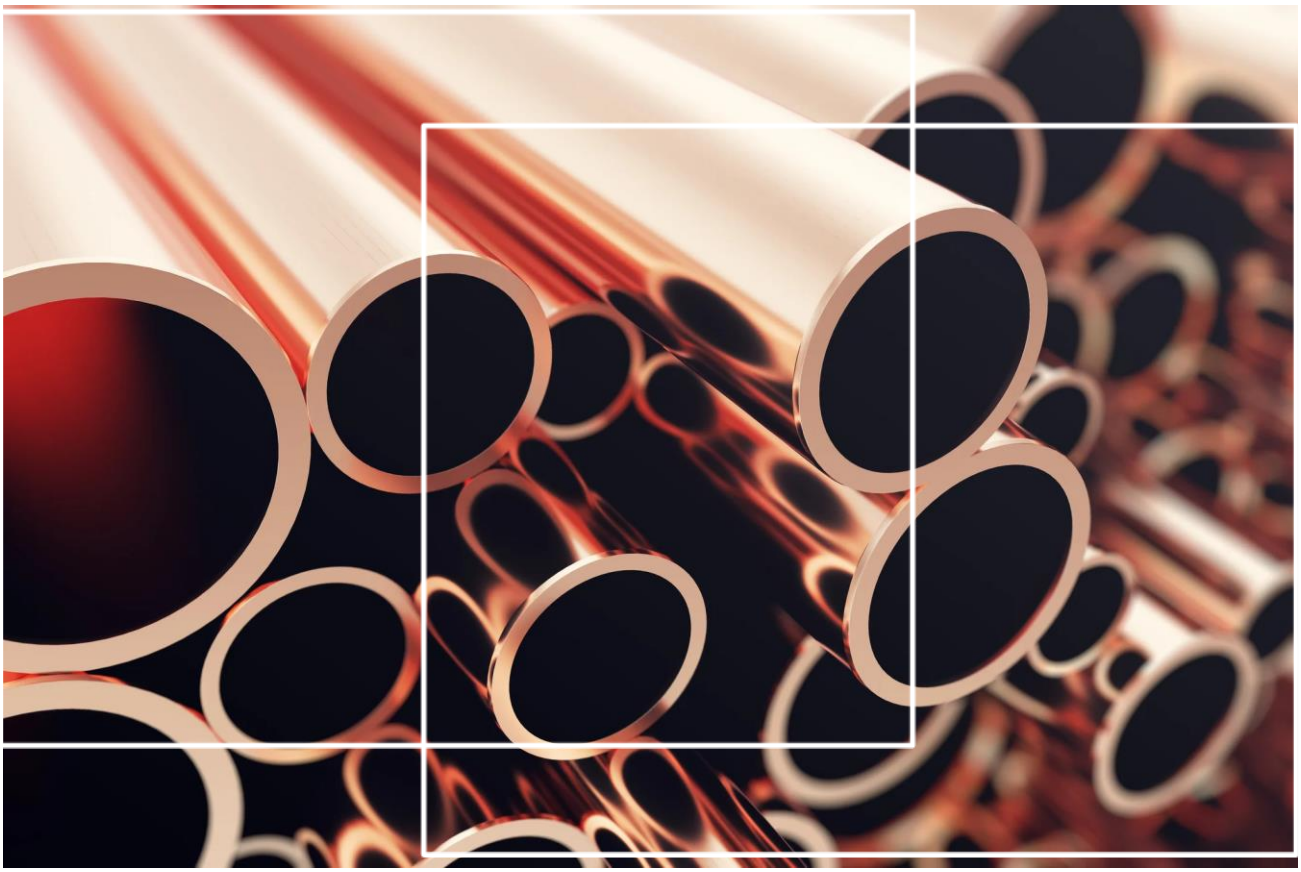

CRATON
Mining and Exploration (Pty) Ltd
Company Registration No. 2006/713

Submitted to: Craton Mining and Exploration (Pty) Ltd
Attention: Mr Mike Stuart
P O Box 90128
Windhoek.

REPORT:

OMITIOMIRE COPPER PROJECT ON ML 197 – ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

PROJECT NUMBER: ECC-134-394-REP-32-D

REPORT VERSION: REV 01

DATE: 08 APRIL 2024

Prepared by: ECC ENVIRONMENTAL COMPLIANCE CONSULTANCY

TITLE AND APPROVAL PAGE

Project Name:	Omitiomire Copper Project on ML 197 – Environmental and social management plan
Client Company Name:	Craton Mining and Exploration (Pty) Ltd
Client Name:	Mr Mike Stuart
Ministry Reference:	APP-0010357/001107
Status of Report:	Final for Government submission
Project Number:	ECC-134-394-REP-32-D
Date of issue:	08 April 2024
Review Period	NA

ENVIRONMENTAL COMPLIANCE CONSULTANCY CONTACT DETAILS:

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DISCLAIMER

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

Please note at ECC we care about lessening our footprint on the environment; therefore, we encourage that all documents are printed double sided.

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ABBREVIATIONS

Abbreviations	Description
%	percentage
ASTM	American Society for Testing and Materials
Craton	Craton Mining and Exploration (Pty) Ltd
DWA	Department of Water Affairs
ECC	Environmental Compliance Consultancy (Pty) Ltd
EM	environmental manager
EMA	Environmental Management Act No, 7 of 2007
ESMP	environmental and social management plan
EMS	environmental management system
ESIA	environmental and social impact assessment
GIS	geographic information system
GPS	global positioning system
HSE	health, safety and environment
LoM	life of mine
Ltd	limited
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
ML	mining licence
MSDS	material safety data sheet
NHC	National Heritage Council [of Namibia]
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PM_{10}	particulate matter with a diameter of 10 microns or less
PM	particulate matter
PPE	personal protective equipment
Pty	Proprietary
SOP	standard operating procedure
ToR	terms of reference
WRD	waste rock dump

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Environmental Compliance Consultancy (Pty) Ltd (ECC) has been retained by Craton Mining and Exploration (Pty) Ltd as the environmental assessment practitioner (EAP) for the proposed construction and operation of an open pit copper mine to produce cathode copper on ML 197, Khomas Region. ML 197 is located ~140 km northeast of Windhoek (by road) and ~39 km south of Hochfeld, in the Khomas Region of Namibia (Figure 1).

ECC has compiled this environmental and social management plan (ESMP) in terms of the Environmental Management Act (EMA), No. 7 of 2007 and its associated Regulations of 2012. The purpose of this ESMP is to support the full environmental and social impact assessment (ESIA) report.

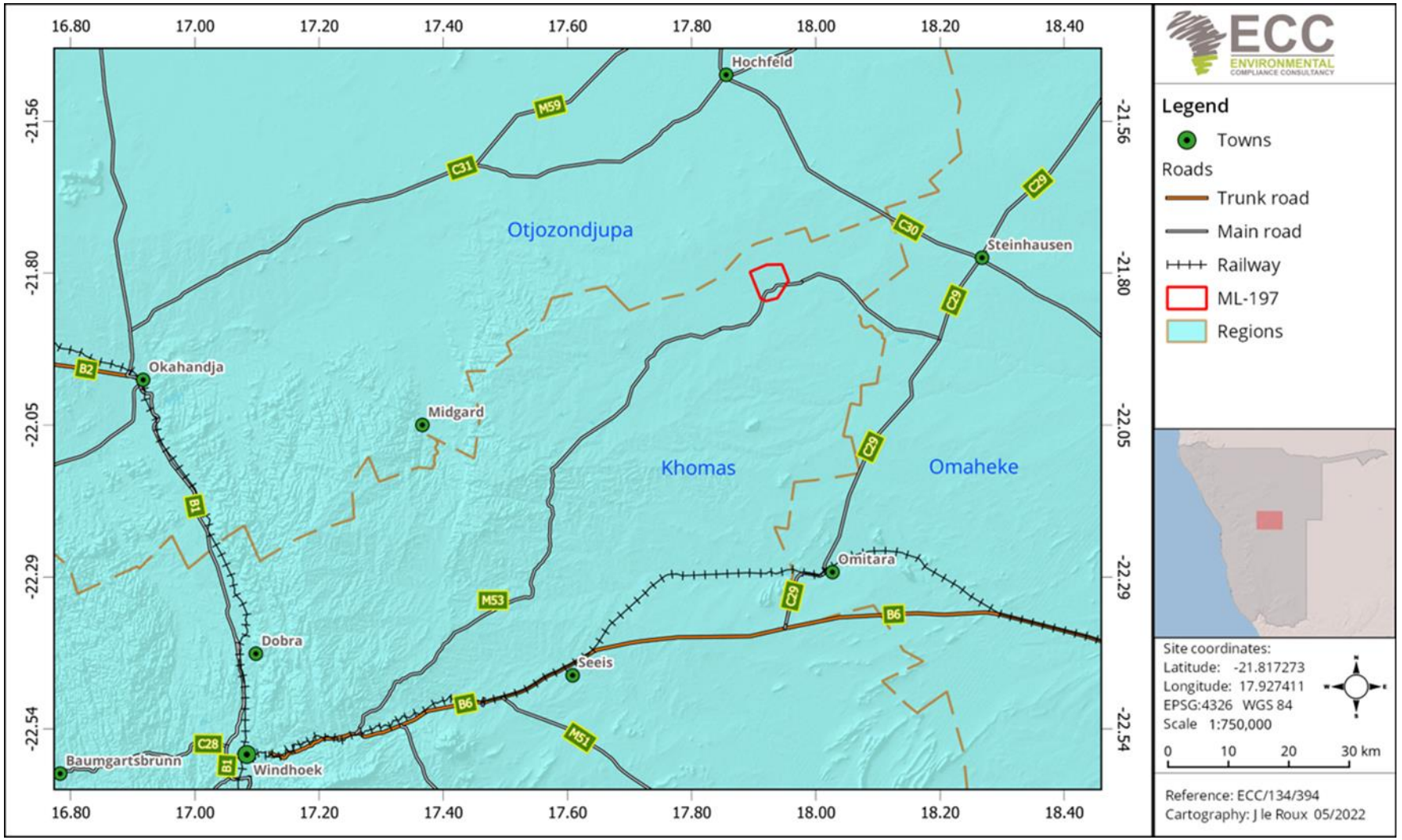

Figure 1 - Locality map showing the location of the proposed Omitiomire Copper Project.

1.2 ENVIRONMENTAL REGULATORY REQUIREMENTS

The proposed project is considered as a listed activity as stipulated in the Environmental Management Act, No. 7 of 2007 and its Regulations, promulgated in 2012. An environmental scoping report, environmental impact assessment (EIA) and environmental management plan (ESMP) are required to be submitted as part of the application to support the decision-making process for issuing an environmental clearance certificate.

This report presents the ESMP and has been undertaken in terms of the requirements of the Environmental Management Act, 2007 and its Regulations.

1.3 PURPOSE AND SCOPE OF THIS REPORT

The environmental and social management plan (hereafter referred to as the ESMP) provides a logical framework, mitigation measures and management strategies for the mining activities associated with the proposed Project, in this way ensuring that the potential environmental and social impacts are curbed and minimised as far as practically possible and that statutory and other legal obligations are adhered to and fulfilled. Outlined in the ESMP are the protocols, procedures and roles and responsibilities to ensure the management arrangements are effectively and appropriately implemented.

The ESMP forms an appendix to the environmental scoping report and is based on the findings of the assessments carried out to date. The environmental scoping report should be referred to, for further information on the proposed Project, assessment methodology and terms of reference (ToR), applicable legislation, and assessment findings.

This ESMP is a live document and shall be reviewed at predetermined intervals, and or updated during the ESIA process when or if the scope of work alters, or when further data or information is added. All personnel working on the Project will be legally required to comply with the requirements set out in the final ESMP that is approved by the competent authorities and Ministry of Environment, Forestry and Tourism (MEFT).

The scope of this ESMP includes all activities associated with the Omitiomire Copper Project.

1.4 MANAGEMENT OF THIS ESMP

The Proponent will hold the environmental clearance certificate for the proposed Project and will be responsible for the implementation and management of this ESMP. Before the mining activities commence, this ESMP will be reviewed, amended as required and approved ready for implementation. The implementation and management of this ESMP, and thus the monitoring of compliance, will be undertaken through daily duties and activities, as well as monthly inspections. The respective compliance summary reports will be prepared and submitted biannually and will form the basis of any clearance certificate renewals.

1.5 LIMITATIONS, UNCERTAINTIES, AND ASSUMPTIONS RELATED TO THIS ESMP

This ESMP does not include measures for compliance with statutory occupational health and safety requirements. This will be provided in the safety management plan to be developed by the Proponent.

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

The information contained in this ESMP has been based on the project description as provided in the ESIA report. Where the design or construction methods are different, this ESMP may require updating and potential further assessment may be undertaken.

1.6 ENVIRONMENTAL ASSESSMENT PRACTITIONER

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

All compliance and regulatory requirements regarding this report should be forwarded by email or posted to the following address:

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PO Box 91193, Klein Windhoek, Namibia
Tel: +264 81 669 7608
Email: info@eccenvironmental.com

2 ENVIRONMENTAL MANAGEMENT FRAMEWORK

This ESMP provides measures, guidelines, and procedures for managing and mitigating potential environmental impacts. The ESMP also indicates monitoring and reporting guidelines and sets responsibilities for those carrying out management and mitigation measures.

2.1 OBJECTIVES AND TARGETS

Environmental objectives and targets have been developed so that mining activities can minimise potential impacts on the environment, as far as reasonably practicable.

Environmental objectives for the project are as follows:

- Zero pollution incidents;
- Minimal vegetation clearing and earthworks;
- Minimal impact on regional groundwater users;
- Protect local flora and fauna, and
- Use natural resources effectively and efficiently.

2.2 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

The Proponent shall provide a project team to oversee and undertake the preparation and mining activities, which will be composed of the Proponent's personnel and contractors. A nominated role shall be identified to ensure the management and implementation of this ESMP is carried out throughout the Project Life of Mine (LoM). The Proponent shall be responsible for:

- Ensuring all members of the project team, including contractors, comply with the procedures set out in this ESMP;
- Ensuring that all persons are provided with sufficient training, supervision, and instruction to fulfil this requirement;
- Ensuring that any persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood; and
- Contractors shall be responsible for ensuring and demonstrating that all personnel employed by them are compliant with this ESMP, and meet the responsibilities listed above.

Table 1 lists the roles and responsibilities allocated to different management levels in the company and specific personnel.

Table 1 – Roles and responsibilities

Role	Responsibilities and duties
Proponent	– Responsible for the overall management and implementation of the ESMP; – Ensure environmental policies are drafted/updated and communicated to all personnel throughout the company;

Role	Responsibilities and duties
	– Responsible for providing the resources required to effectively run the mine and comply with the ESMP; – Appoint all managers needed to ensure effective running of the mine; and – Ensure systems for proper induction and training of personnel and contractors are in place.
Mining management	– Manage all activities on the mine; – Monitor daily operations and ensure systems are in place for implementation of the ESMP; – Maintain the community issues and concerns register and keep records of complaints; – Ensure corrective action(s) are taken and communicated to complainants; and – Maintain up to date records of employees who have completed training and induction.
Site manager	– Ensure that all contract workers, sub-contractors and visitors to the site are aware of the requirements of this ESMP, relevant to their roles and always adhere to this ESMP; – Report any non-compliance or accidents; – Receive, recording and responding to complaints; – Ensure adequate resources are available for the implementation of the ESMP; – Ensure safe and environmentally sound operations; and – Responsible for the management, maintenance, and revisions of this ESMP.
HSE Appointed Person	– Maintain the mine's EMS; – Draught and update mine specific environmental procedures; – Ensure on-mine induction training is relevant and address issues from this ESMP; – Do all environmental audits and inspections and report findings to relevant personnel; – Check the implementation of corrective action for incidents and complaints; – Ensure all environmental monitoring and reporting is done; – Conduct environmental monitoring, audits and inspections; and – Compile draft environmental reports.
Employees	– Adhere to measures set out in the ESMP; – Ensure they have undertaken a site induction; and

Role	Responsibilities and duties
	– Report any operations or conditions which deviate from the ESMP as well as any non-compliant issues or accidents to the Environmental Manager

2.3 CONTRACTORS

Any contractors hired during the mining the construction or operational phase of the Project shall be compliant with this ESMP and shall be responsible for the following:

- Undertaking activities in accordance with this ESMP as well as relevant policies, procedures, management plans, statutory requirements, and contract requirements;
- Implementing appropriate environmental and safety management measures;
- Reporting of environmental issues, including actual or potential environmental incidents and hazards, to the site manager; and
- Ensuring appropriate corrective or remedial action is taken to address all environmental hazards and incidents reported by employees and subcontractors.

2.4 EMPLOYMENT

The Proponent and all contractors shall comply with the requirements of the Republic of Namibia Regulations for Labour, Health and Safety, and any amendments to these regulations. The following shall be complied with:

- In liaison with local government and community authorities, the Proponent shall ensure that local people have access to information about job opportunities and are considered first for construction/maintenance contract employment positions;
- The number of job opportunities shall be made known together with the associated skills and qualifications required;
- The maximum length of time the job is likely to last for shall be indicated;
- Foreign workers with no proof of permanent legal residence shall not be hired;
- Every effort shall be made to recruit from the group of unemployed workers living in the surrounding area.

2.5 REGISTER OF ENVIRONMENTAL RISKS AND ISSUES

An environmental review of the proposed Project has been completed to identify all the commitments and agreements made. A list of environmental commitments and risks has been produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment during the mining phase.

This ESMP consist of environmental risks and issues, as derived from the ESIA and provided mitigation measures. It will be subject to regular review by the General Manager and updated when

necessary. The Mining Manager and Environmental Manager will use this register to undertake monthly inspections (see next section) to ensure the project is compliant with this ESMP.

3 ENVIRONMENTAL MANAGEMENT PRINCIPLES

3.1 CONTINUAL IMPROVEMENT

The Proponent's team is responsible for reviewing and updating this ESMP, which will be supported by the monthly reports from the different domains of the mine. As part of this review process, the monthly reports will be reviewed, identifying any trends or significant areas of concern, as well as measures implemented to manage / resolve environmental or social issues. Compliance and legislative changes will be reviewed, and lessons learnt will be captured. The ESMP will be amended as required, and follow up training, awareness or updates will be provided.

Ongoing hazard identification through the review of the ESMP and supporting management plans and SOPs will ensure environmental impacts are avoided or minimised to as low as reasonably practicable as part of the continuous improvement of the EMS.

3.2 BEST PRACTICE

The best practice management measures that will be complied with across site are listed in Table 2

Table 2 – A list of environmental best practice measures to be implemented.

Environmental aspect	Best practice requirement
Pollution prevention control	- Plant and equipment to be maintained and serviced regularly; - Refuelling at designated locations; - Spill kits available where the risk of loss of containment is identified; - Bunds to be at least 110 % of the container; and - Good housekeeping.
Solid waste management	- Good housekeeping (no littering); - Designated waste collection areas around site and one central location; - Bins labelled; - Waste to be separated and kept clean and tidy; and - Waste bins emptied on regular basis.
Ground contamination	- Refuelling will be undertaken in designated areas with spill kits available; - Chemical management to be enforced on site; and - Good housekeeping.
Storage of fuels, oils, chemicals and other hazardous liquids	- Storage tanks will be suitable and labelled for the liquid being stored; - Bunds to be at least 110 % of the container; and

Environmental aspect	Best practice requirement
	- Daily inspections of tanks.
Energy efficiency	- Plant and equipment to be maintained and serviced regularly; and - Turn off plant and equipment when not in use.
Air quality	- Maintenance of roads; - Turn off plant and equipment when not in use; and - Plant and equipment to be maintained and serviced regularly.

3.3 ENVIRONMENTAL MONITORING

A monitoring and evaluation program will be used in line with internal HSE standards to evaluate environmental performance and promote continual improvement. Monitoring also supports environmental management on site to evaluate how effective the environmental management has been, over an extended period of time.

An environmental monitoring schedule will be put in place for the operations.

The monitoring program comprises:

- Air quality monitoring;
- Noise and vibration monitoring;
- Water monitoring (e.g. surface water, groundwater and discharge water) correlated to an acid rock and mine drainage investigations and monitoring;
- Biodiversity monitoring (e.g. fauna, vegetation);
- Meteorological monitoring (e.g. rainfall and evaporation); and
- Stakeholder and community engagement.

The Environmental Officer with the support of the environmental field technician/s, will be tasked with conducting the monitoring within the Domain with the support of the Mining Manager.

4 COMMUNICATION AND TRAINING

To ensure potential risks and impacts are minimised it is vital that personnel are appropriately informed and trained on how to properly implement the ESMP. It is also important that regular communications are maintained with stakeholders (if applicable) and made aware of potential impacts and how to minimise or avoid them. This section sets out the framework for communication and training in relation to the ESMP.

4.1 COMMUNICATIONS

During construction and operations, the project manager and site manager shall communicate site-wide environmental issues to the project team through the following means (as and when required):

- Ensure all personal are afforded the opportunity to attend an environmental site induction that sets out their requirements in relation to this ESMP.
- Ensuring audits and inspections are undertaken regularly on a risk-based schedule.
- Toolbox talks, including instruction on incident response procedures.
- Deliver project-specific environmental briefings where required.
- Ensure all personnel have access to the ESMP.
- Ensure operators of key activities and environmentally sensitive operations are briefed and understand their requirements.
- Ensure emergency procedures are tested to ensure the programs, procedures, risk assessments, and training is adequate.

This ESMP shall be distributed to the mining team including any contractors and personnel working on the mining site to ensure that the environmental requirements are adequately communicated. Key activities and environmentally sensitive operations shall be briefed to workers and contractors.

During the mining activities, communications between the management team shall include discussing any complaints received and actions to resolve them; any inspections, audits, or non-conformance with this ESMP; and any objectives or target achievements.

4.2 ENVIRONMENTAL EMERGENCY AND RESPONSE

An emergency is any abnormal event, which demands immediate attention. It is any unplanned event, which results in the temporary loss of management control at site, but where functional resources can manage the response. An Emergency Response plan document will be put in place that manages the response in relation to emergencies including environmental emergencies. Emergency contact details are presented in Table 3.

Table 3 – Emergency contact details

Town	Ambulance	Police	Fire brigade
Windhoek	+264 (81) 872 2233	+264 (61) 10 111	+264 (61) 290 3381

For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the office of the Ministry of Environment, Forestry and Tourism (MEFT) informed of the incident (telephone +264 61 284 2111). All correspondence with MEFT should be undertaken by the General Manager.

For the clean-up of smaller spills, the relevant Material Safety Data Sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic spill response training will be provided as part of the site environmental induction, spill response equipment, including relevant MSDS copies, will be provided in areas where potentially environmentally hazardous chemicals may be used.

4.3 COMPLAINTS HANDLING AND RECORDING

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

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

The information shall be given to the Project Manager who is overall responsible for the management of complaints. The Project Manager shall do the following:

- Inform the Site Manager of issues, concerns, or complaints;
- The Project Manager must maintain a complaint register that captures details of the complaint; and
- The Project Manager will provide a written response to the complainant of the results of the investigation and action(s) to be taken to rectify or address the matter(s). Where no action is taken, the reasons why are to be recorded in the register.

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

4.4 TRAINING AND AWARENESS

All personnel working on the project shall be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training, and experience. Training and toolbox talks will be provided to all employees and contractors.

4.5 SITE INDUCTION

All personnel involved in the Project shall be inducted to the site with a specific environmental awareness training, and health and safety issues. The environmental awareness training shall ensure that personnel are familiar with the principles of this ESMP, and the environmental impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures. The Project Manager shall ensure a register of completed training is maintained.

The site induction should include, but is not limited to the following:

- A general site-specific induction that outlines:
    - What is meant by “environment” and the ESMP?
    - Why the environment needs to be protected and conserved?
    - How can mining activities impact the environment?
    - What can be done to mitigate against impacts?
- The inductee's role and responsibilities concerning implementing the ESMP.
- The site’s environmental rules
- Details of how to deal with, and who to contact should any environmental problems occur.
- Basic vegetation clearing principles and species identification sheets.
- Informed of the Chance Find Procedure.
- The potential consequences of non-compliance with this ESMP and relevant statutory requirements, and
- The role of responsible people for the Project.

5 INCIDENT REPORTING

The Proponent must have an accident and incident reporting system that covers all applicable statutory requirements. The section below sets out the minimum requirements for incident reporting and should be used as a basis for incident reporting, if no incident reporting system exists.

5.1 MINOR INCIDENT OR "NEAR MISS"

Any incident or "near miss" involving the Proponent's employees, a nominated representative, any contractor, or its subcontractors or any third party's personnel, property, plant, or equipment, must be:

1) Orally reported to the manager or the manager's nominated representative:
    a. immediately and without delay
    b. regardless of whether injury to personnel has occurred
    c. or property or equipment has been damaged.
2) Written up and handed to the manager or the manager's nominated representative by the end of the shift. The written report should:
    a. state all known facts and conditions at the time of the incident and
    b. includes a preliminary assessment of the most likely potential consequences of the incident under the current circumstances.

5.2 SERIOUS INCIDENT

For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched until witnessed by a representative of the police. This requirement does not preclude immediate first aid being administered and the location being made safe.

5.3 INCIDENT REPORT AND CLOSE OUT

The manager must investigate the cause of all work accidents and significant incidents and must provide the results of the investigation and recommendations on how to prevent a recurrence of such incidents. A formal root-cause investigation process should be followed.

6 COMPLIANCE AND ENFORCEMENT

6.1 ENVIRONMENTAL INSPECTIONS AND COMPLIANCE MONITORING

Inspections and audits of the site will be managed and undertaken by the Mining Manager to check that the standards and procedures set out in this ESMP are being complied with and pollution control measures are in place and working correctly. All equipment will be inspected to ensure they are operating as per specification; no damage has been caused, and no leaks or spills have occurred. Any non-conformance shall be recorded, including the following details: a brief description of non-conformance; the reason for the non-conformance; the responsible party; the result (consequence); and whether the corrective action is taken and any necessary follow up measures required. The application documentation for renewal of the environmental clearance certificate must include an audit report and copies of the 6 bi-annual reports that were submitted every 6 months for the 3 years that the clearance certificate is valid for.

6.2 HERITAGE PERMIT

As part of the application for an environmental clearance, an application for a permit must first be submitted to the National Heritage Council (NHC). Once issued the permit must be cited and included in the ESIA report and ESMP. The contents of the application for the heritage permit can be obtained from the council. The requirements to renew the heritage permit can also be obtained from the council's head offices in Windhoek.

6.3 WATER PERMITS AND LICENCE

The Water Act of (1956) governs the use of water resources in Namibia and is the enforceable piece of legislation for water related matters. The Water Resources Management Act of (2013), passed but pending regulations (not enforced), provides an improved framework for managing water resources based on the principles of integrated water resource management. While not enforced, it is considered best practice to adhere to its stipulations while ensuring compliance with the Water Act of 1956 at the same time.

6.4 WASTEWATER DISCHARGE PERMIT

If the operations produce wastewater, a permit must be obtained from the Department of Water Affairs (DWA). To obtain an effluent wastewater permit, the Proponent should provide the following information and complete the application form issued by the DWA:

- Specification of the treatment system (type of technology)
- Description of major activities resulting in effluent generation
- List of contaminants (analysis of effluent samples)
- Effluent quality

- Points of discharge
- Show the present average quantities of incoming water, recycled water, final outflow
- Where final effluent will be discharged

6.5 REPORTING

Reports shall be submitted to the Mining Commissioner in terms of the Minerals (Mining and Prospecting) Act, No. 33 of 1992.

Bi-annual environmental reports shall be submitted to the Environmental Commissioner every 6 months of every year. These reports should include records of the monitoring and other deliverables of every aspect or programme described in the ESMP.

6.6 NON- COMPLIANCE

Where it has been identified that works are not compliant with this ESMP, the Project Manager shall employ corrective actions so that the works return to being compliant as soon as possible. In instances where the requirements of the ESMP are not upheld, a non-conformance and corrective action notice shall be produced. The notice shall be generated during the inspections and the Project Manager shall be responsible for ensuring a corrective action plan is established and implemented to address the identified shortcomings.

A non-compliance event / situation is considered if, for example:

- There is evidence of a contravention of this ESMP and associated indicators or objectives.
- The Site Manager and or contractor have failed to comply with corrective or other instructions issued by the Environmental Manager or qualified authority.
- The Site Manager and or contractor fail to respond to complaints from the public.

Activities shall be stopped in the event of a non-compliance until corrective action(s) has been completed.

6.7 DISCIPLINARY ACTION

This ESMP is a legally binding document and non-compliance with it shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to):

- Fines / penalties
- Legal action
- Monetary penalties imposed by the Proponent on the contractor
- Withdrawal of licence
- Suspension of work

The disciplinary action shall be determined according to the nature and extent of the transgression / non-compliance, and penalties are to be weighed against the severity of the incident.

7 BIODIVERSITY MANAGEMENT PROGRAMME

7.1 INTRODUCTION

Construction of the mine and operations on site will include the removal off floral and displacement of fauna. It is therefore vital to ensure that all management, monitoring and mitigation actions are adhered to in order to manage and minimise environmental impacts and any potential pollution that could further impact the receiving environment.

7.2 OBJECTIVES

The ESMP objectives are to minimize negative direct effects of the mining construction and operations on the receiving environment. These objectives are:

- Mitigation and monitoring;
- Avoid compromising future exploration of resources by managing impacts and mitigating or minimizing these impacts;
- Establish and maintain an information base that will assist in evaluating the cumulative impacts of the operations and establish recovery rates of biodiversity impacted during the mining operations;
- Minimize potential conflict with fauna;
- Ensure the conservation of biodiversity where possible; and
- Preserve ecosystem services, such as function related to water and soil drainage.

7.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

Required to take all reasonable measures to prevent the damage of flora and fauna and pollutants from the site into the receiving environment. Report any damage to fauna or flora to the environmental coordinator.

ENVIRONMENTAL COORDINATOR

Will ensure that the objectives listed above are being met and provide performance feedback to the manager.

7.4 BIODIVERSITY MANAGEMENT MEASURES

The biodiversity management plan measures are designed to minimise the damage to biodiversity on site. Mining activities that could potentially damage protected and endangered species include:

- Chemical spills and mine water contamination;
- Refueling; and
- Clearing land.

Table 4 below shows the environmental risks and issues, and mitigation and monitoring measures for biodiversity aspects.

Table 4 - Biodiversity management aspects

Responsibility	– Environmental Manager
Potential issues or impacts	– Possible injury or death of animals – Poaching – Habitat fragmentation from clearing activities – Flora disturbance – Potential spread of alien invasive species – Habitat loss from excessive clearing
Mitigation measures	
General	– Ensure internal land clearing permits are applied for prior to land clearing and through this process the environmental team can recover or rescue plants of significance or plants that can be used for progressive rehabilitation. Permits are to be obtained from Directorate of Forestry. – Limit the development to actual sites to be mined and avoid affecting adjacent areas, especially ephemeral drainage lines, throughout the entire area. – Avoid development and associated infrastructure in sensitive areas e.g. ephemeral pans in the immediate area. This would minimise the negative on these unique features that are serving as habitat to various vertebrate fauna species. – Minimise areas cleared by ensuring that an early works construction plan or a construction management plan is in place and conveyed to contractors. – All workers on-site are to be notified to avoid any excluded areas or species. – Identify rare, endemic, endangered, threatened, and protected species and demarcate them and avoid cutting them down, trampling them, or removing them, where possible. – Remove (e.g. capture) unique fauna and sensitive fauna, as well as slow moving species before commencing with the development activities, as well as during the operational phase, and or species serendipitously located during this period and relocate to a less sensitive/ disturbed sites in the immediate area. – Remove unique, sensitive flora and protected plant species before commencing with the development activities and relocating to less sensitive/disturbed sites in the immediate area if disturbance cannot be avoided.

	– Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) – Prevent and discourage fires – especially during the development phase(s) – as this could easily cause runaway veld fires affecting both the local fauna and flora (e.g., loss of grazing and domestic stock mortalities, etc.) for the neighbouring farmers. – Prevent domestic pets – e.g. cats and dogs – accompanying the workers during the construction phase as cats decimate the local fauna and interbreed and transmit diseases. Dogs often cause problems when bonding on hunting expeditions thus negatively affecting the local fauna. The indiscriminate and wanton killing of the local fauna by such pets should be avoided at all costs. – Prevent the planting of potentially invasive alien plant species for ornamental purposes as part of the landscaping – e.g., office buildings, plant site, access gate, etc. Alien species often "escape" and become invasive causing further ecological damage as is evident from previous human habitation in the area. – Eradicate – destroy – all invasive alien plants encountered on site. This would ensure that the spread is limited and show environmental commitment. This should be conducted by a qualified botanist to prevent further spread of invasive species. – Incorporate indigenous vegetation – especially the protected species – into the overall landscaping. Indigenous species require less water and overall maintenance. – Initiate a suitable waste removal system as this often attracts wildlife – e.g., baboons etc. – which may result in human-wildlife conflict issues. – Educate/inform contractors and staff on protected species to avoid and the consequences of illegal collection of such species. – No poaching. – No animals or birds may be collected, caught, consumed, or removed from the site by the contractor or personnel on site. – Monitor, manage and prevent mine site water contamination of soils, groundwater and any ephemeral waterways. – Progressive rehabilitation during the mining phase should be used as soon as possible and continue throughout the operating phase. – Rehabilitation of the disturbed areas – i.e., initial development access route "scars" and associated tracks as well as associated mining/prospecting infrastructures should be rehabilitated as soon as their use is complete, otherwise access needs to be restricted. Preferably workers should be transported in/out to the construction sites on a daily basis to avoid excess damage to the local environment (e.g., fires,

	poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment. – Natural drainage patterns should be restored where possible. – Investigate the idea of employing an Environmental Officer during the construction phase(s) to ensure compliance and minimise the overall impact on the flora and the environment.
Tracks	– Avoid placing access routes (roads and tracks) through sensitive areas – e.g. along drainage lines within ephemeral (intermittent) pans and streams. This would minimise the effect on localised potentially sensitive flora and habitats in the area. – Route new tracks around established clumps of vegetation, where possible. – Avoid driving randomly through the area (i.e. "track discipline"), but rather stick to permanently placed roads/tracks – especially during the construction phase. This would minimise the effect on localised potentially sensitive flora and habitats in the area. – Avoid having to create new tracks for ongoing maintenance and inspections. – Stick to speed limits that are established to result in fewer faunal road mortalities as well as less dust pollution. Speed humps could also be used to ensure the speed limit. – Implement erosion control. – i.e., avoid constructing tracks up steep gradients (where runoff can deeply incise the slope and erode the road); incorporate erosion furrows (runoff sites) and humps along tracks to channel water off the tracks to minimise erosion problems; cross drainage lines at right angles, etc. The area(s) towards and adjacent the drainage line(s) are easily eroded, and further development may exacerbate this problem. Avoid construction within 100 m of the main drainage line(s) (ephemeral streams) to minimise erosion problems as well as preserving the riparian associated flora and fauna.
Access route	– Revegetate access routes upon completion of installation of associated infrastructure where possible.
WRD	– Terrace the waste rock dumps and cover with soil to facilitate stabilisation and rehabilitation. – Maintain drainage pathways and repair erosion gulleys
Monitoring requirements	
– Daily visual inspection during construction of new access tracks/widening, land clearing areas. – Regular checking of rehabilitation areas to ensure that the vegetation is flourishing and not dying. – Regular inspection of treated areas to monitor species re-growth capacity.	

- Biodiversity monitoring should be undertaken annually. This program will include, but is not limited to, monitoring of the condition of habitats, ecosystems, topsoil stockpiles, species inventory and alien vegetation control.
- Vegetation clearing permits are valid and on file.
- Water and groundwater monitoring to prevent water and soil contamination and impacts to related ecosystem services

8 SURFACE AND GROUNDWATER MANAGEMENT PROGRAMME

8.1 INTRODUCTION

Chemical and waste spills must be contained, so as not to contaminate the soil or groundwater. Any contact with groundwater must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer. It is important to limit the potential for wastewater seepage to groundwater.

This surface and groundwater management plan outlines appropriate surface and groundwater water management measures, monitoring programs and reporting procedures to be implemented.

8.2 OBJECTIVES

This surface and groundwater management plan has been prepared to minimise potential impacts on surface and groundwater resulting from the mining activities. It is important to report any contact with or contamination of groundwater to the environmental coordinator or site manager as soon as possible.

8.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS
Required to take all reasonable measures to prevent the discharge of sediments and pollutants from the site into surface and groundwater sources. Report any contact with groundwater to the environmental coordinator.

ENVIRONMENTAL COORDINATOR
Will ensure that the objectives listed above are being met and provide performance feedback to the manager.

8.4 SURFACE AND GROUNDWATER MANAGEMENT MEASURES

The surface and groundwater management plan measures are designed to minimise the runoff of sediment-laden or polluted water/effluent into the surrounding environment. Mining activities that could potentially alter natural surface water and groundwater quality include:

- Chemical spills
- Refuelling
- Seepage of wastewater or metal/acid-contaminated mine waters into groundwater
- Dewatering and mining
- Poor resource stewardship practices.

The following requirements are to be met to ensure that groundwater is not contaminated:

- Fuel/oil and chemicals must be safely stored and removed.
- Any contact with surface or groundwater must be treated with exceptional care and reported immediately, so as to minimize the potential for contamination of an aquifer.

Further management and mitigation measures are outlined in Table 5 below.

Table 5 - Water quality mitigation measures

Responsibility	Mining Manager Site Manager Employees
Potential issues or impacts	- Groundwater contamination due to incidental hydrocarbon spills - Change in the water table - Heap leach pad failure - Water contamination due to acid mine drainage (AMD)
Protection of Groundwater and surface water	1. Where the water table is penetrated by drilling and the water flows out onto the surface, a furrow needs to be dug that diverts the water to vegetation. 2. All boreholes should be capped and labelled. In the instances where water is encountered the water should be sampled and tested 3. Water saving measures should be always applicable. No taps or pipes left to run, leaks to be detected immediately. Vehicles only to be washed with buckets, not running water. 4. Implement a stormwater management program to separate dirty and clean water. 5. Implement dust suppression techniques, such as water spraying, dust suppressant chemicals, etc. at dust generation points like crushing and drilling sites and along overhaul roads. 6. Hazardous materials must be managed within designated spill containment/bunded systems. 7. Oil spill kits should be always available. 8. Conduct routine inspections and maintenance of structures, equipment, and storage areas. 9. Regular service of vehicles in designated repair bays. 10. Refueling of vehicles only in designated areas. 11. Minimise contact of substances with water through appropriate storage and stormwater management plans
Sewage and grey water from temporary	Use of the toilets instead of the veld.
	If grey water can be collected from ablution facilities at the site it should be recycled and: o Used for dust suppression.

portable toilets on site	○ Used to water vegetable gardens or to support a small nursery in local communities (as and when agreed upon by such communities). ○ Used to clean equipment.
Inefficient use of water resources	– To ensure compliance with all legal obligations: – All plant and surface infrastructure (e.g waste rock dumps, stormwater diversion channels) are to be designed and constructed according to national standards and geotechnical recommendations to prevent surface water and groundwater contamination. – Ensure erosion control and prevention measures are in place during construction. – Ensure any new laydown areas that will be used for construction of the mine are located outside of stormwater catchment areas. – Installation of diversion structures to divert non-contact surface water away and around the mining operations. – Refuelling shall be undertaken in a designated area. – All stationary vehicles and machinery must have drip trays to collect leakages of lubricants and oil during any field repairs or emergency maintenance. – In the event of pollution, polluted soils must be collected and disposed of at an approved site. – A 'good housekeeping' policy shall be adopted across the mining area
Prevention of catastrophic contamination from potential heap leach pad failure	– Establish early warning systems are in place. – Ensure the installation of appropriate liners to prevent leaks. – Prevent overstocking the heap leach pad. – Routine inspection of the leak detection system and the double liner system. – Establish a network of monitoring boreholes to detect any leakages from the heap leach pad.
Any hazardous fluid or lubricating chemicals used could enter the aquifer or surface water environment causing pollution	– Hazardous waste disposal facilities need to be approved by the MEFT prior to construction and / or meet industry standards to prevent pollution events from occurring. – Temporary waste disposal facilities will be provided for the collection of waste, which will be removed regularly by a reputable contractor to the permitted waste disposal site. – Chemical and hydrocarbon spillages from trucks, conveyors and pipelines will be cleaned up timeously to prevent contamination. – Water in the pollution control dams will be used for road watering for dust suppression, make up water where possible, industrial water or for construction. – The contractors' laydown areas are to be surfaced and will drain to a sump with silt traps and hydrocarbon collectors.

	– All chemicals, bulk fuels, oils and grease and any other hazardous substance, will be stored and handled as per all applicable legislation and national standards. – Portable chemical toilets will be provided during the construction phase. They will be routinely cleaned, and sewage disposed of at a licenced sewage treatment plant with the safe disposal certificate to be provided. – A sewage plant may be provided for during the operational phase and the treated water will either need to be contained in pollution control dams and will be recycled or if treated water is of high enough standard, it can be used for dust suppression. – Stabilisation ponds will have to be monitored regularly to ensure contact water is retained. This and other water retention systems will be placed on planned maintenance and routine inspection.
Monitoring requirements	– Take borehole water levels at the start of mining and at the end of mining operations. – Keep the records. – Monitor the use of water and keep records of daily requirements. – A monitoring network be established, and routine (quarterly to bi-annual) groundwater quality monitoring is conducted to increase the confidence of baseline values prior to mine construction and investigate the presence of poorer quality water.

Table 6 - Drainage mitigation measures

Responsibility	– Mining Manager – Site Manager – Employees
Potential issues or impacts	– Altered drainage system – Bulk groundwater abstraction on water availability – Flow changes in regional catchments – Altered/obstructed water flow
Protection of surface and groundwater quality	– Implement a stormwater management program to separate dirty and clean water. – Ensure early warning systems are in place. – Implement dust suppression techniques, such as water spraying, dust suppressant chemicals, etc at dust generation points like crushing and drilling sites and along overhaul roads. – Construct sedimentation/settling ponds to allow suspended solids to settle.
Avoiding modifications to the drainage patterns	– Ensure stream diversions accommodate and encourage natural water flow regimes as far as possible. – Ensure drainage channels can withstand increased flow.

and flow dynamics in local watershed areas	– Implement effective stormwater management program. – Create diversion in manner that reduces lag time
Prevention of the depletion of groundwater	– During peak production, bulks abstractions (via mine abstraction and local irrigation schemes) from the Summerdown Kalahari Aquifer may lead to the development of a localised drawdown. Below are the mitigation measures: – When demand exceeds supply, additional boreholes should be established rather than unsustainably increasing abstraction from the existing supply boreholes; – Discourage pumping from closely spaced boreholes. Maintain a minimum spacing of 1 km to avoid high local drawdown; – Maintain the conservative recommended pumping rates; – Liaison with farmers who intend to establish new irrigation schemes to apply for abstraction permits from the Department of Water Affairs as per the newly promulgated Water Resources Management Act No, 11 of 2013. Permits are to take cognisance of the existing abstractions in the local area; – Establish a network of monitoring boreholes in order to identify and observe the performance of the aquifer under different production conditions; – Conduct additional exploration and test pumps on adjacent properties to fully understand the aquifer resource and for water safety security; – Record volumes of abstraction and supply; – To maximise the re-use of water during the construction and operational phases to minimise the use of clean water no matter the source; – Good practises - use water effectively and efficiently by following the reduce-recycle-reuse approach, thereby influencing pumping schedules; and – A site wide water balance will be kept and updated on a regular basis.

8.5 SURFACE AND GROUNDWATER QUALITY AND LEVELS MONITORING

Every effort must be made throughout to preserve the quality of surface water and groundwater sources that the Proponent may impact. Containment of waste and chemicals and the correct disposal thereof must be of an acceptable standard. Personnel must report any unusual conditions and intersection with surface and groundwater immediately to the environmental coordinator.

The Department of Water Affairs require quarterly reporting for water quality of water from the sources for which a permit was required, namely, for abstraction permits and discharge permits.

Monitoring measures:

1. Daily and weekly observations for any leakages
2. Maintain a record of all abstracted volumes and report to DWA / MAWLR as per permit conditions.
3. Install water flow meters if required.
4. Maintain a monthly water balance.
5. Submit quarterly water quality tests for water and monitoring boreholes, effluent discharge points and any surface water bodies.
6. The monitoring network should include upgradient and downgradient boreholes in both the primary and secondary aquifers, and boreholes proximal to the WRD and heap leach pad. This will aid in understanding the connectivity between the two aquifers and monitor potential contamination plumes emanating from these structures.

9 WASTE MANAGEMENT PROGRAMME

9.1 INTRODUCTION

The construction and mining activities will generate both solid and liquid waste. The types of waste generated at the facility are classified as mineral and non-mineral waste. All non-mineral waste will eventually be removed from the mine site and will either be disposed of at the Windhoek – Kupferberg landfill site or Walvis Bay hazardous waste disposal site. The waste rock materials in the ML have been classified as non – acid generating.

9.2 OBJECTIVES

This waste management programme has been prepared to ensure the proper storage, transport, treatment, and disposal of waste and where possible will follow the waste hierarchy, which encourages waste avoidance and waste reduction followed by reuse, recycling, and reclamation, before waste treatment and waste disposal.

9.3 ROLES AND RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS

- Required to ensure that all waste generated during mining activities is removed and disposed of accordingly including providing evidence in the form of waste transfer receipts for the waste moved off site;
- Ensure no windblown rubbish pollutes the environment; and
- Remove waste on a regular basis to prevent vermin.

SITE MANAGER AND ENVIRONMENTAL COORDINATOR

- Required to inspect receipts and evidence of correct waste handling.
- Review waste management practices regularly during the construction and mining operations on site.

9.4 SOLID AND LIQUID NON-MINERAL WASTE

The mine site will set up a form of recycling system thus reducing its impacts associated with solid waste generation. Where possible the Proponent will implement measures to reduce, reuse and recycle waste generated as part of the operations of the mine. To achieve this a temporary waste storage facility will be required.

Waste will be controlled through prevention and mitigation measures as follows:

- Reduce, reuse, and recycle where possible.
- Storage of domestic waste on site may result in the attraction of unwanted scavengers and should be disposed of the accredited site as soon as is feasible, and
- Hydrocarbon and chemical contaminated solids have the potential to cause contamination to the soil, groundwater and/or surface water, thus correct storage and

disposal methods are required. Some of these materials can be recycled or used by other facilities.

Further management and mitigation measures are outlined in Table 7 below.

Table 7 - Waste mitigation measures

Responsibility	– Mining Manager – Site Manager – Employees
Potential issues or impacts	– Soil, surface water and ground water contamination due to spillage – Land and water pollution. – Loss of biodiversity – Infectious diseases
Waste Management Plan	The Proponent should compile a Waste Management Plan that should address as a minimum the mitigation measures included below
Hazardous waste	All mining vehicles (4x4 vehicles and trucks) and equipment on site should be provided with a drip tray/oil spill kit: – Drip trays and sealable containers are to be transported with vehicles wherever they go. – Drip trays should be cleaned daily, and spillage handled, stored, and disposed of as hazardous waste.
	All mining vehicles should be maintained regularly to prevent oil leakages. Maintenance of vehicles is not permitted to occur on site as far as reasonably possible, but if maintenance is to be undertaken on site, measures need to be put in place to avoid hydrocarbon spillages.
	Maintenance and washing of mining vehicles should be conducted at a suitable site/facility which adhere to the following: – The work area/facility should be lined to be impermeable. – The work area/facility should have an oil-water separator (oil trap) to collect any run-off from the washing and or maintenance activities, or be equipped with an oil and water separation system
	Spilled oil or fuel should be treated as hazardous waste, disposed of as it occurs in the appropriate hazardous waste containers (sealable drums) on site, and removed off site at the end of each day to the closest recognised, appropriate hazardous waste disposal site in the vicinity or as soon as possible when working in remote areas. All such waste should be provided to specialists in the handing and treatment of such materials

	All hazardous substances (e.g., fuel, grease, oil, drilling fluids etc.) or chemicals should be stored in a specific location at the mining campsite on an impermeable surface which is bunded
General waste	The mining site should be always kept tidy. All domestic and general waste produced daily should be contained: – No waste may be buried or burned. – No waste is to be left uncontained, in suitable containers, overnight. – Waste containers (bins) should be emptied regularly and removed from site to the nearest official waste disposal site. All recyclable waste needs to be taken to the nearest recycling depot if available. – Enough separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such. – Mining personnel should be sensitised to dispose of waste in a responsible manner and not to litter. – No waste may remain on site after the completion of the project
Residual mineral samples	Samples that will not be used for further analysis, or submitted to MME should be taken off site or used (with the required permission from the affected landowner and/or tenant) to repair any possible damaged roads. No samples are to be dumped at site or in the vicinity of the site as to not affect rehabilitation efficiency through physical and chemical pollution of weathering samples.
Littering and environmental contamination from waste	– No littering by workers shall be allowed. – All litter on and around the site must be picked up and placed in the bins provided.
	– The site should be always kept tidy and free of litter. All domestic and general waste produced daily should be cleaned and contained daily. – No solid waste landfill will be established at the site. – No waste shall be burned or buried anywhere unless permitted to do so. – Waste shall be collected and shall be removed regularly to avoid bad odours. – Hazardous and non-hazardous waste shall be always stored separately.
Environmental contamination	– Hydrocarbon and chemical contaminated solids must be stored correctly and disposed of by registered companies.

from liquid waste	– Safe disposal certificates must be kept and provided to the project manager on request.
Sewage and grey water from temporary portable toilets on site	– Portable toilets such as portable camping units, must be provided during mining: o At all drill sites – Discharging of the portable units are to be conducted at an existing suitable facility. – The Solid Waste division of the town council should be contacted should permission be sought to dump at the landfill site
Monitoring Requirements	– Monitor whether the provisions set out in this ESMP concerning waste management is being applied as per instructions. – All non-compliances should be recorded and discussed at weekly site meetings and timeous remedial actions taken. – All guilty parties that are in contravention of the provisions set out for managing waste should be given a penalty and according to the severity of the impact appropriate steps taken

9.5 WASTE DISPOSAL MONITORING

Certificates providing the safe disposal of waste from a permitted hazardous waste disposal site must be provided to the manager upon request.

10 SPILL MANAGEMENT PROGRAMME

10.1 INTRODUCTION

The uncontrolled release of fuels and other chemicals has the potential to result in the contamination of soil, groundwater, and surface water, which may lead to serious environmental harm. On this basis, the storage and use of fuels or other chemicals must be managed to minimise the risk of a release, and measures must be in place to promptly address impacts should a release occur.

10.2 OBJECTIVES

This spill management plan has been prepared to minimise the potential for the uncontrolled release of fuels, oils and other chemicals. Preventative measures to minimise the potential for a spill are listed. Should a spill occur, this plan provides guidance for the Proponent on the appropriate spill response measures.

10.3 ROLES AND RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS
Required to implement the spill prevention and response measures listed below.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR
Required to ensure that appropriate spill prevention measures (listed below) are implemented and that any spills have been appropriately managed and reported.

10.4 SPILL PREVENTION MEASURES

The following management measures are to be implemented by the proponent:

- Spill kits are to be made available throughout the site. The kits are to include, as a minimum, the following items:
  - Absorbent materials
  - Shovels
  - Heavy-duty plastic bags
  - Protective clothing (e.g., gloves and overalls), and
- Major servicing of equipment shall be undertaken off site or in appropriately equipped workshops.
- Provision of adequate and frequent training on spill management, spill response and refuelling must be provided to all onsite staff and contractors.
- Fuels, lubricants, and chemicals are to be stored within appropriately sized, impermeable bunds or trays with a capacity not less than 110% of the total volume of products stored.

- All fuel and chemical storage and handling equipment (including transfer hoses, etc.) shall be well maintained.
- Storage and handling of fuels and chemicals shall be in compliance with relevant legislation and regulations.
- No refuelling is to take place within 50 metres of groundwater boreholes, surface water or streams, and
- MSDS are to be kept for each chemical used on site. These must be easily accessible to all personnel.

10.5 SPILL RESPONSE MEASURES

The primary concern, in the event of any spill, is the health and safety of any residents/ employees and contractors in the vicinity. Of secondary, but highly significant, importance, is the protection of water sources and then soil and vegetation.

The following points therefore apply to all areas on the site:

- Assess the situation for potential hazards.
- Do not come into contact with the spilled substance until it has been characterised and necessary personal protective equipment (PPE) is provided.
- Isolate the area as required.
- Notify the site manager or safety, health, and environmental coordinator.

The following measures are to be implemented in response to a spill:

- Spills are to be stopped at source as soon as possible (e.g., close valve or upright drum)
- Spilt material is to be contained to the smallest area possible using a combination of absorbent material, earthen bunds, or other containment methods.
- Spilt material is to be recovered as soon as possible using appropriate equipment. In most cases, it will be necessary to excavate the underlying soils until clean soils are encountered.
- All contaminated materials recovered after a spill, including soils, absorbent pads, and sawdust, are to be disposed to appropriately licenced facilities.
- The manager or safety, health and environmental coordinator are to be informed as soon as possible in the event of a spill, and
- A written Incident Report must be submitted to the manager.

Further management and mitigation measures are outlined in Table 8 below.

Table 8 - Spill mitigation measures

Responsibility	– Mining Manager – Site Manager – Employees
Potential issues or impacts	Soil, surface water and ground water contamination due to spillage
Stored Hazardous Chemicals	– Hazardous chemicals are to be stored in bunded areas. – Hazardous chemicals (such as fuels) are to be handled over areas provided with impervious surfaces. – Spills of hazardous chemicals are to be contained and cleaned-up to ensure protection of the environment. – All the necessary PPE required for the safe handling and use of petrochemicals and oils shall be provided to, and used or worn by, the onsite staff
Machinery and Equipment Maintenance	– Major servicing of equipment shall be undertaken off site or in appropriately equipped workshops. – For small repairs and required maintenance activities all reasonable precautions to avoid oil and fuel spills must be taken (e.g., spill trays, impervious sheets). – Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks. – All the necessary PPE required for maintenance activities must be issued to staff whose duty it is to manage and maintain the machinery and equipment.

Table 9 below shows the environmental risks and issues, and mitigation and monitoring measures for the Spill of hazardous substances.

Table 9 - Spill of hazardous substances

Responsibility	– Mining Manager – Site Manager	
Potential issues or impacts	Hydrocarbon and chemical handling and storage can cause spillages that lead to groundwater contamination and soil contamination.	
Management/ Mitigation measures	Safe delivery and handling	1. Training employees and toolbox talks 2. Good housekeeping across the site 3. Fuel and chemicals are handled with care. 4. Spill kits to be at designated areas across the site or available for use during refuelling, fuel/chemical delivery, or use. Absorption material should be available and at hand. Where

		sawdust is used it should be cleaned up immediately and not left for long periods as this poses a fire hazard 5. Any major spill is reported once containment has been achieved. 6. Plant and equipment to be well maintained and serviced regularly. 7. In the field, the use of hydrocarbons under 200 litres can be used for mobile refuelling or servicing
	Storage	1. All tanks to be stored on a non-porous floor and within a bunded area. 2. Bund to be capable of storing at least 110% of the volume of the largest tank 3. All containers to be suitable for use and not damaged 4. Tanks are locked at all time 5. Spill kits available at storage locations and around the site at suitable locations
	Refuelling	1. Drip tray to be used during refuelling of vehicles and on an impermeable flat surface where possible. 2. A funnel should be available and used to avoid spillage during decanting
	Rehabilitation	Contaminated soils should be removed and deposited on lined storage areas for rehabilitation purposes. Rehabilitation can take place naturally by adding water, air and fertiliser. The process can be accelerated by using special additives that will breakdown the hydrocarbons. Once rehabilitated the soils can be used for revegetating WRD slopes.
Monitoring requirements	– Daily observations when fuels/chemicals are delivered and handled. – Supervision during refueling. – Weekly observations monitor containment and storage. – Establish an internal land clearing permit system that restricts advance clearing. – Monitor the level of hydrocarbons in contaminated soils after a year of rehabilitation. – Monitor each year until the soils are ready for re-use in revegetation projects.	

For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the office of the Ministry of Environment, Forestry and Tourism (MEFT) informed of the incident (telephone +264 61 284 2111). All correspondence with MEFT should be undertaken by the General manager.

For the clean-up of smaller spills, the relevant material safety data sheet (MSDS) should be consulted to determine the appropriate clean-up procedure. Basic spill response training will be provided as part of the site environmental induction, spill response equipment, including relevant MSDS copies, will be provided in areas where potentially environmentally hazardous chemicals may be used.

10.6 SPILL REPORTING

All major petroleum product spills should be reported to the Ministry of Mines and Energy (MME) on Form PP/11 titled "Reporting of major petroleum product spill", issued by the ministry.

10.7 REHABILITATION OF CONTAMINATED SOILS

All soils that are contaminated with chemicals and or hydrocarbons should be taken to the rehabilitation area. A procedural manual for rehabilitating contaminated soils on site should be developed.

11 AIR QUALITY MANAGEMENT PROGRAMME

11.1 INTRODUCTION

This air quality management plan describes the strategies and procedures that will be implemented to ensure that the health and amenity of construction workers and nearby sensitive receptors are protected from elevated concentrations of airborne dust and other gaseous emissions (e.g., oxides of nitrogen; nitrogen dioxide, particulate matter; sulphur dioxide and carbon monoxide). Typically, the gases present in a mining environment include carbon monoxide, hydrogen sulphide, sulphur dioxide, methane, nitrogen dioxide and ammonia. In cases where generators and other machinery are used, there will be some release of exhaust fumes that will impact the immediate vicinity but will be of short duration.

11.2 OBJECTIVES

This air quality management plan has been prepared to prevent deterioration of air quality and to minimise the potential for emitted dust and airborne pollutants. Preventative measures are listed below.

11.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS
To implement the necessary management practices to meet the objectives listed above.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR
To ensure that the objectives listed above are being met and to provide performance feedback to the mining manager.

11.4 AIR QUALITY MANAGEMENT PROCEDURES

Activities that may potentially emit dust and airborne pollutants during the operations include the following:

- Vehicle movements
- Machinery operations

The Proponent will minimise the potential for dust generation and the emission of airborne pollutants by undertaking the following management measures, as required:

- Unpaved road surfaces will be maintained as required.
- Appropriate speed limits will be set and enforced.
- Dust suppressions measure and spraying of the ore.
- Vehicles and machinery will be maintained so as to limit exhaust fume emissions.

Further management and mitigation measures are outlined in Table 10 below.

Table 10 - Air quality mitigation measures

Responsibility	– Mining Manager – Site Manager
Potential issues or impacts	– Impaired visibility for drivers and employees. – Respiratory related health issues.
Dust and fumes	Appropriately rated and fitted dust masks should be given to personnel working in areas of dust exposure.
	Grey water should be used for dust suppression on a constant basis if available and as required.
	Maintain speed limits of haul trucks and vehicles on site.
	Materials transfer points should be done using water sprays at the tip points
	Apply water sprays on regularly travelled, unpaved sections.
	To reduce dust emissions, water sprays should be utilized to keep the ore wet
Monitoring requirements	– Dustfall monitoring network must be maintained around the site boundary. – Dustfall collection should follow the ASTM method.

11.5 AIR QUALITY MONITORING

Visual monitoring of mining activities can ensure the minimum discharge of airborne dust and other emissions according to the air quality management programme.

1. Daily observations
2. Air Quality Monitoring:

A depositional dust fall monitoring network, comprising of eight (8) single dust fall units, should be maintained and the monthly dust fall results used as indicators to tract the effectiveness of the applied mitigation measures. Dust all collection should follow the ASTM method.

11.5.1 RECOMMENDATIONS

- Dust fall monitoring network be supplemented by periodic ambient PM_{10} and $PM_{2.5}$ monitoring to determine whether the air quality objectives are being met (Airshed, 2023).
- Use chemical suppressants such as dust-a-side on unpaved roads to reduce dust.

11.6 ODOURS, NOISE AND VIBRATION IMPACTS

The sensitive receptors within proximity to the site are farm Otjere and farm Ekuja. Activities related to the mining activities have the potential to generate nuisance odours, noise and vibration that can impact the quality of life for neighbouring residents and tourism activities. However, this potential impact is minor as the farms are located ~2.5 km and 3.5 km away from the mine site.

The Omitiomire Copper mine will be a 24-hour operational mine, therefore the Proponent should draw measures to ensure potential odours, noise and vibration sources are mitigated through measures such as:

- Avoid noise generating activities at night, by ensuring noisy activities are avoided especially at night;
- Ensure appropriate measures are put in place to rectify odours, noise and vibration complaints, should they occur.
- Scheduling of works to avoid disturbance between the hours of 7 pm and 5 am (Airshed, 2023), and
- Procedures for receiving complaints from nearby land users or residents to be in place and mitigation measures to be implemented should construction and mining generate excessive odours, noise, and vibration, which is unexpected.

Occupational noise and vibration are managed through the health and safety management plan and therefore not applicable to this ESMP.

Table 11 below shows the environmental risks and issues, and mitigation and monitoring measures for noise aspects.

Table 11 – Noise and vibration aspects

Responsibility	– Mining Manager – Site Manager
Potential issues or impacts	- Noise and vibration complaints from the local farming community.
Management/ Mitigation measures	– All diesel-powered equipment and plant vehicles should be kept at a high level of maintenance. This should particularly include the regular inspection and, if necessary, replacement of intake and exhaust silencers. Any change in the noise emission characteristics of equipment should serve as trigger for withdrawing it for maintenance. – In managing noise specifically related to vehicle traffic, efforts should be directed at: – Minimising individual vehicle engine, transmission, and body noise/vibration. This is achieved through the implementation of an

	equipment maintenance program to maintain road surfaces regularly to repair potholes etc. – Keep all roads well maintained and avoid steep inclines or declines to reduce acceleration/brake noise. – Avoid unnecessary equipment idling. – Minimising the need for trucks/equipment to reverse. This will reduce the frequency at which disturbing but necessary reverse warnings will occur. Alternatives to the traditional reverse 'beeper' alarm such as a 'self-adjusting' or 'smart' alarm could be considered. These alarms include a mechanism to detect the local noise level and automatically adjust the output of the alarm is so that it is 5 to 10 dB above the noise level near the moving equipment. The promotional material for some smart alarms does state that the ability to adjust the level of the alarm is of advantage to those sites 'with low ambient noise level' Invalid source specified. – Where possible, other non-routine noisy activities such as construction, decommissioning, start-up, and maintenance, should be limited to day-time hours. – A noise complaints register must be kept. – Provision of general notices to the community in the form of notice boards indicating blast times and dates. – Equipment and blast methods to be employed should be reviewed to ensure the quietest available technology is used. Equipment with lower sound power levels must be selected in such instances and vendors/contractors should be required to guarantee optimised equipment design noise levels. – As far as is practically possible, sources of significant noise should be enclosed. The extent of enclosure will depend on the nature of the machine and their ventilation requirements. Pumps are examples of such equipment. – Equipment should be sited as far away from NSRs as possible. Also: – Machines used intermittently should be shut down between work periods or throttled down to a minimum and not left running unnecessarily. This will reduce noise and conserve energy. – Plants or equipment from which noise generated is known to be particularly directional, should be orientated so that the noise is directed away from NSRs. – Acoustic covers of engines should be kept closed when in use or idling. – Doors to pump houses should always be kept closed.

	– Regular and effective maintenance of equipment and plants are essential to noise control. Increases in equipment noise are often indicative of eminent mechanical failure. Also, sound reducing equipment/materials can lose effectiveness before failure and can be identified by visual inspection. – Lubrication of machinery and equipment with vibrating parts can reduce noise levels. – - Measure the distance between blasting operations and POIs of concern. – Blasting designs should consider blasting levels and ground vibration levels should be adhered to. – Monitor meteorological information prior to blasting to ensure blasting schedules are conducted during conditions that will have less impacts; – Changes to the timing design to facilitate less charge mass per delay, – Review the blast design to assess the possibility of using electronic initiatives as opposed to conventional systems; – Video recording and analysis of blasting to understand the extend of impact; – Maintain a complaint register, particularly related to blasting impacts to understand the impacts from the receptor's point of view; – For occupational health and safety, compliance to the 472 m unsafe zone.
Monitoring requirements	– Sources of excessive noise will be investigated, and recommendations made for mitigation. – Keep complaints register. – Noise monitoring at sites where noise is an issue or may become an issue is essential. Annual noise sampling for a period of 20 minutes for day- and night-time at NSRs surrounding the Omitiomire site should be incorporated in the annual environmental noise monitoring program; – Any change in the noise emission characteristics of equipment should serve as trigger for withdrawing it for maintenance. – If noise-related complaints are received short term ambient noise measurements should be conducted as part of investigating the complaints. The results of the measurements should be used to inform any follow-up interventions. The investigation of complaints should include an investigation into equipment or machinery that will likely result or result in noise levels annoying

	to the community. This could be achieved with source noise measurements. – Review ground vibration results and blast information summary. – Independent audits should be undertaken to monitor ground vibrations and air blasts and should complaints persist.

12 SOIL MANAGEMENT PROGRAMME

12.1 INTRODUCTION

The soil quality management plan describes the measures that will be implemented to ensure the protection of the soil on site throughout construction and operational phases of the project. A comprehensive soil quality management plan/programme ensures that the topsoil on the project site is conserved for re-use during decommissioning, mine closure and rehabilitation.

12.2 OBJECTIVES

This soil management plan has been prepared to guide the conservation of the topsoil at the Omitiomire site and prevent the deterioration therefore to ensure that it is of the correct quality for mine closure and rehabilitation.

12.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS
To implement the necessary management practices to meet the objectives listed above.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR
To ensure that the objectives listed above are being met and to provide performance feedback to the Mining Manager.

Table 12 below shows the environmental risks and issues, and mitigation and monitoring measures for soil aspects.

Table 12 - Soil mitigation measures

Responsibility	– Mining Manager – Site Manager
Potential issues or impacts	– Mining can cause changes to soil and landscape. – The land clearing activities by mechanical methods would result in erosion issues.
Mitigations measures	
Changes to soil and landscape	– Topsoil should be separately stockpiled to be re-spread when backfilling. – Soils to be stored for longer than three years should preferably not be stockpiled in piles greater than 1.5 m in height. – Slopes of the stockpiles should be constructed to minimise the chances of erosion of the soils.

	– Topsoil stockpiles should be vegetated as soon as possible to prevent loss of the resource by wind and water erosion and to retain its micro-biological functions. – Monitor vegetation on soil stockpiles to prevent erosion and loss of topsoil. – Fertilize and vegetate soil stockpiles where required. – Equipment must be in good condition to ensure that lubricant/fuel spills do not contaminate the site. – Ensure soils are replaced in layers in which they were removed. – Disturbed or excavated areas should be backfilled with the soil material that was removed from it, shaped to free draining slopes and planted with sustainable grass/shrub/tree species. – Ensure topsoil stockpiles are not positioned down gradient of potential contamination zones. – Scarification of compacted soil. – Flow dissipation measures to reduce velocity of runoff.
Land clearing	– Clear vegetation in a manner that encourages plant regrowth such as stem cutting where possible. – Avoid clear felling of vegetation in areas viewed as erosion prone – i.e. ephemeral rivers or steep slopes (hill areas). – Divert water away from unvegetated areas – Reroute or limit the size of or avoid access route(s) in areas viewed as erosion prone – i.e. ephemeral rivers; steep slopes (hill areas). – Where new tracks have to be made off the main routes, the routes should be selected causing minimal damage to the environment – e.g. use the same tracks; cross drainage lines at right angles; avoid placing tracks within drainage lines; avoid collateral damage (i.e. select routes that do not require the unnecessary removal of trees/shrubs, especially protected species). – Rehabilitate all new tracks created as far as practically possible. – Construct permanent non-gravel or tar roads along vehicle route(s) most often used. – Rehabilitate eroded areas annually – i.e. after the rainy season (during winter months). – Implement and maintain erosion control measures where applicable – e.g. cross drains on slopes, erosion control blankets and matting etc.
Soil contamination	– Excavate and remove contaminated soil and replace with uncontaminated soil. – Utilise drip trays where possible to prevent leaks from contaminating the soil. – Store fuel and chemicals in bunded areas and do regular inventory checks.

	– Water with potential to contaminate soils should not be used for dust suppression. – Remediate contaminated soils using appropriate techniques, such as excavation and removal, soil washing, bioremediation, or chemical treatment.

13 TRAFFIC MANAGEMENT PROGRAMME

13.1 INTRODUCTION

There may be an influx of vehicles from light to heavy vehicles and abnormal vehicles on the C31 and D2166 routes during construction and operation of the Omitiomire mine. The traffic management plan therefore describes the strategies that will be used by the Proponent to manage traffic and ensure the maintenance of the road.

13.2 OBJECTIVES

This traffic management plan has been developed to prevent road accidents, manage traffic and ensure the maintenance of the C31 and D2166 district routes which provide access to the mine. Preventative measures are listed below.

13.3 RESPONSIBILITIES

WORKFORCE AND ALL CONTRACTORS
To implement the necessary management practices in order to meet the objectives listed above.

SITE MANAGER/ ENVIRONMENTAL COORDINATOR
To ensure that the objectives listed above are being met and to provide performance feedback to the Mining Manager.

Table 13 below shows the environmental risks and issues, and mitigation and monitoring measures for traffic aspects.

Table 13 - Traffic mitigation measures

Responsibility	– Site Manager
Potential issues or impacts	– Increased traffic volumes on existing roads. – Wear and tear of existing road surfaces.
Mitigations measures	
Increased Traffic on road and vehicular accidents	– Designs of the intersection layouts of the mine access road must address design standards and elements such as alignment, sign distances, cross-sections and provisions for other road users including pedestrians, and must be legally compliant. – Inspect mine vehicles and contractors' vehicles weekly for clean and operational taillights, indicators, reflective signage and reverse horns/beepers to ensure visibility of vehicles, especially at night. – The minimum bell-mouth radii at this intersection should be 15 meters, to accommodate the tuning movements of large articulated trucks.

	– The needs of pedestrians should be taken into consideration in the planning and design of the access to the proposed site, as well as the design of the road infrastructure. – All employees and contractors must adhere to the speed limits and other road safety procedures, both on the mine site, and on public roads. Include speed limits in the induction and enforce the speed limits. – Provide large visible road signage, indicating the presence of heavy vehicle traffic at least 500 m before, on either side of the mine site access road intersection along the road. – Inspection of the site access district routes to determine the times of need to maintain such routes. – Road safety issues must be included as part of the overall on-site safety training and at induction.
Monitoring requirements	
– Daily observations – Weekly checks	

14 ARCHAEOLOGICAL AND HERITAGE PROGRAMME

Areas of proposed Project is subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The "chance finds" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act, No. 27 of 2004), especially Section 55 (4): "a person who discovers any archaeological object must as soon as practicable report the discovery to the Council". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Table 14 below shows the environmental risks and issues, and mitigation and monitoring measures for Archaeological and heritage aspects.

Table 14 – Archaeological and heritage aspects

Responsibility	– Mining Manager – Site Manager
Potential issues or impacts	- Impact on heritage features
Management/ Mitigation measures	– All mine personnel and contractors should be made aware of the protected archaeological sites and the legal obligation to report any new findings to the NHC immediately. Should a heritage site or archaeological site be uncovered or discovered during either mining phases of the project, a "chance find" procedure should be applied in the order they appear below: – If operating machinery or equipment, stop work. – Demarcate the site with danger tape. – Determine GPS position if possible. – Report findings to foreman. – Report findings, site location and actions taken to superintendent. – Cease any work in immediate vicinity. – Visit the site and consult with any potentially affected community to determine whether work can proceed without damage to findings.

	– Determine and demarcate the exclusion boundary. – Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by an Archaeologist. – Inspect site and confirm addition to project GIS. – Advise the National Heritage Council (NHC) and request written. – Permission to remove findings from work area. – Recover, package and label findings for transfer to the National Museum (ESM, 2023).
	Should human remains be found, the following actions will be required (Kinahan, 2013): – Apply the chance find procedure as described above. – Schedule a field inspection with an archaeologist to confirm that remains are human. – Advise and liaise with the NHC and Police – Remains will be recovered and removed to either the National Museum or the National Forensic Laboratory. – Contact person at NHC: Rev. Soloman April; Tel: (061) 244 375/ 385/594
SPECIFIC MITIGATION DETAILS	
Archaeology	Obtain inputs from an Archaeologist to identify potential archaeological sites in the area and to determine further mitigation where necessary.
Monitoring requirements	1. Check that the archaeologist has given a written statement about the location of the known archaeological sites in the area vs the location of the drilling area. 2. Make sure no archaeological site is disturbed whilst excavation and recovery take place. 3. Make sure everything of importance, as identified by an appropriate specialist, is removed from site and declared safe by an Archaeologist before mining can continue on the site. 4. An annual site audit is essential, involving systematic monitoring typically utilizing a GIS-based system to facilitate periodic evaluations of conditions and risks.

14.1 RESPONSIBILITY

Operator - to exercise due caution if archaeological remains are found.
Foreman - To secure site and advise management timeously.
Superintendent - To determine safe working boundary and request inspection.
Archaeologist - To inspect, identify, advise management, and recover remains.

14.2 PROCEDURE

Action by person identifying archaeological or heritage material.
a) If operating machinery or equipment stop work.
b) Identify the site with flag tape.
c) Determine GPS position if possible.
d) Report findings to foreman,

Action by foreman
a) Report findings, site location and actions taken to superintendent.
b) Cease any works in immediate vicinity.

Action by superintendent
a) Visit site and determine whether work can proceed without damage to findings.
b) Determine and mark exclusion boundary.
c) Site location and details to be added to project GIS for field confirmation by archaeologist.

Action by archaeologist
a) Inspect site and confirm addition to project GIS.
b) Advise NHC and request written permission to remove findings from work area.
c) Recovery, packaging and labelling of findings for transfer to National Museum.

In the event of discovering human remains:
a) Actions as above
b) Field inspection by archaeologist to confirm that remains are human.
c) Advise and liaise with NHC and Police.
d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

15 IMPLEMENTATION OF THE ESMP

This environmental management plan:

A. Has been prepared according to a contract with the Proponent.

B. Has been prepared based on information provided to ECC up to March 2024

C. Is for the sole use of the Proponent, for the sole purpose of an ESMP.

D. Must not be used (1) by any person other than the Proponent or (2) for a purpose other than an ESMP.

E. Must not be copied without the prior written permission of ECC.

16 REFERENCES

Airshed.,(2023). *Air quality impact assessment for the proposed Mining Activities on ML 197 for the Omitiomire Copper Project, Khomas Region, Namibi*a. PG 44.

Airshed.,(2023*). Environmental noise impact assessment for the proposed mining activities on ML 197 for the Omitiomire Copper Project, Namibia.*

ESM (2023). *Heritage Impact Assessment for Omitiomire Copper Project on ML 197 near Windhoek in Khomas Region.*

Kinahan, D. J. (2013). *Archaeological mitigation report on the Omitiomire Project***.**