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ESMP REPORT:

IRRIGATION SYSTEM FOR AN AGRICULTURE PROJECT ON FARM GAI KAISA NO. 159, OTJOZONDJUPA REGION, NAMIBIA

PROJECT NUMBER: ECC-118-579-REP-05-D

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ABBREVIATIONS

Abbreviation	Description
%	percentage
BCA	biological control agents
dB	decibel
DWA	Department of Water Affairs
ECC	Environmental Compliance Consultancy (Pty) Ltd
e.g.	example
EMA	Environmental Management Act, No. 7 of 2007
ESIA	environmental and social impact assessment
ESMP	environmental and social management plan
GIS	geographic information system
GPS	global positioning system
ha	hectares
HR	Human Resources
km	kilometre
km/h	kilometre per hour
kV	kilovolt
Ltd.	limited
m	metre
m^3	cubic metre
Mm^3/a	million cubic metre of water per annum
MAFWLR	Ministry of Agriculture, Fisheries, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism

Abbreviation	Description
MLIREC	Ministry of Labour, Industrial Relation and Employment Creation
MSDS	material safety data sheet
NHC	National Heritage Council
No.	number
OHSE	occupational health, safety and environmental
PPE	personnel protective equipment
Pty	proprietary
Reg	registration
Retort Charcoal	Retort Charcoal Producers (Pty) Ltd
SE	southeast

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Environmental Compliance Consultancy (Pty) Ltd (ECC) has been engaged by Retort Charcoal Producers (Pty) Ltd (hereinafter referred to as Retort Charcoal or "the Proponent") to prepare this environmental and social management plan (ESMP) for the irrigation system for an Agriculture Production Project on Farm Gai Kaisa No. 159. The Project site is located approximately 30 km southeast (SE) of the Kombat settlement and approximately 42 km southwest (SW) of Grootfontein town and can be accessed via the D2804 district road that branches out from the B8 main road in the Otjozondjupa Region (Figure 1).

The Proponent proposes the operation of an irrigation project to support crop production. Irrigation is planned to be implemented in two (2) phases, each comprising approximately 135 hectares (ha) of cultivated area consisting of maize and fodder. Phase 1 will require an estimated one (1) million cubic metre of water per annum (Mm^3/a). Phase 2 expands the total cultivated area to approximately 260 ha, resulting in a total groundwater requirement of approximately two (2) Mm^3/a. Furthermore, four (4) ha will be set aside for the cultivation of perennial crops (fruit trees, grapes, pecans and avocado) on farm Gai Kaisa No. 159.

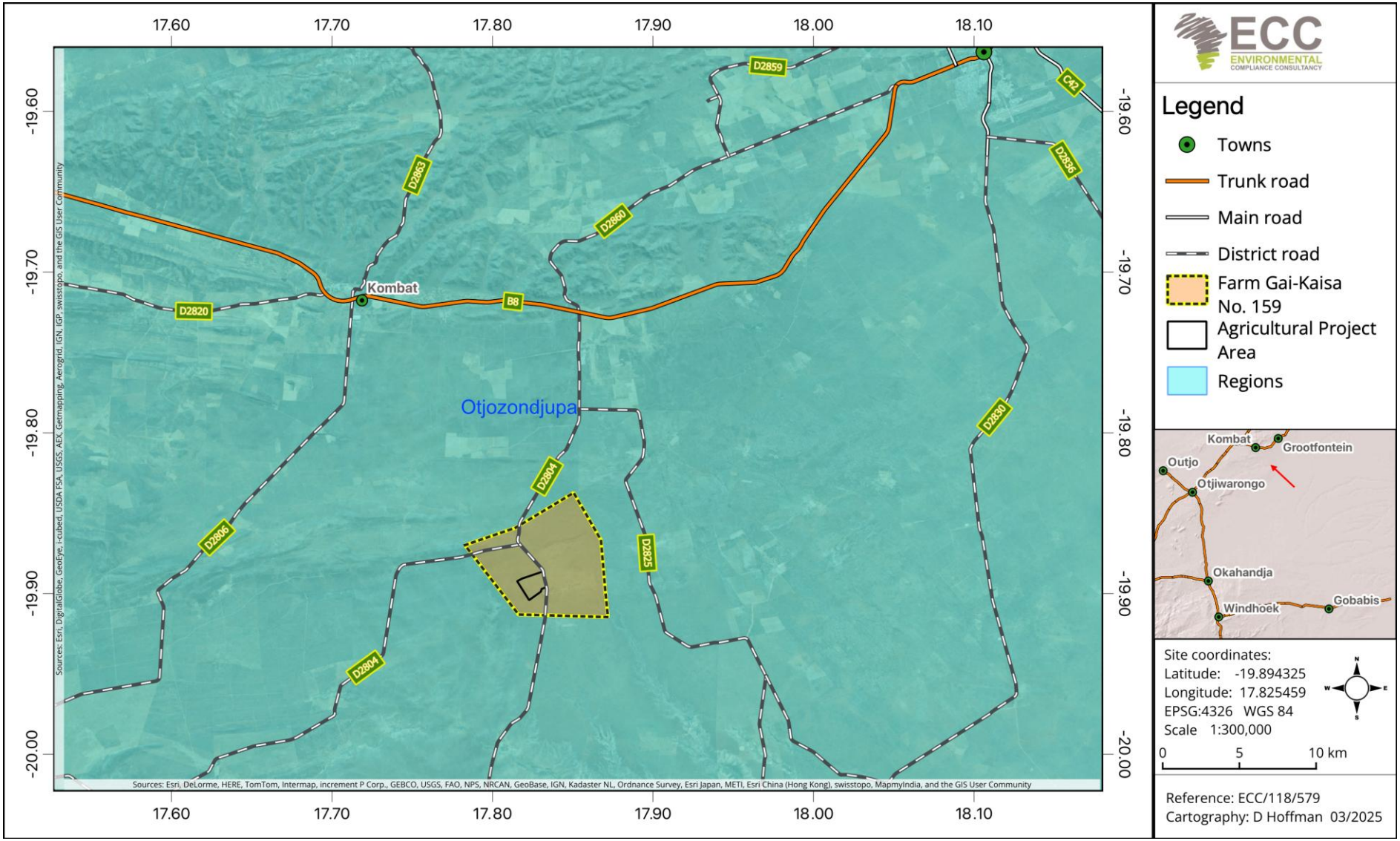

Figure 1 - Locality map of the proposed Project

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 (EMA) and its Regulations, promulgated in 2012. An environmental scoping report, plus impact assessment and environmental and social 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 ESMP has been developed in terms of the requirements of the EMA and its 2012 Regulations.

1.3 PURPOSE AND SCOPE OF THIS REPORT

This ESMP provides a logical framework, mitigation measures and management strategies for the activities associated with the proposed Project. In this way ensuring that the potential environmental 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 plus impact assessment report and is based on the findings of the assessments carried out to date. The environmental scoping plus impact assessment report should be referred to for further information on the proposed Project, assessment methodology, applicable legislation and impact assessment findings.

This ESMP is a live document and shall be reviewed at predetermined intervals, and or updated during the environmental and social impact assessment (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 Ministry of Environment, Forestry and Tourism (MEFT).

1.4 MANAGEMENT OF THIS ESMP

Retort Charcoal Producers (Pty) Ltd, the Proponent, will hold the environmental clearance certificate for the proposed Project and will be responsible for the implementation and management of this ESMP. 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.

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 is based on the Project description as provided in the scoping plus impact assessment. Where the design or operation method is 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.

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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 Project 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 waste generation;
- Sustainable resource use (water and energy);
- Minimal interruption to water supply of neighbouring farmers; and
- A safe working environment for employees.

2.2 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 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 (when engaged for maintenance or repair work) 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; – Responsible for providing the resources required to effectively run operations and comply with the ESMP; – Appoint all managers and supervisors needed to ensure effective running of operations; and

Role	Responsibilities and duties
	– Ensure systems for proper induction and training of personnel and contractors are in place.
Project manager	– Responsible for ensuring compliance with this ESMP; – Ensuring employees understand and comply with the requirements of this ESMP; – Ensuring that all personnel are provided with adequate training, supervision and instruction to fulfil this requirement; – Ensuring compliance with this ESMP including overseeing the day-to-day activities during operations, routine and non-routine maintenance work during operations; – Ensure the environmental policy is communicated to all personnel; – Responsible for providing the required resources (including financial and technical) to complete any required tasks; – Responsible for the management, maintenance and revisions of this ESMP; – Maintain community issues and concerns register and keep records of complaints; – Ensuring that best environmental practice is undertaken throughout the Project lifecycle; – Notifying relevant regulatory authorities if serious environmental incidents occur as soon as possible; – Being responsible for all management plans and environmental monitoring; and – Receiving and responding to environment-related complaints received from the public or other stakeholders.
Foreman/Health, safety and environmental (HSE) representative	The Proponent shall appoint a foreman or HSE representative who will be responsible for the implementation of the health, safety and environmental requirements of the ESMP. The appointed professional will be available, as required, throughout the irrigation operations and is responsible for the following roles: – Bearing authority and independence to demand reasonable steps as required to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant activities be ceased immediately should an adverse impact on the environment be likely to occur; – Weekly checklist must be completed by the foreman/HSE representative and findings submitted to the general manager; – Monthly ESMP checklists must be completed by the foreman/HSE representative. Findings are to be submitted to the Project/farm manager in a timely manner;

Role	Responsibilities and duties
	– Provisioning of environmental awareness/management; – Ensuring that best environmental practices are undertaken throughout the operations of the Project; – Timely distribution of any relevant environmental documentation, including revisions to this ESMP to all staff; – Responsible for being compliant with and adhering to this ESMP at all times; – Monitoring of the site and enforcing health and hygiene measures; – Ensuring employees and contractors are conversant with the requirements of this ESMP; and – Reporting of any operations and conditions that deviate from the ESMP or any non-compliant issues or accidents to the Proponent.
Employees/contractor employees	– Responsible for being compliant with this ESMP throughout operations, in addition to: – Ensuring that they are conversant with the requirements of this ESMP; – Ensuring appropriate briefings for certain activities have been provided and fully understood; – Adherence to this ESMP at all times; and – Reporting of any operations and conditions that deviate from the ESMP or any non-compliant issues or accidents to the foreman/HSE representative; – Undertake any corrective actions to ensure that non-compliances are timely and adequately addressed.

2.3 CONTRACTORS

Any contractors hired during operations for repair or maintenance activities 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 or impacts to the Project/farm manager; and
- Ensuring appropriate corrective or remedial action(s) are taken to address all environmental aspects, potential impacts 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's 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, where they have the prerequisite skills and experience, 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;
- Should foreign workers be hired, the Proponent shall ensure that they have valid work permits at all times; and
- Every effort shall be made to recruit from the group of unemployed workers living in the surrounding area for positions that entail unskilled work.

3 COMMUNICATION AND AWARENESS

To ensure that potential aspects 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 communication is maintained with stakeholders and regulatory authorities (i.e. surrounding community, farmers/landowners, MEFT, Ministry of Agriculture, Fisheries, Water and Land Reform (MAFWLR)) and are informed of the potential impacts and how to minimise or avoid them. This section outlines the framework for communication related to the implementation of the commitments that are specified in this ESMP.

3.1 INTERNAL COMMUNICATIONS

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

- Site notices;
- WhatsApp group (or preferred social communication mobile application tool);
- Daily, weekly and monthly audits and site inspections;
- Instructions on incident response procedures; and
- Briefing on key Project-specific social and environmental issues.

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

During operations, 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.

3.1.1 SITE INSPECTION AND TOOLBOX TALKS

The workforce must be briefed on the observations recorded during the site inspection and risk assessment findings during toolbox talks. The workforce must demonstrate an understanding of the principles outlined in this ESMP and the potential environmental and social impacts associated with their activities. All Project personnel must also demonstrate a clear understanding of the procedures required to control these impacts and the consequences of departure from these procedures.

All Project personnel must demonstrate an understanding of the following:

- Demonstrate an understanding of the site's environmental rules and the broader regulations established by MEFT and MAFWLR;
- Understand the necessary steps to address any environmental issues and identify the appropriate contacts for resolving such problems;

- Understand the potential consequences of non-compliance with this ESMP and violation of relevant statutory licences and permits conditions; and
- The roles of responsible people working on the Project.

3.1.2 TRAINING AND ENVIRONMENTAL AWARENESS

All personnel working on the Project must be competent to perform tasks that have the potential to cause an environmental impact. Competence is defined in terms of appropriate education, training and work experience. When it has been determined that certain skills are lacking, training and refresher courses must be offered to the workforce. The Project manager and Site supervisor(s) must ensure records of these training sessions are always kept onsite and filed.

3.2 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. Table 2 contains a list of numbers to be contacted in case of an emergency.

Table 2 - Emergency contact details

Town	Ambulance	Police	Fire brigade
Kombat	+264 (67) 23-1000	+264 (67) 1-0111	+264 (67) 23-1000

For large-scale spills and other significant environmental incidents, the fire services should be contacted as required and the office of the MEFT informed of the incident (telephone +264 61 284 2111).

For the clean-up of small 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.

3.3 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/farm manager, who is overall responsible for the management of complaints. The Proponent must address the complaints by following these measures:

- Record the complaint in the complaints register; and
- Provide a written response to the complainant 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 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 REPORTING, COMPLIANCE AND ENFORCEMENT

4.1 ENVIRONMENTAL PERFORMANCE MANAGEMENT

This section outlines the overall monitoring commitments required for implementation during the Project operations. It details procedures to ensure routine inspections and audits are conducted to ensure that Project's activities are aligned and remain compliant with this ESMP.

4.2 AGRICULTURE OPERATIONAL PHASE: ENVIRONMENTAL INSPECTIONS AND COMPLIANCE

4.2.1 DAILY AND WEEKLY COMPLIANCE MONITORING

A copy of this ESMP will be on-site throughout the Project and will be available upon request. It is the responsibility of the Project manager to ensure this ESMP is complied with through their daily roles. Daily inspections will be undertaken by the Foreman/HSE representative (or nominated site supervisor). Any environmental aspects or impacts identified will be reported to the Project/farm manager and actioned as soon as is reasonably practicable.

4.2.2 MONTHLY COMPLIANCE MONITORING

Monthly inspections will be undertaken by the foreman/HSE representative to check that the standards and procedures set out in this ESMP are being complied with and environmental control measures are in place and working correctly. Bi-annual inspection should be conducted throughout the Project lifecycle to ensure that the water used on a bi-annual basis is reported and that equipment is operating as per specification. Additionally, any reporting requirements outlined in the water abstraction and water use license must also be adhered to. Any non-conformance will 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.

4.3 REPORTING

There will be a requirement to ensure that any incident or non-compliance, including any environmental issue, failure of equipment or accident, is reported to the Project manager. The MEFT reserves the right to require the Proponent to submit bi-annual reports evaluating the Project's compliance with the commitments that are outlined in this ESMP.

If significant environmental spills (hydrocarbons) occur close or in a water source, the Department of Water Affairs (DWA) is to be notified. All correspondence with the relevant

ministries should be by the Proponent/Project manager. Notification should occur no later than forty-eight (48) hours after the incident has occurred.

Occupational incidents and accidents incurred on site should be reported to the authorities (i.e. Occupational Safety & Health Department) at the Ministry of Labour, Industrial Relation and Employment Creation (MLIREC), by using form F.5.

In case of archaeological objects or heritage artefacts discovered on-site, the chance find procedure must be followed and the National Heritage Council (NHC) must be informed by the Proponent/Project manager (Appendix A).

All correspondence and communication with local and regulatory authorities should be undertaken by the Exploration manager.

4.3.1 NON-COMPLIANCE

Where it has been identified that activities are not compliant with this ESMP, the Proponent must ensure that corrective actions are implemented to the extent that the activities 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 will be produced. The notice will be generated during inspections. Follow ups must be conducted to determine whether the corrective actions are implemented as planned and instructed.

A non-compliance event / situation is considered if:

- There is evidence of contravention of this ESMP and associated indicators or objectives;
- The contractors or subcontractors have failed to comply with corrective actions or other instructions issued to them or qualified authority; or
- There is evidence of negligence in recording, investigating and responding to community complaints through the established reporting channels and grievance resolution mechanisms.

Depending on severity, work will be stopped in the event of a non-compliance, until corrective action(s) has been completed. The non-compliance will be closed out once the Proponent has inspected the corrective action and confirmed that the issue has been satisfactorily resolved.

4.3.2 DISCIPLINARY ACTION

This ESMP is a legally binding document and non-compliance with its provisions may result in disciplinary action(s) being taken against the perpetrator/s. These actions may include, but not limited to the following:

- Legal actions in accordance with other applicable environmental and labour laws;
- Imposition of monetary fines or penalties on contractors or subcontractors;

- Termination of contractual agreements with contractors, subcontractors or suppliers;
- Requirement for immediate corrective or remedial actions at violator's expense;
- Suspension or withdrawal of the Project approved licences and permits;
- Complete or partial suspension of Project activities until compliance is restored; or
- Disqualification from participating in future Project activities.

5 ENVIRONMENTAL AND SOCIAL MANAGEMENT

5.1 ENVIRONMENTAL PERFORMANCE MANAGEMENT

5.1.1 TABLE 3 AND DECOMMISSIONING PHASE

The decommissioning phase follows the operational phase. This section provides a site-specific plan developed to ensure that appropriate environmental and management practices are followed during the decommissioning phase. The section also outlines detailed remediation; site control and monitoring activities that will be conducted once irrigation infrastructure is no longer required.

The decommissioning phase:

- Provide effective and implementable site-specific procedures and mitigation measures to monitor and manage environmental impacts throughout the decommissioning phase. These measures aim to minimise the likelihood and extent of post decommissioning impacts;
- Establish a long-term management plan for the Project site to ensure its effective transition to its next intended use;
- Aims to eliminate the long-term liability issues and reduce the likely occurrence of irreversible impacts post site closure; and
- Provide a platform for the Proponent to engage/collaborate with local communities, stakeholders and regulatory authorities in the planning and implementation of decommissioning activities, including the disposal of waste, irrigation remnants and post closure care requirements.

The decommission phase or site closure is yet to be determined. However, should this be required or determined for any reason, the following general conditions outlined in Table 4 shall be followed and implemented, as best practice measures.

Table 4 provides the overall management plan of potential impacts of the Project during operational and decommissioning phase. The plan provides mitigation and monitoring commitments, as well as the roles responsible for execution. The Proponent and Project manager will use the environmental management plan to undertake daily, weekly and monthly inspections to ensure the Project remain compliant with this ESMP during the operational and decommissioning phases.

This ESMP has been developed to provide a clear guidance to Project personnel and appointed contractors throughout the operational and decommissioning phases. Specifically, it covers:

- **Operational phase:** the day-to-day management of irrigation processes and associated activities, including any required mechanical or maintenance work; and
- **Decommissioning phase:** the systematic cessation of Project operations, including the implementation of appropriate after-care measures.

This ESMP has been developed to provide guidance to employees, contractors and subcontractors through the operational and decommissioning phase.

5.1.2 OPERATIONAL PHASE

This section outlines the management, mitigation and monitoring measures to be implemented during the daily operation and management of the Project. All operational activities should be guided by the following principles:

- To manage Project operations and associated activities in ways that minimise disturbance to the surrounding biophysical environment and social receptors;
- To encourage and enforce environmentally responsible behaviours amongst Project personnel;
- To prioritise the conservation of the natural environment by integrating sustainable practices into all aspects of Project operations;
- To foster partnership with community stakeholders and regulatory authorities in joint management of water resources; and
- To actively collaborate with regulatory authorities (i.e. DWA and MEFT) by maintaining open communication and ensuring compliance with all Project approved licences and certificates.

The specific environmental management measures and monitoring requirements required for implementation during the operational phase are discussed in Table 3.

Table 3 – Environmental aspects, management, mitigation and monitoring measures for the operational phase

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
Access and site activities	– Conflict with neighbours/landowners.	– Use existing roads for access to avoid new tracks and create cut lines with due regard to existing land use activities in the area; – Ensure appropriate supervision of all activities; – Maintain continuous engagement with neighbours/landowners to identify any concerns or issues, appropriate mitigation and management measures agreed upon; – Maintain a compliant register. Complaints received must be addressed through established grievance resolutions; and – Accidents and incidents need to be reported to the Project manager and recorded in an incident register.	– Occupational health, safety and environment (OHSE) audits and inspections – Daily	– Project manager – Contractors – Employees
Socio-economic	– Job creation for locals.	– Maximise local employment; – Enhance the use of local labour and local skills as far as reasonably possible; and – Endeavour to source goods and services from the local and regional economy, as far as reasonably practicable.	– Human Resources (HR) recruitment policies and procedures	– HR manager
Training and awareness	– Lack of environmental knowledge on ESMP	– A site-specific induction is required for all staff and contractors who will work and will be made aware of specific conditions per landowner	– Environmental audits and inspections	– Project Manager – HSE appointed person/ foremen and

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
	requirements lead to environmental incidents.	requirements; – Awareness will be distributed by various channels as deemed appropriate; – Provide task-specific training on safe operation, start-up, shut-down, and emergency procedures; – Train workers in correct lifting and manual handling techniques for pipes, emitters, filters, and fittings; and – Notice/awareness boards to be kept up to date with the latest information shared.		Supervisors
Occupational health and safety	– Injuries or fatalities sustained on-site.	– The Proponent shall ensure that occupational health and safety requirements are incorporated into the bidding and tendering processes to guarantee that all contractors and subcontractors comply with these standards; – Contractors and subcontractors should comply with all safety requirements outlined in the contracts signed with the Proponent; – Conduct induction training for all personnel prior to commencing work, covering hazards, emergency procedures and safe work practices; – Ensure all centre pivot systems, pumps, motors, and control panels are installed and commissioned by qualified personnel;	– Daily – Weekly – Monthly	– Project Manager – Foreman – Contractors – Subcontractors

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		– Maintain a clear chain of communication and incident-reporting procedure; – Provide fire extinguishers at designated areas (fuel storage areas, camps and near generators) and first aid kits; – Provide hearing protection where noise levels exceed acceptable limits; – Conduct regular emergency drills (fire, evacuation and spill response); – Provide shaded rest areas and access to safe potable drinking water; and – Workers should work hours as stipulated in their contract to prevent symptoms of heat exhaustion and heat stroke.		
Visual	– Visual disturbances.	– Where feasible, avoid locating irrigation infrastructure on elevated or visually prominent areas; – Avoid highly reflective or brightly coloured materials that may increase visual contrast with the surrounding landscape; – Maintain existing natural vegetation where possible to provide visual screening; – Where lighting is required for safety, use downward-directed, low-intensity lighting to	– Daily observations	– Project Manager – Foreman – Supervisor(s) – Employees

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		reduce night-time visual intrusion; – Restrict speed of vehicles (<40 km/h) to avoid excessive dust generation; – Maintain irrigation infrastructure in good working order to prevent visual deterioration such as rusting, sagging pipelines, or damaged pivot components; and – Remove obsolete or redundant irrigation equipment from site.		
Air quality	– Increased dust levels.	– All vehicles and machinery / equipment to be shut down or throttled back between periods of use; – Ensure pumps, generators, and vehicles are regularly serviced and maintained to minimise exhaust emissions; – Use existing access roads and tracks where possible; – Apply dust suppression where possible; – Cover of all vehicles transporting loose materials; – Restrict speed of vehicles (<40 km/h); – Maintain soil moisture through appropriate irrigation scheduling to reduce wind-blown dust from cultivated areas; – Apply fertilisers and agrochemicals in accordance	– Daily inspections – Dust fallout monitoring	– Foreman – Supervisor(s) – Employees

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		with manufacturer recommendations and best practice to minimise volatilisation and spray drift; – Avoid chemical application during high wind conditions; – Ensure containers are kept closed when not in use to prevent vapour release; and – Clean up spills promptly to avoid odours and emissions.		
Noise	– Irrigation and other Project activities related noise pollution.	– Avoid noise generating activities (e.g. avoid non-essential maintenance at night); – Work activities shall be planned and scheduled to prevent disturbance during nighttime hours (19:00–05:00); – Procedures for receiving complaints from nearby land users or residents to be in place; – A complaints register must be kept. Complaints received should be addressed as per complaint handling procedures; – Maintain pumps and motors to minimise excessive noise and vibration; – Select low-noise pumps, motors, and generators where practicable and ensure equipment is fitted with silencers or acoustic enclosures; – Locate pump stations, generators, and control	– Daily – Weekly – Monthly	– Project Manager – Foreman – Contractors – Subcontractors

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		infrastructure as far as practicable from noise-sensitive receptors, i.e., neighbours; – Maintain all mechanical equipment regularly to prevent excessive noise caused by wear, vibration, or malfunction; and – Limit unnecessary idling of vehicles and machinery.		
Resource use	– Inefficient use of water resources.	– Obtain water abstraction licences from DWA for all abstraction before operational activities commence; – If new boreholes are required to be drilled, borehole drilling licence applications for identified boreholes are to be submitted, prior to the abstraction licence application; – Record volumes of abstraction and supply and submit the records to the DWA (in accordance with the licence conditions (where applicable); – Regularly manage crops, crop areas and irrigation systems to avoid applying water to unplanted areas or applying irrigation when not needed; – Develop a water management plan to unsure appropriate irrigation rates and scheduling are applied; – Design the irrigation system for improved	– Weekly irrigation infrastructure checks	– Project Manager – Foreman – Supervisor(s)

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		irrigation, uniformity and efficiency to reduce runoff and leaching; – Regularly maintain the irrigation system so that it continues to operate efficiently; – 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; and – Strict adherence to approved sustainable abstraction yields (as approved by DWA).		
Groundwater	– Groundwater contamination and potential ecological impacts.	– Fertilisers and pesticides shall be applied if and where necessary and shall be managed according to regulations and application instructions; – The use of chemical pesticides shall be avoided and minimised (quantity and frequency); – Biological control agents (BCA) shall not be used; – 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; – Store fuels or chemicals away from surface or groundwater resources; – All chemicals shall be labelled with the correct	– OHSE audits and inspections – Daily	– Project Manager – HSE appointed person

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		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 an impermeable contained surface; – Ensure the storage area is lockable and kept clean and organized; – Locate storage away from surface water and groundwater areas; – Have spill kits available where chemicals are stored and used; – Ensure chemicals are not exposed to heat; – Storage of fertilisers and fuels together is prohibited; – Educate staff on the dangers of pesticides and proper handling of chemicals; and – Monitor groundwater quality as recommended in the groundwater study (Appendix C of the scoping plus impact assessment report).		
Surface water	– Surface water contamination.	– Wastewater discharges shall be contained; – Workers will be made aware about the	– OHSE audits and inspections	– Project manager – Foreman

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		importance of wastewater management; – Good housekeeping; and – Ensure prompt clean-up of spills.	– Daily	– HSE appointed person
Centre pivot irrigation system	– Potential crop damage due to over or under irrigation due to malfunction or lack of inspections and maintenance.	– The irrigation system shall be inspected at least once a month to identify any signs of wear, damage or leaks; – The pivot's mechanical components (wheels, bearings, gears) shall be checked to ensure proper movement; – Regular cleaning of the sprinkler nozzles and filters will prevent clogging and ensure consistent water distribution; – Regular system flushing should be done to remove any sediment or debris that could hinder water flow; – Ensure all joints and connections are properly greased to prevent potential rusting; and – The system's water pressure should be checked regularly to ensure it matches the manufacturer's recommendations.	– Monthly	– Foreman/ HSE representative – Employees
Drip irrigation system	– Over-abstraction or uncontrolled abstraction of groundwater.	– Install flow meters and maintain abstraction records to ensure compliance with permitted volumes; – Use soil moisture sensors and evapotranspiration		

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		data to optimise irrigation scheduling; – Apply fertilisers through controlled fertigation systems and follow nutrient management plans; – Monitor groundwater quality as recommended in the groundwater study (Appendix C of the scoping plus impact assessment report) and – Maintain buffer distances from boreholes, wetlands and watercourses.		
Terrestrial environment and ecology	Increase in invasive species in cleared areas	– All Project equipment arriving on site from an area outside of the Project or coming from an area of known weed infestations (not present on the Project site) should have an internal weed and seed inspection completed prior to equipment being used (Appendix B); – Ensure the potential introduction and spread of alien plants is prevented; – Ensure the correct removal of alien invasive vegetation and prevent the establishment and spread of alien invasive plants; – Eradicate weeds and alien species as soon as they appear; and – Make workers aware about alien species and weeds.	– OHSE audits and inspections – Daily	– Foreman – HSE appointed person – Employees
Soil quality	– Soil impacts and	– Limit the possibility of compaction and reduce the	– Monthly	– Foreman/ HSE

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
	compaction due to mixing of earth matter and trampling.	use of heavy machinery or limit traffic on wet soils to avoid compaction. – Limit the possibility of trampling; – Implement efficient irrigation techniques, which deliver water directly to the plants' root zones and avoid excess water that can accelerate compaction; – Incorporate organic matter, such as compost or manure, to improve soil structure, enhance porosity, and increase soil aggregation; – Implement proper drainage systems to avoid waterlogging such as surface drainage systems; and – Monitor soil structure, moisture and components to ensure soil health.		representative – Employees
Waste management	– Generation and improper management of general (non-hazardous) waste leading to land contamination.	– Use covered, animal-proof bins and skips to prevent windblown litter, scavenger access and visual pollution, especially in temporary camps. – Implement routine waste collection schedules to prevent accumulation, with daily clean-ups at active exploration and camp areas. – Dispose of all general waste at licensed municipal landfills or waste facilities and prohibit informal dumping or burial on site.	– HSE audits and inspections	– Foreman – Environmental manager/officer

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		– Separate recyclable materials such as plastics, paper and scrap metal and direct them to local recycling facilities, where available. – Manage food waste carefully through sealed containers and frequent removal to minimise odours and attraction of wildlife or scavengers. – Brief exploration crews and contractors on waste management requirements and assign responsibility for housekeeping and waste control.		
	– Potential infiltration of non-contained domestic wastewater into groundwater resources.	– Ensure all wastewater containment structures are watertight, properly lined and constructed in accordance with the Water Resources Management Act, 2013 (Act No. 11 of 2013); – Locate sanitation facilities and wastewater storage systems at safe distances from boreholes, wells, drainage lines and areas of high groundwater vulnerability; – Arrange regular emptying and off-site disposal of wastewater by licensed service providers at approved wastewater treatment or disposal facilities; – Prohibit the discharge of untreated domestic wastewater onto land or into surface water bodies;	– HSE audits and inspections – Groundwater quality monitoring	– Environmental manager/officer – HSE appointed person – Foreman – Supervisor(s)

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		– Train workers on the correct use of sanitation facilities and on the environmental and health risks associated with improper wastewater disposal; and – Develop and implement a wastewater management plan, including emergency response procedures for spills, overflows, or system failures.		
	– Generation and improper management of hazardous waste.	– Hazardous materials such as agrochemicals, fertilisers, fuels, oils, and lubricants shall be stored in clearly labelled, secure, and weatherproof facilities with secondary containment to prevent spills and leaks; – Only approved and registered pesticides, herbicides, and fertilisers shall be used, and application shall be undertaken strictly in accordance with manufacturer instructions; – Surplus, expired, or obsolete agrochemicals shall not be disposed of on-site and shall be returned to suppliers where possible or disposed of at a licensed hazardous waste facilities; – Mixing and preparation of agrochemicals shall take place in designated areas with impervious surfaces, away from watercourses, boreholes, and	– HSE audits and inspections	– Environmental manager/officer – Foreman – Employees

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		drainage lines to prevent contamination of soil and groundwater; – Wash water from irrigation equipment, spray units, and chemical containers shall be reused in subsequent applications where feasible or disposed of in a controlled manner (diverted to contained wastewater); – Used oils, lubricants, filters, and hydraulic fluids from irrigation pumps, generators, and farm machinery shall be collected in sealed containers and disposed of through hazardous waste management facilities; – Refuelling and maintenance of irrigation infrastructure and machinery shall be conducted in designated areas equipped with spill kits and absorbent materials; – Any contaminated soil, absorbents or materials resulting from accidental spills shall be promptly removed and disposed of as hazardous waste at a licenced facility; – Personnel shall receive training on hazardous waste handling, chemical safety, spill response procedures, and the correct use of PPE; and – Records of hazardous waste generation, storage,		

Aspect	Potential impacts	Management and mitigation measures	Monitoring requirement	Responsibility
Operational phase				
		and disposal shall be maintained and made available for inspection by relevant authorities.		

5.1.3 DECOMMISSIONING PHASE

The decommissioning phase follows the operational phase. This section provides a site-specific plan developed to ensure that appropriate environmental and management practices are followed during the decommissioning phase. The section also outlines detailed remediation; site control and monitoring activities that will be conducted once irrigation infrastructure is no longer required.

The decommissioning phase:

- Provide effective and implementable site-specific procedures and mitigation measures to monitor and manage environmental impacts throughout the decommissioning phase. These measures aim to minimise the likelihood and extent of post decommissioning impacts;
- Establish a long-term management plan for the Project site to ensure its effective transition to its next intended use;
- Aims to eliminate the long-term liability issues and reduce the likely occurrence of irreversible impacts post site closure; and
- Provide a platform for the Proponent to engage/collaborate with local communities, stakeholders and regulatory authorities in the planning and implementation of decommissioning activities, including the disposal of waste, irrigation remnants and post closure care requirements.

The decommission phase or site closure is yet to be determined. However, should this be required or determined for any reason, the following general conditions outlined in Table 4 shall be followed and implemented, as best practice measures.

Table 4 - Identified aspects, impacts and mitigations associated with the Project decommissioning phase

Aspect	Potential impacts	Management and mitigation measures	Responsibility
Access and site activities	– Conflict with and neighbours/landowners.	– Use existing roads for access to avoid new tracks and create cut lines with due regard to existing land use activities in the area; – Ensure appropriate supervision of all decommissioning activities; – Maintain continuous engagement with neighbours/landowners to identify any concerns or issues and appropriate mitigation and management measures agreed upon; and – Accidents and incidents need to be reported to the Project manager and recorded in an incident register.	– Proponent – Project manager
Removal of irrigation infrastructure	– Damage to the biophysical environment (soil, remaining vegetation and generation of solid and hazardous waste).	– Prepare a decommissioning method statement prior to works; – Remove infrastructure in a phased and controlled manner; – Concrete anchor pads or foundations shall be broken up and removed where required, unless otherwise approved to remain in situ; – Drip lines, emitters, connectors and surface hoses will be: o Carefully lifted from the soil surface and o Rolled or bundled to prevent fragmentation and littering; – Filtration units, fertigation systems and pressure regulators shall be dismantled and removed; – Remaining water in pipelines, tanks and filters will be drained and flushed to prevent spills or contamination; – Buried pipelines and cables will be excavated using low-impact excavation methods where practicable; – Excavations should be limited to the minimum footprint necessary to remove infrastructure; and – Trenches should be backfilled immediately following removal to prevent erosion and safety hazards.	– Project Manager – Foreman – Employees

Aspect	Potential impacts	Management and mitigation measures	Responsibility
Occupational health and safety	– Injury or exposure to hazardous materials.	– Implement a decommissioning HSE plan; – Provide appropriate PPE; – Isolate and lock out electrical and mechanical systems; and – Clearly demarcate work areas.	– Project manager – Foreman – Contractors – Subcontractors
Visual	– Degraded landscape aesthetics.	– Restrict speed of vehicles (<40 km/h) to avoid excessive dust generation; – Remove all visible infrastructure unless otherwise agreed; – Re-contour disturbed areas to restore natural drainage patterns; – Rehabilitate land to blend with surrounding landscape; and – Remove waste and debris from site.	– Project Manager – Foreman – Employees
Air quality	Nuisance dust	– Apply water spraying or damping to exposed soils, access roads and active work areas during dry and windy conditions; – Limit the extent and duration of exposed surfaces by rehabilitating disturbed areas as soon as practicable; – Restrict vehicle speeds on unpaved roads (<40 km/h); – Cover loads of fine material during transportation; – Switch off engines when not in use to reduce unnecessary emissions; and – Schedule high-dust-generating activities during periods of low wind, where feasible.	– Project Manager – Foreman – Contractors – Subcontractors – Employees
Noise	– Noise exposure to nearby land users, workers and potential fauna.	– Limit decommissioning activities to daylight working hours; – Avoid simultaneous operation of multiple high-noise-generating equipment, where possible; – Ensure all machinery is well maintained and fitted with effective silencers and mufflers; – Use lower-noise equipment or methods, where feasible – Inform nearby land users in advance of particularly noisy activities, where	– Project Manager – Foreman – Contractors – Subcontractors – Employees

Aspect	Potential impacts	Management and mitigation measures	Responsibility
		applicable; – Rotate workers to minimise prolonged noise exposure; and – Switch off idle equipment to reduce unnecessary noise.	
Groundwater and surface water	– Groundwater contamination, safety risks from open boreholes and uncontrolled water flow.	– Decommission boreholes in accordance with DWA requirements; – Seal and cap boreholes properly; – Remove pumps, pipes and electrical components; – Prevent fuel, oil or chemical spills during removal; – Water tanks, reservoirs and concrete sumps will be: o Drained and cleaned, o Dismantled or demolished, and o Removed from site or rehabilitated to natural ground level.	– Project Manager – Foreman – Supervisor(s)
Terrestrial environment and ecology	Loss of habitat/habitat alteration	– Avoid unnecessary clearing during decommissioning; – Allow natural regeneration, where appropriate; – Re-vegetate disturbed areas with indigenous species if required; – Prevent the introduction or spread of invasive alien species; and – All Project equipment arriving on site from an area outside of the Project or coming from an area of known weed infestations (not present on the project site) should have an internal weed and seed inspection completed prior to equipment being used.	– Project Manager – Foreman – HSE appointed person
Soil quality	– Soil disturbance, compaction, potential erosion and altered surface drainage.	– Backfill excavated areas and re-contour land to natural profiles; – Rip compacted soils to restore infiltration; – Apply erosion control measures, where necessary; and – Reinstate topsoil and organic matter, where feasible.	– Project manager – Foreman – Employees
Waste management	– Generation and improper	– Removed materials should be segregated at source, including: o Metals (steel, aluminium),	– HSE appointed person

Aspect	Potential impacts	Management and mitigation measures	Responsibility
	management of general (non-hazardous) waste leading to land contamination.	○ Plastics (drip lines, fittings), ○ Electrical components, and ○ Hazardous materials – Reusable or recyclable materials should be: ○ Stored temporarily in designated areas, ○ Transported to licensed recycling facilities where available; and – Non-recyclable waste should be disposed of at a licenced waste disposal sites.	manager/officer – Foreman – Employees
	– Improper management of hazardous waste.	– Hazardous waste (oils, filters, contaminated PPE) will be handled and disposed of by licensed contractors; – Store hazardous waste in bunded, labelled containers; – Empty, flush and clean irrigation lines and tanks prior to removal; – Collect and dispose of residues in accordance with MSDS requirements; and – Decontaminate storage areas and mixing zones	

6 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 January 2026;

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) engaged contractors; and

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

APPENDIX A - ARCHAEOLOGICAL AND HERITAGE CHANCE FIND PROCEDURE

Responsibility

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

Procedure

Action by person identifying archaeological or heritage material
a) If operating machinery or equipment - stop work;
b) Demarcate the site with flag tape;
c) Determine global positioning system (GPS) position if possible; and
d) Report findings to foreman.

Action by foreman
a) Report findings, site location and actions taken to superintendent; and
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; and
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 geographic information system (GIS);
b) Advise NHC and request written permission to remove findings from work area; and
c) Recovery, packaging and labelling of findings for transfer to the 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; and
d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

APPENDIX B – WEED AND SEED INSPECTION FORM