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REPORT ON:

ENVIRONMENTAL MANAGEMENT PLAN FOR THE AMENDMENT AND RENEWAL APPLICATION FOR THE !URIS AND BOBOS IRRIGATION SCHEME, OSHIKOTO REGION, NAMIBIA

PROJECT NUMBER: ECC-80-373-REP-04-D

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DEFINITIONS AND ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
ECC	Environmental Compliance Consultancy
EIA	Environmental Impact Assessment
EMA	Environmental Management Act, 2007
EMP	Environmental Management Plan
IFC	International Finance Corporation
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment Forestry and Tourism
MME	Ministry of Mines and Energy
PM	Project Manager

1 INTRODUCTION

1.1 BACKGROUND ON THE PROPOSED PROJECT

Environmental Compliance Consultancy (ECC) has been engaged by the Proponent, Three Musketeers Investment (Pty) Ltd, to apply for an amendment of their existing environmental assessment process and develop a scoping report and an environmental management plan (EMP) in terms of the Environmental Management Act, No. 7 of 2007 and its regulations. An amendment and renewal environmental clearance application will be submitted to the relevant competent authority for a record of decision: The Ministry of Environment, Forestry and Tourism (MEFT).

The Proponent intends to divide the current 500ha irrigation Project on farm Uris known as the !Uris irrigation scheme (hereinafter referred to as "The Project") into four 125ha portions. Each portion will be established on four individually owned farms. However, the current amendment and simultaneous renewal only cover three of the four farms. The fourth farm is reserved as a future site and that farm owner/investor will be responsible to conduct their own ESIA.

The Project is located approximately 23km west of Tsumeb. This EMP includes three of the four farms, of which two farm portions fall on farm Uris 481 and one farm portion lies to the south of farm Uris on farm Bobos 544.

1.2 ENVIRONMENTAL REGULATORY REQUIREMENTS

This EMP has been developed by following the requirements of the Environmental Management Act, No. 7 of 2007 and its regulations and satisfies the requirements for an amendment and renewal application.

Legislation that should be adhered to is contained in Table 1.

Table 1 - Applicable laws, regulations and best practice methods

National regulatory regime	Relevance to the project
Constitution of the Republic of Namibia of 1990	Social protection
The Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (Act 36 of 1947) and amendments	Social and Biophysical protection
Environmental Management Act, No. 7 of 2007 and its regulations, including the Environmental Impact Assessment Regulations, No. 30 of 2012	Environmental Management
Soil Conservation Act, No. 76 of 1969 and the Soil Conservation Amendment Act, No. 38 of 1971	Biophysical protection
Water Act, Act 54 of 1956	Water source protection
The Forestry Act, No. 12 of 2001 as amended by the Forest Amendment Act, No. 13 of 2005	Vegetation protection
Nature Conservation Ordinance Act, No. 4 of 1975 and its regulations.	Conservation and protection of wildlife
Labour Act, No. 11 of 2007: Regulations relating to the Health and Safety of Employees at Work (GN 156/1997).	Social Protection
Minerals (Prospecting and Mining) Act 33 of 1992 sections 50 and 52	Biophysical and social protection
Nature Conservation Ordinance Act No. 4 of 1975 and its regulations.	Biodiversity protection
Labour Act, No. 11 of 2007 and regulations relating to the Health and Safety of Employees at Work (No. 156 of 1997)	Social protection
National Heritage Act, No. 27 of 2004.	Heritage protection
Draft Pollution Control; and Waste Management Bill (1999)	Biophysical landscape protection
Hazardous Substances Ordinance Ordinance No. 14 of 1974	Biophysical landscape protection

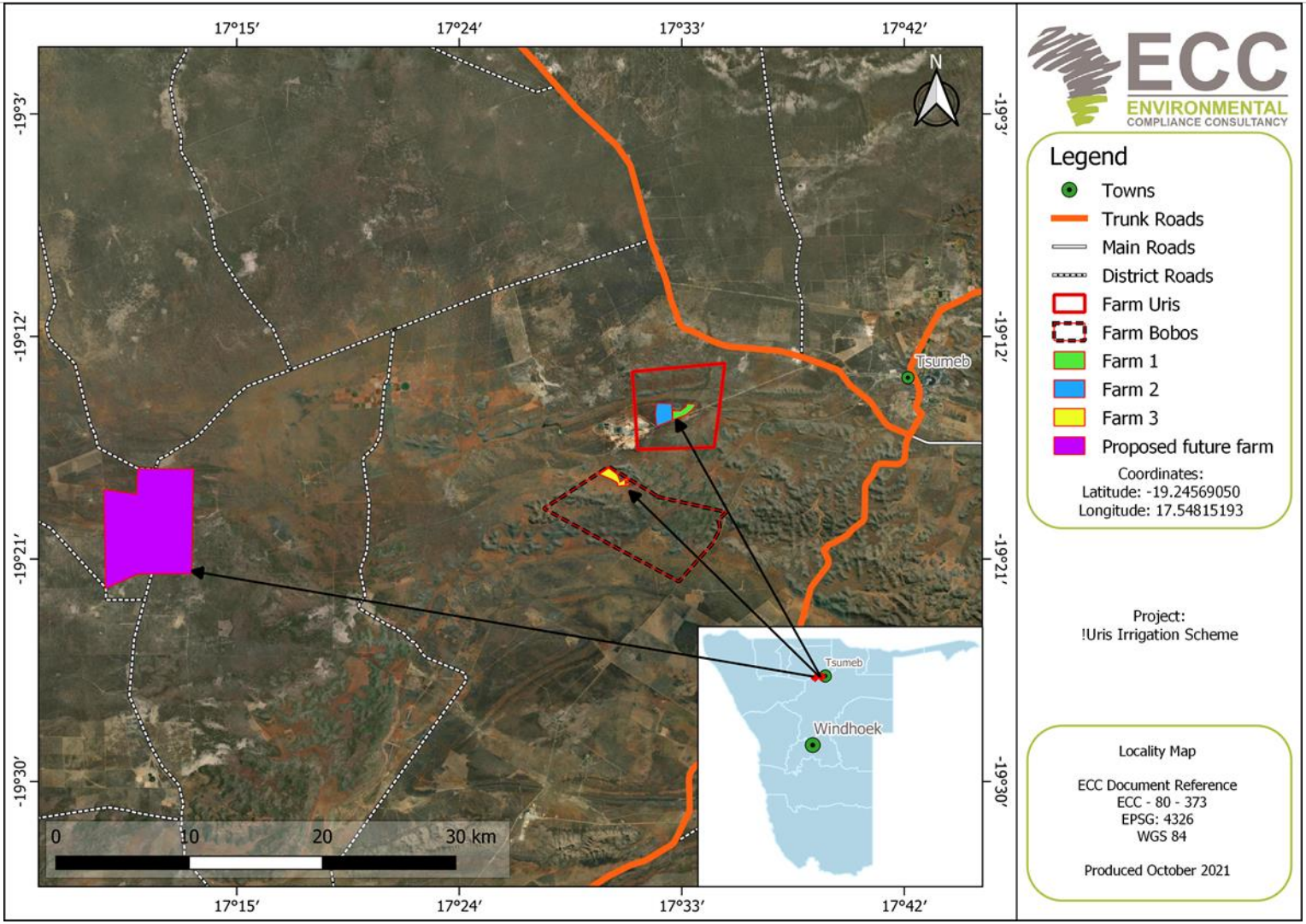

Figure 1 - Location of the proposed irrigation Project

1.3 PURPOSE AND SCOPE OF THIS REPORT

This EMP provides a logical framework, proposed mitigation measures and management strategies for the activities associated with the proposed amendment to the irrigation Project, in this way ensuring that the potential environmental and social impacts are mitigated and minimised as far as practically possible and that statutory and other legal obligations are adhered to and fulfilled. Outlined in the EMP are the protocols, procedures and roles and responsibilities to ensure that management arrangements are effectively and appropriately implemented.

This EMP forms an appendix to the environmental scoping report and impact assessment and has been based on the findings of the assessment; therefore, the environmental scoping report should be referred to for further information on the proposed Project, assessment methodology, applicable legislation and assessment findings.

This EMP is a live document and shall be reviewed at predetermined intervals, or updated when the scope of work alters, or when further data or information can be added. All personnel working on the Project will be legally required to comply with the standards set out in this EMP.

The scope of this EMP includes all activities carried out during the construction and operational stages of the Project.

The Proponent shall be responsible for each phase of the Project and the implementation of this EMP. The current understanding of each phase is as follows:

- **Construction phase**: The amendment includes the construction of three water pipelines from the Tschudi copper mine to the three farm portions.
- **Operations phase**: The management of crops, harvesting, pest control, application of fertilisers and the maintenance of irrigation infrastructure.
- **Decommissioning phase**: The decommissioning and rehabilitation plan for the proposed Project is unknown at this stage. Once the Proponent is informed of the time frame of water to be supplied to the site, a rehabilitation or decommissioning plan shall be prepared.

1.4 MANAGEMENT OF THIS EMP

The Proponent will hold the amended environmental clearance certificate for the proposed irrigation Project and shall be responsible for the implementation and management of this EMP. The implementation and management of this EMP and thus the monitoring of compliance shall be undertaken through daily duties and activities, as well as monthly inspections.

This EMP shall be circulated to all contractors and made available on ECC's website.

1.5 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS OF THIS EMP

This EMP 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 independently.

Where there is any conflict between the provisions of this EMP 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 and statutory requirements are to take precedence.

The information contained in this EMP has been based on the Project description as provided in the environmental scoping report. Where the Project methods alter, this EMP may require updating and potential further assessment undertaken.

1.6 ENVIRONMENTAL COMPLIANCE CONSULTANCY

Environmental Compliance Consultancy (ECC), a Namibian consultancy with registration number CC/2013/11401, has prepared this document on behalf of the Proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across Southern Africa in the public and private sector. ECC is independent of the Proponent and has no vested or financial interest in the proposed Project except for fair remuneration of professional services rendered.

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

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2 PROJECT MANAGEMENT PERSONNEL

The Proponent shall provide a Project team to oversee the proposed construction and proposed operational activities, which shall be composed of the Proponent's personnel and contractors. A nominated role shall be identified to ensure the management and implementation of this EMP throughout the Project is carried out, which shall be supported by the Proponent.

2.1 ORGANISATIONAL STRUCTURE, ROLES AND RESPONSIBILITIES

The Proponent shall be responsible for:

- Ensuring all members of the Project team, including contractors, comply with the procedures set out in this EMP;
- Ensuring that all personnel 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 EMP and meet the responsibilities listed below.

The key personnel and environmental responsibilities of each role through the Project life are presented in Table 2.

Table 2 - Roles and responsibilities

Role	Responsibilities & duties
Proponent/Farm Owners	– Overall responsibility for the implementation and management of this EMP. – Ensure the environmental policy is communicated to all personnel throughout the proposed Project. – Responsible for providing the required resources (including financial and technical) to complete the required tasks.
Project Manager (PM)	The owners of the individual farm portions will be responsible for ensuring compliance with this EMP, including overseeing the construction works, day to day activities during operations and routine and non-routine maintenance works during operations, as well as the decommissioning of the development. – Ensuring all personnel are aware of the commitments made in this EMP and any other relevant regulatory requirements applicable to the Project; – Responsible for the management, maintenance and revisions of this EMP, ensuring adequate resources are made available for implementation of this EMP; – Maintain the community issues and concern register and keep records of complaints. – Ensuring all employees and contractors participate in a site Induction process prior to commencing work on the Project; – Maintain up to date register of employees who have completed the site Induction; and – Provisioning of environmental awareness/management training and inductions for all employees; – Ensuring that best environmental practice is undertaken throughout the duration of the Project; – Report any non-compliance or accidents to the Regulatory Authority.
Site Managers / Contractors	Appointed to manage the performance of the construction and operational maintenance activities. Responsible for the implementation of this EMP and ensuring all activities are compliant with this EMP, as well as: – Managing the preparation and implementation of method statements for certain activities, ensuring the site manager reviews all method statements and the relevant environmental protocols are incorporated;

Role	Responsibilities & duties
	– Reporting any non-compliance or accidents to the project manager; – Ensuring that all staff attend a site induction session before commencement of any work on-site and that they are adequately informed of the requirements of this EMP; – Ensuring that all contract workers, sub-contractors and visitors to the site are conversant with the requirements of this EMP, relevant to their roles on site and adhere to this EMP at all times; and – Receiving, responding to and recording complaints.
Employees / Contractor employees	Responsible for being compliant with this EMP throughout the construction works, in addition to: – Ensuring they have undertaken a site induction and are conversant with the requirements of this EMP; – Ensuring appropriate briefings for certain activities have been provided and fully understood; – Adherence to this EMP at all times; – Reporting of any operations and conditions that deviate from the EMP or any non-compliant issues or accidents to the Site Manager/Contractor.

2.2 CONTRACTS

Any contractors hired during the construction works or maintenance activities during the operational phase shall be compliant with this EMP and shall be responsible for the following:

- Undertaking activities in accordance with this EMP 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/or project manager; and
- Ensuring appropriate corrective or remedial action is taken to address all environmental
  hazards and incidents reported by employees and subcontractors.

2.3 EMPLOYMENT

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

- In liaison with local government, the community, stakeholders and relevant 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;
- 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 pool of unemployed workers living in the local area; and
- Every employee hired must be provided with a valid employment contract stating, the position hired for and the hourly remuneration offered.

3 COMMUNICATION AND TRAINING

3.1 COMMUNICATIONS

The project manager and site manager shall communicate any environmental issues to the Project team through the following means (as and when required):

- Site induction;
- Internal and external audits and site inspections;
- Toolbox talks, including instruction on incident response procedures; and
- Briefings on key Project-specific environmental issues.

This EMP shall be distributed to the Project team including any contractors and personnel working on the 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 construction and operational activities, communication amongst the management team shall include discussing any complaints received and actions to resolve them, any inspections, audits or non-conformance with this EMP and any objectives or target achievements.

3.2 ENVIRONMENTAL EMERGENCY AND RESPONSE

The PM will be the primary contact person in the event of an environmental emergency. The project manager has the authority and independence to request reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse environmental impact be anticipated.

In the event of an incident that requires emergency services, the following services should be contacted, presented in Table 3.

Table 3 - Emergency contact details

Town	Ambulance	Police	Fire brigade
Tsumeb	+264 (67) 22-1082	+264 (67) 1-0111	+264 (67) 22-1004

For large-scale spills (greater than 200 litres) and other significant environmental incidents, the fire services should be contacted as required and the MEFT office informed of the incident (telephone +264 61 284 2111) as well as the MME by completing form PP/11. All correspondence with MEFT/MME should be undertaken by the general manager as guided by the project manager.

3.3 COMPLAINTS HANDLING AND RECORDING

The Proponent shall maintain a complaint's register that will detail the name and contact details of the complainant, the date and time of the complaint, the nature of the complaint, the appropriate action is taken to resolve issues and the date of complaint handover. The Proponent shall be responsible for nominating the correct personnel to coordinate and resolve the issue. Any complaints received verbally shall be recorded as per above and the information shall be given to the Proponent, who is responsible for the management of complaints and will provide a written response to the complainant.

The workforce shall be informed about the complaints register, its location and the person responsible, to refer residents or the general public who wish to lodge a complaint. The complainant shall be informed in writing of the results of the investigation and action to be taken to rectify or address the matter(s). Where no action is taken, the reasons why are to be recorded in the register.

The complaints register shall be kept for the facility and will be available for government or public review upon request.

3.4 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.

3.4.1 SITE INDUCTION

All personnel involved in the Project shall be inducted to the site with a specific environment and social awareness training component. The environment and social awareness training shall ensure that personnel are familiar with the principles of this EMP, the environment and social aspects and impacts associated with their activities, the procedures in place to control these impacts and the consequences of departure from these procedures. The Proponent shall ensure a register of completed training is maintained.

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

- A general site-specific induction that outlines:
  - What is meant by “environment” and “social”;
  - What are the environmental risks and impacts of operations;
  - What can be done to mitigate against such impacts; and
  - Why the environment needs to be protected and conserved.
- The inductee's role and responsibilities concerning implementing the EMP;
- The sites environmental rules;
- Details of how to deal with and who to contact if environmental problems do occur;
- Basic vegetation clearing principles and species ID sheets;
- Focal themes such as compliance, reporting of accidents and incidents, good housekeeping and standard procedures for waste management;
- The potential consequences of non-compliance with this EMP and relevant statutory requirements; and
- The roles of responsible people for the Project.

4 REPORTING, COMPLIANCE AND ENFORCEMENT

4.1 ENVIRONMENTAL INSPECTIONS AND COMPLIANCE MONITORING

4.1.1 SUMMARY OF ENVIRONMENTAL RISKS AND MITIGATION MEASURES

Chapter 5 provides a management plan of environmental impacts and aspects, which identifies mitigation and monitoring measures, as well as roles responsible. This register will be subject to regular review by the project manager and updated when necessary.

The project manager and site manager will use this management plan to undertake monthly inspections (see next section) to ensure the Project is compliant with this EMP.

4.1.2 CONSTRUCTION: ENVIRONMENTAL INSPECTION & COMPLIANCE MONITORING

4.1.2.1 Daily compliance monitoring

A copy of this EMP shall be on-site throughout the Project and shall be available upon request. It is the responsibility of the foreman to enforce the provisions of this EMP and ensure this EMP is complied with by all personnel daily throughout the facility. Daily, weekly and monthly inspections will be undertaken. Any environmental problems or impacts identified shall be notified to the foreman and actioned as soon as is reasonably practicable.

4.1.2.2 Monthly compliance monitoring

Monthly inspections shall be undertaken by the project manager to check that the standards and procedures set out in this EMP are being complied with and pollution control measures are in place and working correctly. 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), the corrective action taken and any necessary follow up measures required.

4.1.3 OPERATIONS: ENVIRONMENTAL INSPECTIONS & COMPLIANCE MONITORING

Annual inspections of the irrigation system, water pipeline and storage facilities (fertilisers and pesticides) will be managed and undertaken by the project manager. All infrastructure will be inspected to ensure plant and equipment are operating as per specification; no damage has been caused, 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 the corrective action taken and any necessary follow up measures required.

4.1.4 REPORTING

There shall be a requirement to ensure that any incident or non-compliance, including any environmental issue, failure of equipment or accident, is reported to the general manager.

4.2 RELEVANT PERMITS

4.2.1 ECOLOGY

Article 23 (b) of the Forest Act, 2001 and associated regulations states that the clearing of vegetation on an area of land greater than 15 hectares will require a permit. This will include the removal of any protected or important species. Permits shall be obtained whenever vegetation is cleared and the Proponent shall undertake all activities in line with the conditions stipulated in the permit.

4.2.2 WATER ABSTRACTION

Although the Water Resources Management Act, No. 11 of 2013 is not enforced, it is best practice to adhere to its stipulations while ensuring compliance with the Water Act, No. 54 of 1956, which is maintained still. Currently, the Proponent uses water from existing boreholes, but will also obtain water from the adjacent Tschudi Copper Mine (utilizing their excess water pumped from the mine pit in the dewatering process), once the mine is back in operation.

The Proponent will apply for a secondary licence to abstract water for commercial use as required in terms of the Water Act, No. 54 of 1956 and shall operate by following any conditions stipulated on the licence.

4.3 NON-COMPLIANCE

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

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

- There is evidence of a contravention of this EMP and associated indicators or objectives;
- The site manager and/or contractor have failed to comply with corrective or other instructions issued by the project manager or qualified authority; or
- The site manager and/or contractor fail to respond to complaints from the public.
- Activities shall be stopped in the event of a serious non-compliant event identified until corrective action (s) has been completed.

4.4 INCIDENT REPORTING

The project manager must ensure that an accident and incident (including minor or near-miss) reporting system is maintained by the foreman so that all applicable statutory requirements are covered. For any serious incident involving a fatality, or permanent disability, the incident scene must be left untouched and cordoned off until witnessed by a representative of the police. This requirement does not preclude immediate first aid being administered and the location being made safe.

The project manager and site 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.

4.4.1 DISCIPLINARY ACTION

This EMP 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(s); and
- 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.

5 ENVIRONMENTAL AND SOCIAL MANAGEMENT

5.1 OBJECTIVES AND TARGETS

Environmental protection is the responsibility of management and if management is environmentally aware, it motivates all employees and their associated business partners, customers and suppliers to think and act in a more environmentally responsible manner. Environmental objectives and targets have been developed so that activities on the proposed site can minimise potential impacts on the environment, as far as reasonably practicable.

Environmental objectives for the Project are as follows:

- Zero pollution incidents;
- Sustainable resource use (water and energy);
- Application of the waste management hierarchy;
- A safe working environment for employees; and
- Use natural resources effectively and efficiently

5.2 MANAGEMENT PLAN OF ENVIRONMENTAL IMPACTS

An environmental review of the proposed Project has been completed to identify all the commitments and agreements made within the environmental scoping report. From this, a schedule of environmental commitments and impacts has been produced (Table 4), which details deliverables including measures identified for the prevention of pollution or damage to the environment during the Project's lifetime.

Table 4 provides a management plan for potential environmental impacts, which identifies mitigation and monitoring measures, as well as the responsible person. This management plan will be subject to regular review by the manager and updated when necessary. The general manager will use this table to undertake monthly inspections to ensure the Project is compliant with this EMP.

Table 4 - Environmental aspects, impacts and mitigation measures

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
Job creation, skills development and business opportunities	Beneficial socio-economic impacts on a local and regional scale	– Maximise local employment and local business opportunities; – Enhance the use of local labour and local skills as far as reasonably possible; and – Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.	Monthly	General manager/Proponent
General construction and operational activities	– Odours – Safety – Aerial emissions – Potential loss of oil and fuel causing ground contamination	– Plant and equipment shall be brought onto the site as and when required and stored in specific areas; – Amenities (e.g. portable toilets) shall be provided and set up in a suitable location (if required); – A 'good housekeeping' policy shall be adopted across the farm portions especially with regards to surface infrastructure (sheds, buildings etc.); and – Refuelling of the mobile plant shall be undertaken in a designated area.	Daily	Project manager
	Dust generation	– Use existing access roads and tracks; – Dust suppression using water may be necessary where the ground is to be left fallow during a dry period or where dust generation is profound; – Use of mixed crops, including trees to minimise wind-blown erosion. – Restricted speeds (<30km/hr); and	Daily	Project manager

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Provide protective masks and eyeglasses to employees in dusty working environments.		
	Noise generation	Noise shall be minimised as much as possible during pipeline construction works. The following measures shall be applied: – Limit normal operating hours to 07h00 to 18h00 on weekdays and 07h00 until 13h00 on Saturday; – Regular maintenance and servicing of vehicles, plant and equipment; and – All equipment is to be shut down or throttled back between periods of use.	Daily	Project manager
	Fire management	– Development of a fire management system through the process of risk identification and assessment; – Developing site-specific work procedures as part of the fire management system; – Induction on fire prevention and toolbox talks; – Control and reduce the potential risk of fire by segregating and safe storage of flammable materials; – Avoid potential sources of ignition for example, by prohibiting smoking in and around areas where chemicals/fuel is stored;	Daily	Employees

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Ensure suitable fire-extinguishing equipment is accessed immediately and conveniently whenever necessary. This can include pails of water, buckets of sand, or portable extinguishers; – For field fires, appropriate fire fighting equipment should be available on-site; – Emergency contact details should be readily available on-site; – Ensure key personnel are trained to manage an emergency fire situation.		
Vegetation	– Alien species	– Ensure the correct removal of alien invasive vegetation from the farm portions and prevent the establishment and spread of alien invasive plants due to the operational activities; – Ensure the potential introduction and spread of alien plants is prevented; and – All Project or earth moving equipment must have an internal weed and seed inspection completed prior to equipment being used on site.	Monitor daily the removal of the alien invasive vegetation. Check the tyre of vehicles after use on-site.	Project manager

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
	– Removal of vegetation – Loss of flora and fauna, protected/important species – Dust generation	– Use existing tracks where possible; – Identify and mark important tree species and clearly highlight them to construction workers so that they are avoided; – Apply speed restrictions; – Avoid off-road driving; – Access tracks should be wider than normal to accommodate equipment; and – Apply speed restrictions.	Daily visual inspection during construction of new access tracks/widening	Employees
Biodiversity encounters	The possible encountering of wildlife on-site	The Nature Conservation Ordinance Act No. 4 of 1975 and its regulations, Controlled Wildlife Products and Trade Act 9 of 2008 and the Animals Protection Act 71 of 1962 should be closely followed with regards to any encounters with wildlife within farm boundaries. – No living organism should be removed from the site by anyone other than by a professional/registered animal handler, pest control company, SPCA, MEFT/MAWLR or relevant rehabilitation or wildlife organisations;	Daily, weekly	Employees

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– No living organism shall be poached/consumed/harmed or killed for illegal purposes (i.e., illicit trade of pangolins for scales); – Police and MEFT should be notified of any poaching incident involving sensitive or protected species or if such an animal is found on someone within or surrounding farm boundary; – If snares or poaching equipment is found in the field it should be removed and destroyed; – Fences and farms should be monitored for potential snares and traps; – Wildlife encountered on farm should be ethically treated; – Nests discovered on infrastructure within farm boundaries should not be removed or destroyed if it is not clear that there are no eggs or chicks in the nests; – Nests/eggs/birds should be identified by a professional and action could be taken depending on advice or instruction given by the professional; – Pesticides and herbicides should not be used as far as reasonably possible;		

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– If there is no other possibility the relevant pesticides/herbicides/chemicals should be used by a professional/registered pest control company and the MSDS of the substance used should be closely followed; – Invasive plant species should be removed and their spread should be prevented; and – Waste on-site should be well managed and removed from the site to prevent animals (i.e. rodents, snakes, scorpions etc) from breeding/living on-site.		
Biodiversity	Construction and installation of the pipeline infrastructure	– Holes excavated for the pipelines should be covered during the night or during periods of no construction. – Construction vehicles should not drive into the field; – Construction vehicles should be on the lookout for slow-moving animals to avoid killing or harming them; – Vehicles should stay on the existing roads as far as possible; and – Prevent the killing of perceived dangerous species (e.g., snakes); collection of veld foods (e.g., giant bullfrog, tortoise, monitor lizard); any form of poaching (e.g., setting of snares for birds and ungulates, etc.).	Daily	Contractor/Project manager

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
Site and Ground Preparation	Potential soil disruption	– Specific activities that may generate dust shall be avoided during high wind events, e.g. soil preparation activities; and – Use of mixed crops, including trees to minimise wind-blown erosion.	Daily	Project manager
Land management	Reduced soil quality (loss of nutrients, use of chemicals)	– Ensure land is suitably prepared before planting crops. This may involve the application of fertilisers; – Fertilisers to be applied by following material safety data sheet (MSDS) guidelines for safe application methods and prescribed limits; – Ensure land is suitably prepared before planting crops. – Plant crops suitable to the soil quality, climate and needs as per the Agriculture Study (Smith, 2015) *The Agricultural Potential of !Uris)*; – Apply fertilisers as required and by following legal and safety requirements; – Minimise use of pesticides and insecticides and implement sustainable integrated pest management through the use of physical, chemical, biological and cultural controls;	Daily	Project Manager

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Minimise surface runoff during rainfall events through suitable ground management measures such as diversion channels around the field that must be able to deliver the runoff to a stable outlet; – Minimise surface runoff by using any readily available mulching materials e.g straw, grass clippings and wood chips (www.fao.org, n.d.); and – Avoid leaving bare earth for long durations and consider the use of shelterbelts or cover crops during high wind.		
Operating plant and equipment during pipeline construction phase	– Dust generation – Increase in noise levels	– Normal working hours should be restricted between 07:00-18:00 during the week and 07:00-13:00 on Saturdays. No construction work may be conducted on Sundays; – Regular maintenance of plant, equipment and machinery; – Spilled oil should be treated as hazardous waste; and – Drip trays for trucks to avoid oil leakages and to be used when refuelling.	Daily, weekly	Project Manager Employees (equipment operators)
Harvesting activities	Potential re-establishment of alien plants on site	– Ensure the correct removal of alien invasive vegetation from the proposed Project area and prevent the establishment and spread of alien invasive plants; and	Weekly	Project Manager

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Ensure compliance with relevant environmental specifications for the control and removal of alien invasive plant species.		
Resource use	Inefficient use of water	– Regularly manage crops, crop areas and irrigation systems to avoid applying water to unplanted areas or applying irrigation when not needed; – Using appropriate irrigation rates and scheduling; – Design the irrigation system for improved irrigation, uniformity and efficiency to reduce runoff and leaching; – Regularly maintain the irrigation system so that it continues to operate efficiently; and – The irrigation method will ensure that maximum water uptake through plant absorption is as effective as possible to ensure minimal water loss through inefficient irrigation processes.	Check irrigation infrastructure weekly	Project Manager
Use of fertilisers and pesticides	– Ground contamination – Ecological effects	– All necessary approvals are in place before bringing fuel, oil or chemicals onto the site; – Fertilisers and pesticides shall be applied if and where necessary and shall be done according to regulations or application instructions; – The use of chemical pesticides shall be avoided and minimized (quantity and frequency);	Daily observations when fertilisers and pesticides are applied	Project Manager

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Biological Control Agents (BCA) shall not be used; o Arbouricides shall not be sprayed and use shall be avoided where possible; – Monitor areas where chemicals are used. If there is environmental degradation, cease the use of chemicals and liaise with the environmental manager; – Store fuels or chemicals away from surface or groundwater areas; – All chemicals shall be labelled with the correct contents and safety, hazards or handling instructions; – An inventory of chemicals shall be maintained (Chemical Register to be kept); – All primary containers shall be fit for purpose and should not be damaged; – All chemicals should be stored in an area with a contained impermeable surface; – Ensure the storage area is lockable and kept clean and organised; – Locate storage away from surface water and groundwate areasr; – Have spill kits available where chemicals are stored and used; – Ensure chemicals are not exposed to heat; and	Weekly observations to identify any impacts from the use of fertilisers and pesticides.	

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Storage of fertilisers and fuels together is prohibited.		
Heritage	Potential heritage discovery	When uncovering archaeological remains the following measures (chance find procedure) shall be applied: – Works to cease, area to be demarcated with appropriate tape by the site supervisor and the Site Manager to be informed; – Site Manager to visit the site and determine whether work can proceed without damage to findings, mark exclusions boundary and inform the Project Manager with the GPS position if possible; and – If works cannot proceed without damage to findings, the site manager to inform the Project Manager who will get in touch with an archaeologist who will provide advice.	Daily	Project Manager
Emergency Incidents	Soil and water contamination due to inadequate control or accidental release of hazardous substances on site	**Safe handling of fuel on-site** **Storage** – Separate hazardous and non-hazardous chemicals from each other; – Label chemicals appropriately; – Chemicals with different hazard symbols should not be stored together - clear guidance on the compatibility of	Daily	All staff members

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		different chemicals can be obtained from the Materials Safety Data Sheets (MSDS) which should be readily available; – Store chemicals in a dedicated, enclosed and secure facility with a roof and a paved/concrete floor with a bund; – Diesel tanks should be completely contained within secondary containment such as bunding; – Consider the feasibility of substituting hazardous chemicals with less hazardous alternatives; and – 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. **Spills** Spill kits with the following items as a minimum should be made available on site: – Absorbent materials; – Shovels; – Heavy-duty plastic bags; – Protective clothing (e.g., gloves and overalls); and		

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Major servicing of equipment shall be undertaken offsite or within appropriately equipped workshops. **Servicing** – 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); – Provision of adequate and frequent training on spill management, spill response and refuelling must be provided to all onsite staff; – No refuelling is to take place within 50 meters of groundwater boreholes, surface water bodies or streams; – Vehicles and machinery are to be regularly serviced to minimise oil and fuel leaks; and – All major petroleum product spills (spill of more than 200 litres per spill) should be reported to the Ministry of Mines and Energy (MME) on Form PP/11 titled "Reporting of major petroleum product spill'.		

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		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; and – Isolate the area as required. **The following measures are to be implemented in response to a spill:** – Spills are to be stopped at the source as soon as possible (e.g., close valve or upright drum); – Spilled material is to be contained to the smallest area possible using a combination of absorbent material, earthen bunds or other containment methods; – Spilled 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;		

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– All contaminated materials recovered after a spill, including soils, absorbent pads and sawdust, are to be disposed of at an appropriately licenced facility for hazardous waste; – A written incident report must be submitted to the general manager.		
Soil disturbances	Potential soil erosion during heavy precipitation or strong winds within farm boundaries at cleared areas	– Indigenous vegetation could be planted to prevent erosion; – Rock beds could also be used to prevent erosion on the gentle slopes around the buildings; and – An erosion control plan could be developed and implemented on-site at areas with steeper slopes.	Monthly	Project manager/Proponent
	Construction and installation of the pipelines	– Holes excavated for the pipelines should preferably be as narrow as possible to avoid unnecessary soil disturbances; – Construction vehicles should stay on existing roads as far as possible to prevent soil compaction in the field; – Vehicles should not drive in the field in wet conditions; and – Pipelines should be effectively buried with the soil excavated and as far as possible represent the ground surface before escavation.	Daily	Contractor/ Project manager

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
Waste management	– Nuisances – Land use – Burning of waste (air pollution)	– Training and Toolbox Talks; – Good housekeeping across the site; – All working areas shall apply good housekeeping; – Implement the waste management hierarchy across the site: Avoid, reuse, recycle and then dispose of; – Waste shall be collected from all harvesting areas and brought to a dedicated central waste collection area where it shall be separated. The dedicated central waste area shall be fenced to prevent spreading into the environment and people and animals entering; – Waste storage areas shall be kept clean and tidy at all times; – Waste shall be removed regularly to avoid pests and bad odours; – Only combustible waste shall be burnt. Hazardous waste shall not be burnt; – If required, waste to be burnt shall be dry to reduce the amount of smoke and increase the combustion rate; – Water buckets or other fire control / extinguish methods shall be at the fire pit;	Daily and weekly	Project Manager Employees

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Burning takes place only on days when winds are light and blowing away from people; – Waste is burned in manageable volumes, so the fire does not get out of control; – The fire is started, attended and monitored at all times by authorized and qualified personnel. Employees undertaking burning activities shall remain at a safe distance upwind of the fire; – It is unlikely that hazardous material and wastes will be produced, however, if they do, they shall be managed safely and responsibly to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials; and – Hazardous and non-hazardous waste shall be stored separately at all times.		
	Environmental pollution (littering and poor storage of solid waste)	– Waste management should be handled by following the International Finance Corporation (IFC) standards as follows: – Implement a waste management plan (from “cradle to grave” methodology) covering all aspects of waste generated on-site;	Daily/Weekly	Project Manager Employees

Task activity/ equipment	Impact identified	Mitigation control measures	Monitoring requirements	Responsibility
		– Solid waste shall be stored in an appointed area in covered, tip-proof metal drums/skips for collection and disposal to an approved waste management site; – The waste storage areas shall always be kept clean and tidy; – Storage of domestic waste on site may result in the attraction of unwanted scavengers and should be removed as soon as it is feasible; – Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty bags for reuse; – Solid wastes should be deposited/emptied regularly. – See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers; – Liaise with the governing body (municipality/council) regarding the waste and handling of hazardous waste; – Hydrocarbon and chemical contaminated solids have the potential to cause contamination to the soil, ground and or surface water, thus correct storage and disposal methods are required.		

6 DECOMMISSIONING

Due to the continuous and expected long term duration of the Project uncertainties that exist at this stage for the decommissioning and reinstatement strategy, the following is assumed and recommended:

- The irrigation infrastructure shall be removed and disposed of by following the existing waste management arrangements on site.
- The water pipeline shall either be removed and disposed of in line with the existing waste management arrangements on-site, or shall remain in-situ, and the concrete pipeline shall be broken to avoid hollow spaces and allow material to fill and ground around the disused pipeline.
- The above works shall apply the principles set out in this EMP, which shall be updated with any specific decommissioning or reinstatement activities or noticeable changes from this report, before undertaking the decommissioning works.

7 IMPLEMENTATION OF THE EMP

The proposed irrigation and pipeline construction work will be carried out in compliance with the relevant regulations. Minor to moderate significant impacts are anticipated for the impacts that have been identified and management and mitigation measures are in place for potential risks; which, are also there to eliminate or reduce the severity of potential impacts.

This EMP:

A. Has been prepared according to a contract with the Proponent;
B. Has been prepared based on information provided to ECC up to November 2021;
C. Is for the sole use of the Proponent, for the sole purpose of an EMP;
D. Must not be used (1) by any person other than the Proponent or (2) for a purpose other than an EMP; and
E. Must not be copied without the prior written permission of ECC.

ECC has prepared the EMP based on information provided by the Proponent, and the environmental scoping report conducted for Three Musketeers Investments (Pty) Ltd and the proposed irrigation Project.