated with the public, i.e. the Sinclair farmhouse and visitors to Aubures campsite. A sign along the C27 at the access road intersection could be an effective measure to communicate the schedule to visitors to, and residents of the area.

6.7

Biodiversity MP

6.7 BIODIVERSITY MANAGEMENT PLAN

To understand biodiversity one must appreciate all of its components. It is not just about the species of plants and animals and the different habitats in which they live (biodiversity patterns), but also the way that factors, such as wind, water, steepness of slope and presence of pollinators, affect the habitats and the species living in them (ecosystem processes).

The commitments derived from the Scoping Report with regards to Biodiversity form the basis of this MP.

6.7.1 COMPONENTS

This plan is made up of the following components:

- Managing the general disturbance and physical destruction of biodiversity;
- Managing impact on topsoil; and
- Impact on biodiversity due to groundwater abstraction.

6.7.2 MANAGEMENT

6.7.2.1 General disturbance and physical destruction of biodiversity and topsoil

The objective of the mitigation measures is to prevent, as far as is possible, the unacceptable loss of biodiversity (and topsoil) and related functionality. The following management and mitigation measures also apply to the Accommodation Camp.

Actions

Issue 1: Destruction of organisms and their habitats

- | | |
|-----------|--|
| Action 1: | Keep the overall development footprint as small as possible. |
| Action 2: | The extent and location of the construction site should be fenced and all construction activities should take place within the fence. Adherence should be strictly enforced. |
| Action 3: | All roads and tracks must be planned in order to minimise fragmentation or disturbance of habitats. |
| Action 4: | Anti-erosion measures must be taken where roads and tracks cross a wash or drainage. |
| Action 5: | Carefully plan the placement of stockpiling construction material so as to avoid mature trees and shrubs where possible. |
| Action 6: | Place infrastructure around the three <i>Aloe dichotoma</i> trees in the processing area. |

- Action 7: If impossible to save the *Acacia erioloba* and *Parkinsonia Africana* in the operational area, permits are required before these two trees may be removed.
- Action 8: Limit construction activities to daytime hours to reduce noise. Refer to the noise specialist report for further management and mitigation measures.
- Action 9: Train construction and permanent staff as to their environmental obligations. All contractors should be held responsible for transgressions and significant penalties should be levied in order to ensure compliance.
- Action 10: Do not put water tanks, power pylons or any other large infrastructure in the river or washes.
- Action 11: No sewerage overflow may be placed within 100 m of a wash or river.
- Action 12: Identify nests, dens and other breeding locations, demarcate them and avoid these sites.
- Action 13: Reptiles and amphibians that are exposed during ground clearing should be captured for translocation by a qualified expert.
- Action 14: No collection of plants should be allowed. No fires should be allowed.
- Action 15: It is essential to make financing available for a restoration plan, and to implement restoration immediately after construction has stopped.

Issue 2: Disturbance of animals and interference with their behaviour

- Action 1: The extent of the operation should be clearly demarcated on site layout plans, and on the ground it should be either fenced in or marked with clear signposts.
- Action 2: Areas surrounding the mine, processing plant and exploration sites that are not part of the demarcated development should be considered no-go zones. No employees, visitors, vehicles or machinery should be allowed in such zones.
- Action 3: No off-road driving or driving next to established roads/tracks should be allowed.
- Action 4: Limit activities to day-time hours so as to reduce noise.
- Action 5: No fires allowed.
- Action 6: No collection of plants for firewood or any other purpose allowed.

Issue 3: Light impact on animals

- Action 1: Install motion detectors to limit light use to the minimum, where possible.
- Action 2: Outdoor lights should be directed downwards and not up into the sky.

- Action 3: Use yellow or amber outdoor lights because invertebrates don't detect yellow light as well as white.
- Action 4: Install insect screens in doors and windows located in buildings that are used at night.

Issue 4: Alteration of topography

- Action 1: It may not be possible to rehabilitate the site significantly, but a comprehensive restoration plan would mitigate impacts to some extent.
- Action 2: Financing should be available for the restoration plan.
- Action 3: A comprehensive restoration plan must be drawn up by an expert as part of the Mine Closure Plan. Some rehabilitation actions must be implemented during construction / operations in order to be effective, e.g. removal and storage of topsoil (refer to "Issue 5" below).
- Action 4: Implement the restoration programme as soon as possible after an impact has ceased.
- Action 5: Rehabilitation of historical exploration and mining sites that fall outside the proposed project area (e.g. at the northern foot of the northernmost hill) will have a positive effect on biodiversity.

Issue 5: Impact on of soil; death of organisms

- Action 1: Refer to sections 6.3 and 6.4
- Action 2: Containment measures as proposed should be strictly enforced to the highest standards.
- Action 3: The VATs and ponds should be sealed completely and provide no opportunity for either leakage or entry by animals.
- Action 4: Constant monitoring of the leach ponds and its associated pipes, lining and covers is essential to ensure that there is no malfunction, tear or opening.
- Action 5: As one VAT becomes worked out and its solution is pumped to the next, it should be neutralised and covered with waste rock and lastly topsoil (on top of the plastic liner), immediately.
- Action 6: Treatment of the final discharge of water should be in such a way as to eliminate any possibility of active chemicals entering the soil or groundwater.
- Action 7: Any evaporation pond should be lined at bottom and sides with an impervious lining to prevent soil contamination.

Monitor the impacts on birds as a result of the evaporation pond and depending potential issues, an engineering design to cover the pond to be considered.

- Action 8: Stripping of topsoil will only occur where soils are to be disturbed by proposed activities/facilities and where a clearly defined end rehabilitation use for the stripped soil has been identified. This includes (amongst others) the topsoil where the permanent VAT/Heap leach facility and the WRD will be located.
- Action 9: Soils should preferably be handled in dry weather conditions so as to cause as little compaction as possible. Utilisable soil (topsoil) must be removed and stockpiled separately from the lower "waste rock."
- Action 10: The "Utilisable" soil should be stripped to a depth of ± 300 mm where possible or until hard rock/calcrete is encountered. These soils will be stockpiled together with any vegetation cover present (only large vegetation to be removed prior to stripping).
- Action 11: Topsoil stockpiles will be demarcated, and clearly marked to identify both the soil type and the intended area of rehabilitation.
- Action 12: Equipment, human and animal movement on the soil stockpiles should be limited to avoid topsoil compaction and subsequent damage to the soils and seedbank.
- Action 13: Stockpiled topsoil will be used to rehabilitate disturbed sites either ongoing as disturbed areas become available for rehabilitation and/or at closure. The stockpiled topsoil must be placed on the rehabilitated areas to ± 300 mm deep and contoured to achieve an approximate free draining surface profile.
- Action 14: The stockpiled soils will be analysed to determine the nutrient status and chemistry. Based on the analysis, fertilisers will be applied if necessary.
- Action 15: Erosion control measures will be implemented to ensure that the soil is not washed away and that erosion gulleys do not develop prior to vegetation establishment.
- Action 16: If soil (whether stockpiled or in its undisturbed natural state) is polluted, the first management priority is to treat the pollution by means of in situ bioremediation.

6.8

Heritage / Archaeology MP

6.8 HERITAGE / ARCHAEOLOGY MANAGEMENT PLAN

In summary, the heritage assessment concluded that the main issue concerning the heritage resources of the proposed Sinclair Project area is the disturbance or destruction of historical mining remains. However, the historical remains at Sinclair Mine are not of high significance and should not present an obstacle to the implementation of the project.

Therefore, there are no reasonable possibility to mitigate these impacts. However, in the event that the proposed Sinclair Project does proceed it will disturb or destroy historical remains at the Sinclair Mine, Tulela should notify the National Heritage Council.

6.9 Traffic MP

6.9 TRAFFIC MANAGEMENT PLAN

Even though the potential road traffic impacts associated with the proposed Sinclair Project are not considered significant, relevant “good proactive management and mitigation measure are provided in the MP.

6.9.1 COMPONENTS

This plan is made up of the following components:

- New access and C27 intersection; and
- Infrastructure – road use.

6.9.2 MANAGEMENT OBJECTIVES

The objective of the management measures is to increase safety and reduce the potential for vehicle related impacts on road users.

Actions

Issue 1: Access Road / C27 intersection

- Action 1: Tulela will liaise with the Namibia Roads Authority to ensure safe entrance to the site. A single entrance to the mine to be positioned at a location with adequate sight distance, signage, etc.

Issue 2: Road use

- Action 1: A driver trainer programme for all Tulela employees will be implemented to include: complying with speed limits, holding valid licences, ensuring vehicles are roadworthy, zero tolerance for drinking and driving and using lights appropriately for night driving.
- Action 2: All road users are required to comply with Namibian Roads Authority regulations.
- Action 3: Tulela to liaise with the Roads Authority concerning the roads leading to and from Sinclair mine, as and when required. Any maintenance to the roads will be determined by the Roads Authority.
- Action 4: At points where water accumulates on the roads, the installation of culverts will be investigated as a priority over the general packing of gravel and
- Action 5: Any mine related road accident must be handled in accordance with the emergency response procedure.
- Action 6: All legal health and safety requirements will be implemented when transporting hazardous substance (see section 6.2).

6.10 Socio-economic MP

6.10 SOCIAL AND ECONOMIC MANAGEMENT PLAN

The activities associated with the mine have socio-economic impacts in all mine phases – some positive and some negative. These impacts related to amongst others employment/job creation, inward migration of potential job seekers, local- and regional economies, land use and surrounding landowners and community safety and security. This MP aims to provide measures to enhance the positive impacts and limits the negatives impacts.

6.10.1 COMPONENTS

This plan is made up of the following components:

- Economic Impacts;
- Job creation and skills development;
- Community health, safety and security; and
- Social issues relating to closure.

6.10.2 MANAGEMENT

6.10.2.1 Economic Impact

To increase the multiplier effect on the Namibian economy and thereby support the country's national objective of sustained economic growth.

Actions

Issue 1: local, regional and national economy

- Action 1: Promote opportunities to maintain open communication channels with the land owner and local business in the area/region to seek win:win opportunities for business growth, e.g. to produce and deliver goods and services at a fair price.
- Action 2: Have procurement policies that give preference to the purchase of Namibian-made goods and services whenever possible.
- Action 3: Pay fair salaries and wages.
- Action 4: Develop a grievance procedure which it will publicise to neighbours and relevant stakeholders, so that issues and concerns can be addressed adequately and promptly.

6.10.2.2 Job creation

To increase the multiplier effect on the Namibian economy and thereby support the country's The enhancement objective is to maximise employment and skills development opportunities for the regional and national population.

Actions

Issue 1: Job creation and skills development

- Action 1: Recruit a mine manager who must be an 'approachable person' as she/he will be a key link between the farmers in the area and the mine.
- Action 2: Demonstrate its efforts, and those of its contractors, to recruit employees from Berseba Constituency and Karas Region.
- Action 3: Weight tender selection in favour of contractors and suppliers of goods and services which employ Namibians and Namibian suppliers down the supply chain.
- Action 4: Be gender sensitive and select women for interview, training and recruitment, where possible.
- Action 5: Ensure that the mine closure plan is understood by the workforce and guarantees final salary pay-outs and pension transfers.

6.10.2.3 Community health, safety and security

The mitigation objective is to avoid incidents that could impact on community health, safety and security of the surrounding area.

Actions

Issue 1: Community health, safety and security

- Action 1: Refer to sections 6.2, 6.5 and 6.6.

6.10.2.4 Social issues relating to closure

Actions

Issue 1: Closure

- Action 1: Ensure there is a conceptual Mine Closure Plan in place long before the closure of the mine. This is essential, given the very short lifespan of the mine.
- Action 2: Ensure skills upgrading during employment at mine is documented where possible so skills are recognised with future employers.

Action 3: Ensure that the mine closure plan is understood by the workforce and guarantees final salary pay-outs and pension transfers.

6.11 Waste MP

6.11 WASTE MANAGEMENT PLAN

Waste is generated during all phases of the mine. This MP deals with solid waste management.

6.11.1 COMPONENTS

This plan is made up of the following components:

- Non-hazardous solid waste (non-mineralised);
- Hazardous solid waste (non-mineralised); and
- Medical waste.

Waste Inventory list:

Waste type	Possible waste specifics (i.e. example of waste types)*
Non-hazardous solid waste (non-mineralised)	Metal Cut offs, rubber, wood, product packaging, organic materials, glass, plastics, food scraps, cardboard/paper, used PPE, etc.
Hazardous solid waste (non-mineralised).	Printer cartridges, sewerage, batteries, hydrocarbons (oils, grease), fluorescent bulbs, etc.
Medical waste	Syringes, material with blood stains, bandages, etc.

Note:

Tulela might identify more waste types during the project execution.

6.11.2 MANAGEMENT

6.11.2.1 Non-hazardous solid waste (non-mineralised) objectives

The objective of the management measures is to ensure proper storage, recycling, re-using, removal, transportation and disposal of non-hazardous solid waste.

Actions

Issue 1: General

- Action 1: Tulela will develop a waste management procedure that will cover the recycling, re-use, storage, handling, transportation and disposal. Ensure that the contractor's responsible for the above are made aware of these procedures.

Issue 2: Collection, storage and disposal of non-hazardous waste

- Action 1: 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. Receptacles must have lids to prevent wind borne litter, or scavenging by animals.
- Action 2: Recyclable waste will be sent to a reputable recycling company. The remainder of the waste will be disposed at a licenced landfill site off site
- Action 3: Washed/neutralised drums are to be separated into salvageable and non-salvageable groups.
- Action 4: Non salvageable drums (and drums that contained hazardous materials) will be cleaned, flattened and sold as scrap or disposed of as above.
- Action 5: Non-recyclable waste will be collected and taken to an off-site waste facility.
- Action 6: Scrap metal will be sold to a reputable company.
- Action 7: Consider using a press on site to press relevant waste material before storage and disposal.
- Action 8: Avoid foamalite packaging for food container on site.
- Action 9: Obtain agreement from the landowner regarding safe disposal of concrete and building rubble (excluding waste) on a dedicated area on the proposed ML area (i.e. within the WRD or in the box cut and then cover it with waste rock material). This does not include waste (wet) cement.

6.11.2.2 Hazardous solid waste (non-mineralised) objectives

The objective of the management measures is to ensure proper storage, removal, transportation and disposal of hazardous solid waste.

Actions

Issue 1: General

- Action 1: The waste management procedure for Tulela will cover the storage, handling, and transportation of waste. Ensure that the contractor's responsible are made aware of these procedures.

Issue 2: Collection, storage and disposal of hazardous waste

- Action 1: Designated waste collection points will be established on site for hazardous waste. Care will be taken to ensure that there will be sufficient collection points with adequate capacity.

- Action 2: Hazardous waste will be disposed of at a permitted hazardous waste disposal site (most likely in Windhoek).
- Action 3: The yard will have a dedicated area for used oil / chemicals storage that will include an impermeable concrete slab, bunding, an oil trap and sump.
- Action 4: Used oil will be sent to a reputable recycling company for recycling.
- Action 5: Materials contaminated with oils and greases will be disposed of at a permitted hazardous waste disposal site.
- Action 6: All explosive bags are to be collected together and safely burnt at the dedicated site (i.e. magazine site) according to permit conditions and procedures, where applicable.
- Action 7: Ensure that hazardous waste is kept covered, in impermeable bunded areas until it can be removed from site to the hazardous waste facility.
- Action 8: Store fluorescent tubes (if any) in a special labelled steel drum at the engineering workshop.
- Action 9: 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).

6.11.2.3 Medical waste

The objective of the management measures is to ensure proper storage, removal, transportation and disposal of medical waste.

Actions

Issue 1: Collection, storage and disposal of hazardous waste

- Action 1: Incinerate the medical waste offsite at an approved medical facility.

7 PARTIES RESPONSIBLE FOR THE IMPLEMENTATION OF THE EMP

This section describes the roles and responsibilities for implementing the various management plans.

7.1 CATHRAL INVESTMENTS / TULELA GENERAL MANAGER (GM)

The Cathral Investments / Tulela GM shall ensure compliance to this EMP. The EMP will be part of the contract with all contractors working on the project.

7.2 TULELA SITE / MINE MANAGER/SUPERVISOR

The Tulela Site / Mine Manager has overall responsibility for environmental management on the mine and for ensuring this EMP is implemented. To assist the Mine Manager, the Sinclair mine project will have an Environmental Officer (or dedicated person responsible for environmental management activities on site) that will be dedicated to managing and monitoring the environmental issues associated with the mine's activities.

The General Manager must ensure the environmental management plan is included in all contracts and to ensure that contractors adhere to the conditions of the EMP.

Contract documents should consider the inclusion of penalties for non-conformance to the EMP, or to link the sign off of the Contract to a retainer clause. The client retains part of the contract fees until the Mine Manager has signed off the clearance certificate, indicating satisfaction with the rehabilitation of the Contractor's work and laydown area.

7.3 ENVIRONMENTAL OFFICER

The Environmental Officer will be responsible for assisting the Mine Manager 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, decommissioning and closure phases.

In addition to the above, the Environmental Officer is responsible for ensuring that all persons involved with the Sinclair mine comply with this EMP.

The Environmental Officer will be responsible for the following aspects related to compliance of this EMP:

- Regular inspections and auditing compliance to this EMP and any other relevant legal requirements e.g. permits and authorisations.
- Conduct environmental awareness training during induction training and on an ad hoc basis thereafter.
- Conduct scheduled monitoring as outlined in section 9 as well as any additional monitoring required by permit and authorisations issued to Sinclair mine by relevant authorities.
- Ensure compliance to this EMP and permits and authorisations issued to Sinclair mine by relevant authorities. Ensure responsibilities and target dates are developed for each one of the commitments in this EMP.
- Submit required information to relevant authorities such as reporting related to monitoring and with regard to compliance with the EMP, permit and relevant authorisations.
- Liaise with the Mine Manager on environmental management (where required).

7.4 CONTRACTORS

All contractors and their sub-contractors and employees will be contractually required to comply with the relevant commitments in this EMP.

7.5 EXTERNAL SPECIALISTS

Tulela may appoint an external environmental specialist, as and when required, to assist with the implementation of certain commitments made in the various management plans.

An independent auditor will also assess compliance against the EMP on an annual basis.

7.6 REPORTING

Bi-annual Environmental Reports need to be prepared and submitted to MET and the Sinclair Farm Owner.

8 MONITORING AND AUDITING

8.1 MONITORING

The management plans in Section 6 have covered various aspects of the proposed monitoring. This section both augments those requirements and sets further detail where relevant. Tulela will develop monitoring procedures including the relevant monitoring commitments spelled out in this EMP.

As a general approach, the monitoring procedures will comprise the following:

- A formal procedure;
- Appropriately calibrated equipment – regular inspections and calibration of equipment will be undertaken in line with the equipment calibration/validation procedure;
- Where samples require analysis, they will be preserved according to laboratory specifications;
- Where practical, an accredited, commercial laboratory will undertake sample analyses;
- Parameters to be monitored can be identified in consultation with a specialist in the field and/or the relevant authority;
- If necessary, following the initial monitoring results, certain parameters may be removed from the monitoring programme in consultation with a specialist and/or the relevant authority and/or the Sinclair Farm owner and neighbouring farmers, where applicable.;
- Monitoring data will be stored in a structured database;
- Data will be interpreted and reports on trends in the data will be compiled on a quarterly basis; and
- Both the data and the reports will be kept on record for the life of mine.

As a general comment, if monitoring points become damaged or redundant then they can be replaced with new points.

8.1.1 GROUNDWATER MONITORING

Groundwater monitoring should be carried out to include abstraction volumes, water levels and groundwater quality thereby developing the baseline and long-term database. A monitoring plan is given as follows:

- Monthly monitoring of groundwater levels outside the mining area of all other farm boreholes on Farm Sinclair; as well as WW70289 and WW70286 (or other nearby

boreholes as agreed with the farmer) on the Farm Aubures shown in Figure 5 should be done.

- Further, on Farm Sinclair two boreholes should be monitored as follows (Figure 5):
 - Groundwater quality in , WW70296 (solar pump) and
 - Quality only for the 'garden borehole' (Wind pump) located in the Aubures River downgradient of the mine
- Daily monitoring of groundwater abstraction, weekly water level (rest and pump water levels) as well as quarterly quality monitoring of the production boreholes supplying the mine (Figure 4).

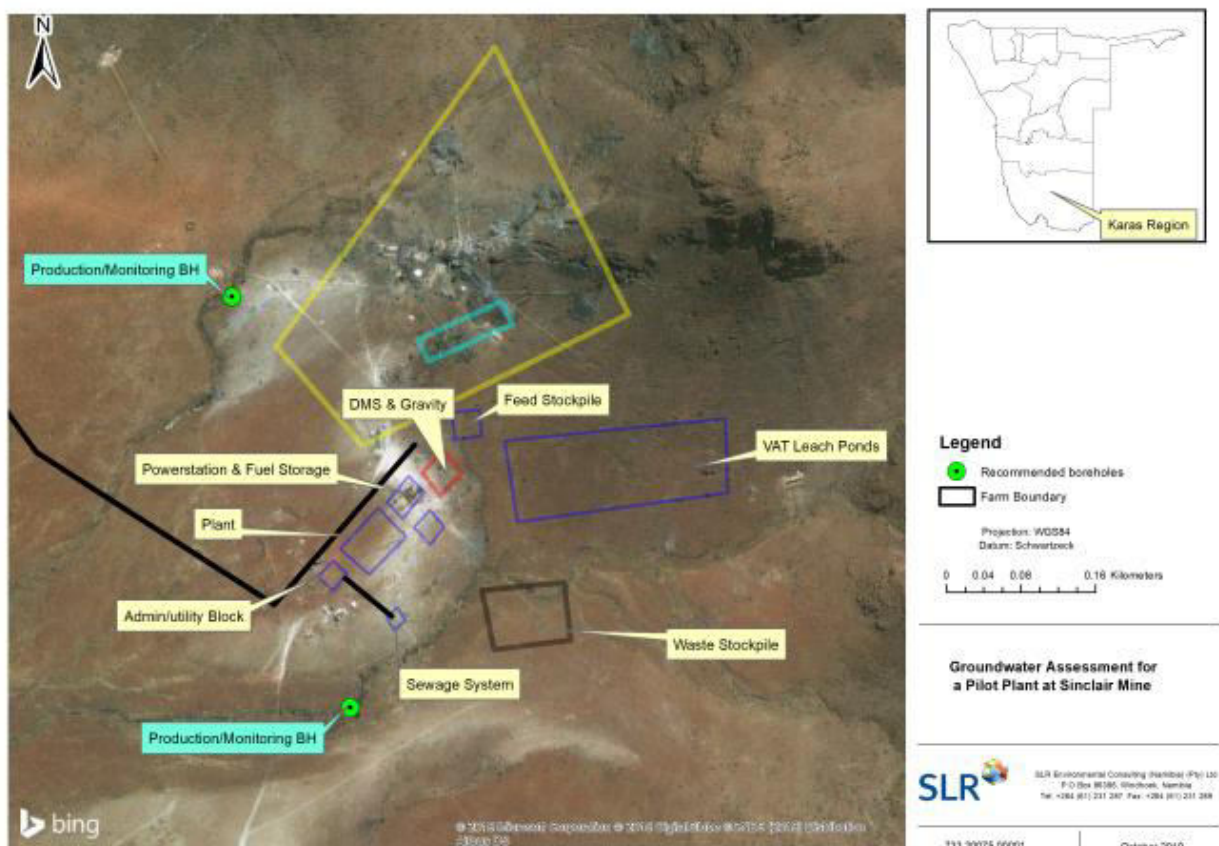


FIGURE 4: SITE INFRASTRUCTURE AND RECOMMENDED NEW MONITORING BOREHOLES WITHIN THE MINING AREA

TABLE 7: RECOMMENDED GROUNDWATER MONITORING SCHEDULE

Borehole ID	Location	Groundwater level monitoring		Groundwater quality	Production volumes/Water meter
		Monthly	Weekly		
				Quarterly	Daily
New BH1	Sinclair Mine	X	X	X	X
New BH2	Sinclair Mine	X	X	X	X
WW70296 (solar pump)	Farm Sinclair	X		X	
Other farm Sinclair borehole(s)	Farm Sinclair	X			
Production borehole WW70293	Farm Sinclair	X	X	X	X
Garden borehole (wind pump)	Farm Sinclair	X		X	
WW70299	Farm Aubures	X			
WW70286	Farm Aubures	X			
Alternative borehole	Farm Aubures	X			

TABLE 8: RECOMMENDED PARAMETERS FOR GROUNDWATER QUALITY MONITORING

Metals		Major Ions	
Lanthanum as La*	µg/l	Sulphate as SO ₄ ²⁻	mg/l
Tungsten as W*	µg/l	Nitrate as N	mg/l
Iridium as Ir*	µg/l	Nitrite as N	mg/l
Platinum as Pt*	µg/l	Sodium as Na	mg/l
Gold as Au*	µg/l	Potassium as K	mg/l
Thallium as Tl*	µg/l	Magnesium as Mg	mg/l
Lead as Pb*	µg/l	Calcium as Ca	mg/l
Bismuth as Bi*	µg/l	Stability pH, at 25°C	
Thorium as Th*	µg/l	Langelier Index	
Sodium as Na*	µg/l	Ryznar Index	
Magnesium as Mg*	µg/l	Corrosivity ratio	
Aluminium as Al*	µg/l		
Silica as Si*	µg/l		
Phosphorous as P*	µg/l		
Sulphur as S*	µg/l		
Calcium as Ca*	µg/l		
Titanium as Ti*	µg/l		
Vanadium as V*	µg/l		
Zinc as Zn	µg/l		

Mercury as Hg	µg/l	
Iron as Fe	µg/l	
Manganese as Mn	µg/l	
Arsenic as As	µg/l	
Cadmium as Cd	µg/l	
Cobalt as Co	µg/l	
Cyanide as Cn	µg/l	

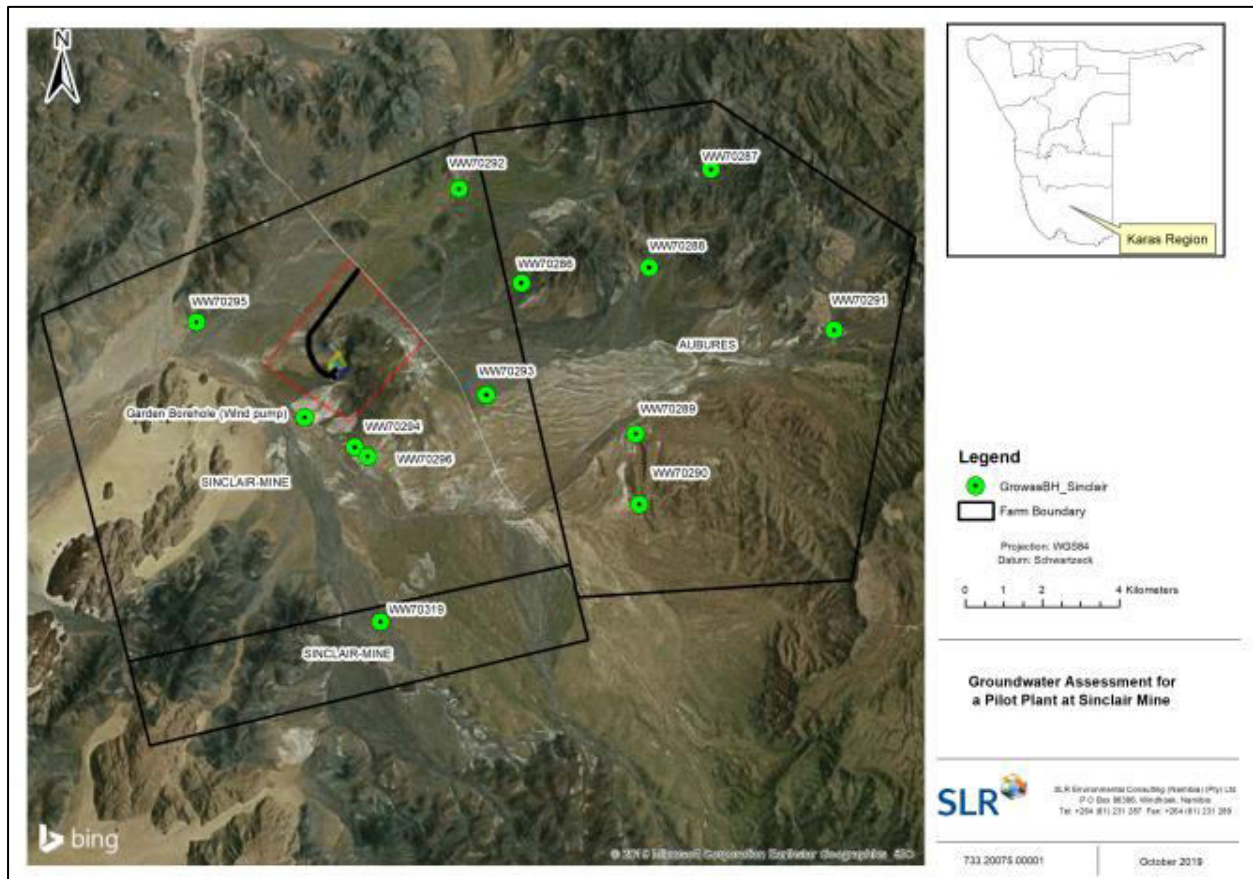


FIGURE 5: SITE INFRASTRUCTURE AND BOREHOLE LOCATIONS IN THE AREA

8.1.2 AIR MONITORING

An air quality monitoring programme can confirm both baseline and project related air pollution levels and provide information useful in assessing the effectiveness of emissions management strategies. The IFC recommends a systematic planning process to ensure that the data collected is adequate for their intended purposes and to avoid collecting unnecessary data. In recommending an air quality monitoring programme, the following was considered:

- Monitoring parameters

- Baseline calculations
- Monitoring type and frequency
- Monitoring locations
- Sampling and analysis methods

After careful consideration of the findings of the air quality assessment, remoteness of the project area, and logistical efforts involved in the continuous monitoring of air pollution levels the following is recommended:

- The sampling of particulate matter concentrations, specifically PM₁₀, at the Sinclair farmhouse using what is generally referred to as “low-cost” air quality sensors;
- Visual monitoring and reporting of dust emissions.

Low-cost air quality sensors have become an increasingly attractive means for environmental groups and individuals to independently evaluate air quality. Such sensors generally use laser particle counters that count suspended particles of 0.3 to 10 µm in size. Particle counts are processed by the sensor to calculate mass concentrations in µg/m³ and are factory calibrated in most cases. Real-time continuous data can be accessed via Wi-Fi or, in areas with limited or no access to Wi-Fi, stored internally for periodic manual download. The sensors require electricity for operation. It is recommended that Tulela consult a specialist in the selection and setup of sensors, training, and data analysis.

A visual inspection of dust emission sources such as crushers and haul roads must be done on a regular basis viz. at least once a month, and findings noted. Photographic records can be useful.

Monitoring should start as soon as possible, prior to the commencement of project activities to establish a baseline. Results must be communicated to interested and affected parties. Should results indicate exceedance of air quality criteria, an engineering approach to emissions may be required given limitations in using water for dust suppression.

8.1.3 NOISE MONITORING

Environmental noise monitoring at Sinclair farmhouse and along the project ML area at a minimum of four sites is essential. It should be conducted once before any on-site activities commence to determine the baseline acoustic climate, once during construction phase, annually

during the operational phase, and again once during the decommissioning, and once during the closure phase.

Noise surveys should be conducted by a trained specialist using a Type 1 sound level meter that meets all appropriate International Electrotechnical Commission's requirements. The monitoring period should be sufficient for statistical analysis and may last from 30 minutes up to 24 hours using noise monitors capable of logging data continuously over this time period. The type of acoustic indices recorded depends on the type of noise being monitored, as established by a noise expert but should include LAeq, LAeq, statistical noise levels and octave band frequency spectra. Monitors should be located approximately 1.5 m above the ground and no closer than 3 m to any reflecting surface.

Should monitoring indicate exceedance of assessment criteria, the survey specialist should investigate possible causes and determine the likely source. An engineering approach to noise reduction may be required in such a case. Monitoring results must be communicated to interested and affected parties.

8.1.4 SOIL MANAGEMENT MONITORING

Regular inspections of topsoil stockpiles and rehabilitated areas will be undertaken to ensure that the soil conservation procedure is being implemented.

8.1.5 NON-MINERALISED SOLID AND LIQUID WASTE

Weekly inspections of non-mineralised waste handling and management facilities will be undertaken to ensure that the waste management procedures are being implemented. The volume and type of non-mineralised waste, and the disposal destination, will be monitored and recorded as required. The results will be reported annually.

8.2 AUDITING COMPLIANCE OF THE EMP

The commitments contained in this EMP will, once an environmental clearance and the Mining Licence have been obtained, be Tulela's contractual agreement with the Namibian authorities for sound environmental management. All employees, contractors and sub-contractors and any visitors to site will be expected to comply with the commitments contained herein.

8.2.1 AUDITS AND INSPECTIONS

The Environmental Officer will conduct internal management audits against the commitments in the EMP. These audits will be conducted every month. The audit findings will be documented for both record keeping purposes and for informing continual improvement.

In addition, an independent professional will conduct an EMP performance assessment at least once a year for the Bi-Annual Report. The mine's compliance with the provisions of the EMP and the adequacy of the EMP relative to the on-site activities will be assessed in this report.

The Environmental Officer will furthermore conduct daily inspections during construction and weekly inspections during mining operations.

8.2.2 SUBMISSION OF INFORMATION

As a minimum, the following documents will be submitted to the relevant authorities on an ongoing basis:

- The bi-annual report required by the MET will be submitted every six months.

APPENDIX A: MINE CLOSURE FRAMEWORK

1. Introduction

The aim of this Mine Closure Framework (MCF) is to present Cathral Investment's (Tulela's) commitment and approach towards closure of all aspects relating to the mine's operations. Ultimately it provides the basis for developing the Mine Closure Plan in conjunction with:

- Applicable legislation and relevant guidelines;
- All stakeholders; and
- Best Practice.

This document will therefore be a living document to be reviewed and updated when applicable and will form the basis of the Mine Closure Plan.

The (Conceptual) Mine Closure Plan needs to be submitted as part of the Mining Licence Application to MME.

2. Approach

The *Namibian Mine Closure Framework* specifies the following content for this MCF:

- "Key objectives (for instance housing, community integration, future use of disturbed areas);
- Main closure aspects and associated components;
- Closure risk analysis;
- Stakeholder expectations;
- Evaluation of alternatives; and
- Identification of preferred alternatives.

Cathral Investment / Tulela intends to follow the above mentioned guidance in developing its Mine Closure Plan which will be a dynamic process that is integrated with life-of-mine planning to ensure a seamless transition from the operational to the decommissioning phases in the project life cycle.

Successful mine completion is achieved with final lease relinquishment, the key to which is early establishment and agreement amongst all parties concerned, on attainable closure criteria. The Mine Closure Plan which is central to this process evolves in complexity throughout the life of the

mine. There will always be a level of residual risk or uncertainty throughout the process and this requires on-going assessment and management. All closure planning will therefore be risk-based and consider environmental, social, economic and regulatory risks.

3. Legislation

Guidance relating to mine closure is provided in the *Namibian Mine Closure Framework* developed by the Namibian Chamber of Mines in November 2008. This document outlines the Namibian regulatory setting in some detail, with reference to the following pieces of legislation:

- Minerals Policy of Namibia, 2002;
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation, 1994;
- Policy for Prospecting and Mining in Protected Areas and National Monuments, 1999;
- General Environmental Assessment Guidelines for Mining (Onshore and Off-shore) Sector of Namibia, 2000;
- Policy for the Conservation of Biotic Diversity and Habitat Protection, 1994;
- The Minerals (Prospecting & Mining) Act, No 33 of 1992;
- The Environmental Management Act, 7 of 2007;
- Water Act, 54 of 1956;
- The Atmospheric Pollution Prevention Ordinance, 11 of 1976; and
- Labour Act No. 6 of 1992.

Cathral Investment will take into account the requirements of the above mentioned legislation and will implement the relevant requirements when developing the Mine Closure Plan.

4. Mine closure objectives

The Sinclair Mine closure planning process will be guided by the following objectives that are endorsed by the Namibian Chamber of Mines (2008):

- To enable stakeholders to have their interests considered during the mine closure process;
- To ensure the process of closure occurs in an orderly, cost-effective and timely manner;
- To ensure the cost of closure is adequately represented in company accounts and that the community is not left with a liability;
- To ensure there is clear accountability and adequate resources for implementation of the closure plan;
- To establish a set of indicators which demonstrate the successful completion of the closure process; and
- To reach a point where the company has met agreed completion criteria to the satisfaction of the responsible Government regulator.

Ultimately it will be necessary for Cathral Investment to demonstrate that closure of the Sinclair Mine is socially, technically, and economically feasible without incurring long term liabilities for the government of Namibia. In addition to the above, Cathral Investment also acknowledges the mine closure objectives as specified in the *Namibian Mine Closure Framework*:

- Prepare for changes in employment conditions at closure (negative social effects on people dependent on mine);
- Understand closure risks and prepare to mitigate impacts on associated communities and dependent businesses;
- Protect public health and safety and the environment by using safe and responsible closure practices;
- Reduce or eliminate adverse environmental effects once the mine ceases operations;
- Establish conditions which are consistent with the predetermined end use objectives; and
- Reduce the need for long-term monitoring and maintenance by establishing effective physical, chemical and ecological stability of disturbed areas.

5. Key environmental values

The following key environmental values need to be addressed:

- Disturbed areas other than those comprising the open pit, box cuts, VAT/Heap leach facility and waste rock dump (WRD) will be returned to as close to the baseline condition as practicable, taking the natural habitat into consideration;
- Permanent visible features such as the WRD and related environmental bunds as well as safety bunds around the open pit will be left in a form that blends with the surrounds, as far as possible;
- The VAT/Heap leach facility will be covered with waste rock on top of the plastic liner and topsoil on top of the waste rock.
- The processing plant and all associated infrastructure will all be dismantled, and salvageable elements will be de-contaminated and sold or re-used by Tulela. Non-salvageable elements will be dismantled or broken up, transported to and disposed of as per the Waste MP;
- The new access roads will be rehabilitated, depending agreement with the Sinclair Farm owner.
- Contaminated soils underlying the structures will be excavated for disposal at a hazardous waste disposal facility or for bio remediation at a designated area on the ML after which the soils will be carted to the open pit; Residual excavations will be backfilled and levelled using selected overburden material from open pit mining operations; and
- Socio-economic impacts (including the loss of employment) will be minimised through careful planning and preparation for closure beginning three to five years before closure takes place.

The above principles and concepts will be refined as part of ongoing detailed closure planning and costing during the life of mine.

6. Closure needs

Cathral Investment / Tulela has developed a number of closure needs, based the key environmental and community values as described in Section 4. These include the following:

- Remove all infrastructure (other than the WRD and VAT/Heap leach facility);
- Re-establish a landscape that can over time regenerate sustainable endemic vegetation communities;
- Ensure that an ecologically functioning (Fauna & flora) environment is left behind;
- Effectively decontaminate and remediate all areas affected by the mine; and
- Socio-economic factors (employees, suppliers, community).

In addition to the above, the Sinclair Farm owner's needs will also be taken into consideration.

7. Closure planning, costing and funding

At this stage it is assumed that the mine area will revert back to its original land use. As such the mine closure goal is to return the site to, as close as possible, its original state.

As such the closure strategy is to remove all buildings and structures from the project area and rehabilitate the sites, disposing of all chemicals and contaminated material in an environmentally-safe manner. All physical landforms/features resulting from mining operations are to be engineered in such a manner that their long-term landforms are stable, safe and re-vegetated. The water quality of any seepage or run-off will be such that it meets baseline water standards.

Tulela will make funds (Financial Assurance) available for closure of the mine, from the outset of the implementation of the project. The closure costing requirements will be refined throughout the development of the closure plan.

The Conceptual Financial Assurance amount will be included as part of the Conceptual Mine Closure Plan, to be submitted to MME as part of the ML Application (see section 1).

8. Closure Plan

Cathral Investment acknowledges the requirements for the Closure Plan content specified in the *Namibian Mine Closure Framework* and the Mine Closure Plan will therefore include:

- Social Plan (employees and communities);

- Rehabilitation requirements;
- Decommissioning requirements;
- Monitoring requirements; and
- Closure costing.