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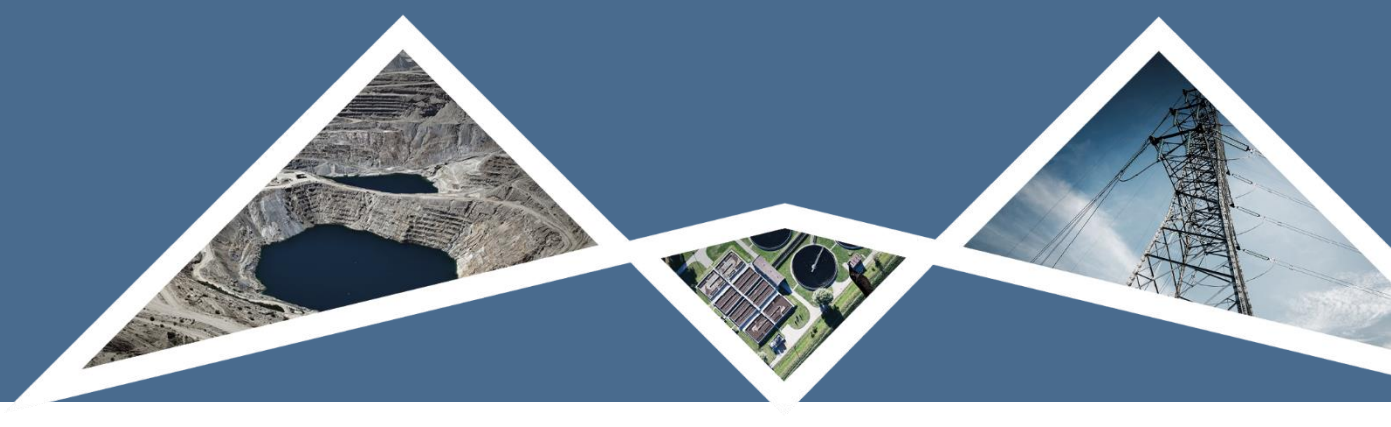
ENVIRONMENTAL MANAGEMENT PROGRAMME

WILLIET BOERDERY OLIE RIVIER FARM PIVOT EXPANSION EIA

DAEARDLR REFERENCE NC/EIA/05/PIX/SIY/DOU2/2021



DOCUMENT DETAILS

EIMS REFERENCE:	1398
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DOCUMENT TITLE:	Environmental Management Programme: Williet Boerdery Olie Rivier Farm Pivot Expansion EIA

DOCUMENT CONTROL

	NAME	SIGNATURE	DATE
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REVISION AND AMENDMENTS

REVISION DATE:	REV #	DESCRIPTION
2021/11/09	ORIGINAL DOCUMENT	Environmental Management Programme

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List of Abbreviations

DAEARDLR	:	Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform
EA	:	Environmental Authorisation
EAP	:	Environmental Assessment Practitioner
EIA	:	Environmental Impact Assessment
EMPr	:	Environmental Management Programme
NEMA	:	National Environmental Management Act
PPE	:	Personal Protective Equipment
PPP	:	Public Participation Process

1 INTRODUCTION

Williet Boerdery (Pty) Ltd (the Applicant) has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required authorisation processes (including the statutory public participation), and to compile and submit the required documentation in support of an application for Environmental Authorisation (EA) in accordance with the NEMA- Listed activities namely:

- GNR 984: Activity 15: "the clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-

  (i) The undertaking of a linear activity; or

  (ii) Maintenance purposed undertaken in accordance with a maintenance management plan."

- GNR 985: Activity 12: "the clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan-

  Northern Cape:

  i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;

  ii. Within critical biodiversity areas identified in bioregional plans;

  iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or

  iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.

The project will involve the expansion of agricultural activities on the farm Olie Rivier by introducing 3 new pivots that will require the clearance of approximately 70 ha of indigenous vegetation, primarily for the growing of potatoes. The 3 pivots will be 40 ha (pivot 1), 20 ha (pivot 2) and 10 ha (pivot 3) in size. In year 1, potato seeds will be planted on 20 ha of pivot 1 and in year 2 potato seeds will be planted on the other 20 ha of pivot 1. Thereafter potato seeds will be planted on pivot 2 and 3 in years 3 and 4, respectively. Crop rotation will be done thereafter by planting either corn, wheat, lucerne or peanuts on the pivots.

The proposed project is located on the Remaining Extent of the Farm Olie Rivier 170 (registration division: Kimberly), located along the R357 from Kimberly to Douglas, in the Siyancuma Local Municipality, Pixley Ka Seme District Municipality in the Northern Cape. The site is located approximately 26 km north-east of the town Douglas and 77 km south-west of the town Kimberly. The centre point of the site is: 28°57'26.5"S and 24°0'32.731"E. See Figure 1 for a locality map of the proposed project.

2 SCOPE OF THIS DOCUMENT

An Environmental Management Programme (EMPr) is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented, and that the positive benefits of the projects are enhanced. This EMPr has been compiled as a guideline, in accordance with the Environmental Impact Assessment Regulations (GN R982 of 2014 as amended) for the requirements of an EMPr, to establish the mitigation and management measures that need to be implemented to avoid, reduce and minimise potential environmental impacts arising out of any of the phases applicable to the project.

It should be noted, however, that an EMPr is a working document that should be updated on a regular basis, as and when necessary. The EMPr thus supports an on-going proactive mitigation approach and duty of care to the environment. The EMPr shall allow for risk minimization and will ensure legal compliance. This EMPr will also allow the user to make minor amendments to ensure continual revision and improvement of risk mitigation through the continual re-assessment of risks associated with the activity.

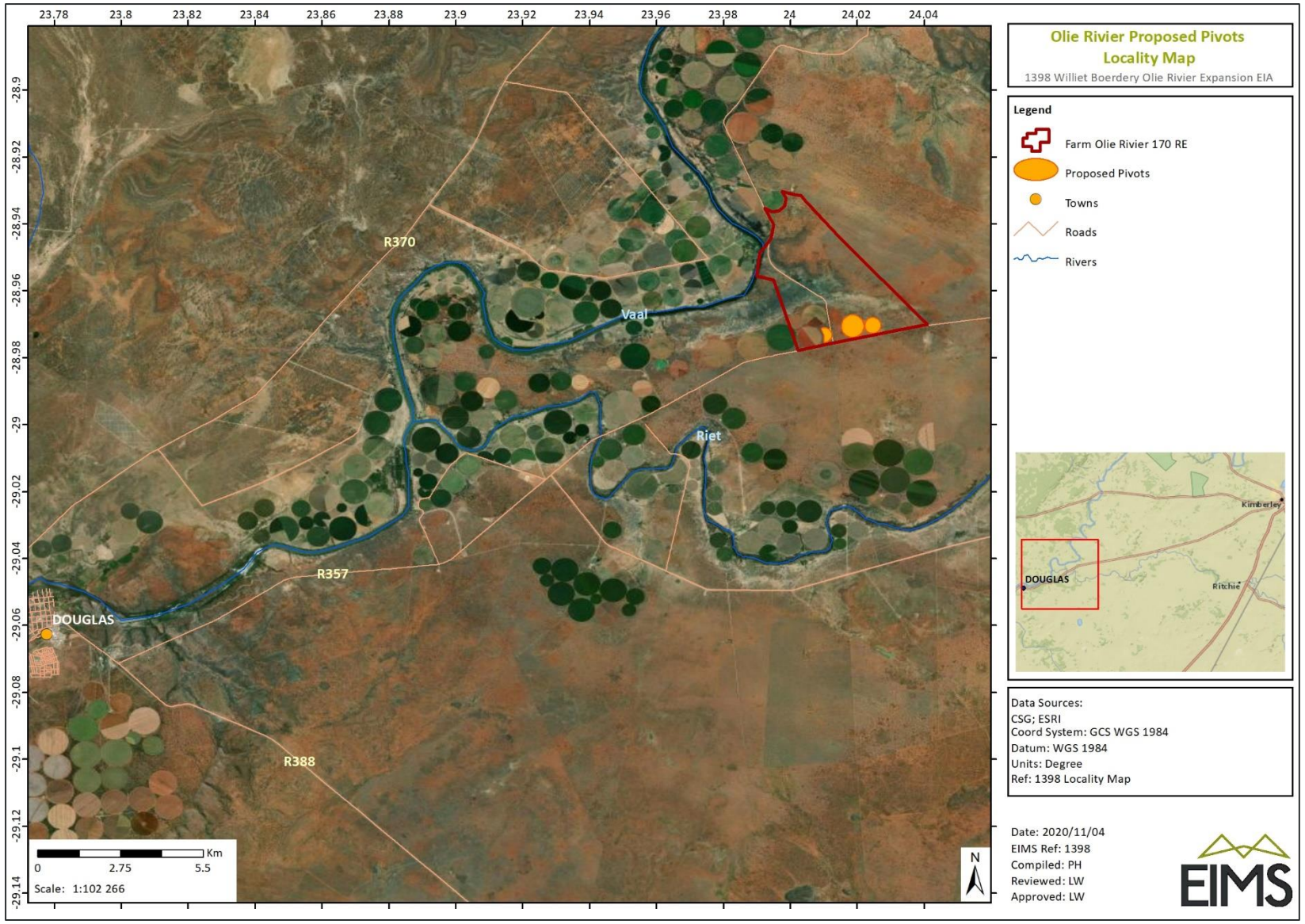


Figure 1: Locality of the proposed pivot expansion activities.

3 DOCUMENT STRUCTURE

Table 1: EMPr Structure

Appendix 4 Reference	Description	Section in EMPr
Appendix 4(1)(1)(a):	Details of – I. The EAP who prepared the EMPr; and II. The expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 4
Appendix 4(1)(1)(b):	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	Section 5
Appendix 4(1)(1)(c):	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Section 5.3
Appendix 4(1)(1)(d):	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified though the environmental impact assessment process for all phases of the development including – I. Planning and design; II. Pre-construction activities; III. Construction activities; IV. Rehabilitation of the environment after construction and where applicable post closure; and V. Where relevant, operation activities;	Section 11
Appendix 4(1)(1)(f):	A description of proposed impact management actions, identifying the manner in which the impact management contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to – I. Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; II. Comply with any prescribed environmental management standards or practices; III. Comply with any applicable provisions of the ac regarding closure, where applicable; and IV. Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Section 11
Appendix 4(1)(1)(g):	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 11
Appendix 4(1)(1)(h):	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 11
Appendix 4(1)(1)(i):	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 11
Appendix 4(1)(1)(j):	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 11
Appendix 4(1)(1)(k):	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 11
Appendix 4(1)(1)(l):	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 7
Appendix 4(1)(1)(m):	An environmental awareness plan describing the manner in which –	Section 9

Appendix 4 Reference	Description	Section in EMPr
	I. The Applicant intends to inform his or her Employees of any environmental risk which may result from their work; and II. Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
Appendix 4(1)(1)(n):	Any specific information that may be required by the competent authority.	N/A

4 REQUIREMENTS OF AN EAP

In terms of Regulation 13 of the EIA Regulations, 2014, an independent EAP, must be appointed by the Applicant to manage the application. EIMS has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations and Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the Regulations and all other applicable legislation;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the Applicant and the relevant environmental authority.

The declaration of independence of the EAPs involved and the Curriculum Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultants that were involved in the EMPr process, and the compilation of this report are attached as Appendix 1.

4.1 DETAILS OF THE EAP

EIMS was appointed by the Applicant as the EAP to compile this report. The contact details of the EIMS consultants who compiled the report are as follows:

Name of Practitioner	Ms Cheyenne Muthukarapan (EAP)	Mr Brian Whitfield (Project Oversight and Review)
Tel No.:	011 789 7170	011 789 7170
Fax No.:	086 571 9047	086 571 9047
E-mail:	cheyenne@eims.co.za	brian@eims.co.za

4.2 EXPERTISE OF THE EAP

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 25 years' experience in conducting EIA's, including many EIA's for mines and mining related projects. Please refer to the EIMS website (www.eims.co.za) for examples of EIA documentation currently available. The CV's of the EAP's involved in the compilation of this EMPr are included in Appendix 1 and a summary of experience is provided below.

Cheyenne Muthukarapan is a consultant at EIMS and has been involved in core aspects of numerous environmental impact assessment projects the past 4 years that she has been with the company. Her expertise lies in public consultation/participation processes and sustainability consulting. She has participated in numerous public/stakeholder consultations in relation to environmental impacts assessments, and the formulation of sustainable solutions to various environmental problems for a wide array of projects ranging from risk assessments, audits, EIAs and Basic Assessments for mining, gas exploration, wetland rehabilitation, road upgrades, etc.

Brian Whitfield assisted Pieter with the undertaking of this application process and compilation of the reports. Brian is a senior project manager at EIMS and has been involved in numerous significant projects over the past 17 years. He holds a BSc (Botany and Zoology) and a BSc Honours degree in Botany from the University of the Witwatersrand. Brian is a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (400447/13). He has been extensively exposed to various sectors, including Energy, Mining, Oil and Gas, Water and Waste Infrastructure. He is conversant with the South African environmental legislation as well as sustainability auditing, including Equator Principles, IFC Performance Standards and World Bank EHS

guidelines. Brian's experience includes Site Assessments, Water and Waste licensing, Environmental Monitoring and Auditing, Due Diligence Assessments, Competent Persons Reporting, Environmental Impact Assessments, Environmental Management Plans as well as Strategic Environmental Assessments.

5 DESCRIPTION AND SCOPE OF THE PROPOSED PROJECT

The section below provides a detailed description for the proposed pivot expansion activities. Most of the key information presented in this chapter was obtained from the Applicant. The aim of the project description is to describe the proposed activities planned to take place at the project area. Furthermore, the project description is designed to facilitate the understanding of the proposed project related activities which are anticipated to lead to the impacts as identified and assessed in the EIA Report and this EMPr. Impacts relating to these aspects were identified and mitigation measures and management procedures proposed in Section 11 of this EMPr.

5.1 PROJECT DESCRIPTION

The project will involve the expansion of agricultural activities on the property remaining extent of farm Olie Rivier 170 (registration division: Kimberley) by introducing 3 new pivots that will require the clearance of approximately 70 ha of vegetation, primarily for the growing of potatoes. The 3 pivots will be 40 ha (pivot 1), 20 ha (pivot 2) and 10 ha (pivot 3) in size. In year 1, potato seeds will be planted on 20 ha of pivot 1 and in year 2 potato seeds will be planted on the other 20 ha of pivot 1. Thereafter potato seeds will be planted on pivot 2 and 3 in years 3 and 4, respectively. Crop rotation will be done after each harvest by planting either corn, wheat, lucerne or peanuts on the pivots.

Crop rotation is the growing of different crops in succession on a specific field. This practise, if implemented correctly, can among other positive impacts, improve soil health and fertility, maintain soil structure and integrity, and help combat pests and weeds. Crop rotation is important, especially when planting potatoes, as potatoes are known heavy feeders, meaning they can easily deplete soils of nutrients. If rotations are not done, it could lead to a low harvest yield the following year or heavy reliance on fertilisers. Crop rotation will also help prevent disease such as blight, which is commonly caused by repeatedly planting potatoes on the same land. Blight is caused by a fungus-like organism which spreads in the foliage of potatoes, causing a collapse and decay of foliage and infection of the potatoes.

Water for the pivots will be sourced from an existing borehole and pumped through an existing underground PVC pipe (315 mm in diameter), which will be extended toward the 40 ha pivot. The existing pipe is approximately 1200 m in length and is used to water pecan nut trees. The pipe will be extended by a further 500 m to reach the 40 ha pivot. The pipe is not a listed activity under the NEMA, however it will only be extended if Environmental Authorisation for the proposed pivots is granted. See Figure 2 for a layout of the planned expansion activities overlayed on the biodiversity specialist identified site sensitivity. Water abstraction to be used on the farm was already listed with the Oranje Vaal Water Users Association on 17 August 2020 for 19 140 m3/ha. See Appendix G of the EIA report for the certificate of enrolment.

The protected tree *Vachellia erioloba*, occurs within the proposed development footprint. These trees have re-colonised the area over the last 20 odd years which is evident in terms of population size and structure. The density of these trees is less than the density in areas of primary vegetation. The half pivot planned (pivot 3), falls within an area of primary vegetation, thus the likelihood of floral species of conservation concern being affected is higher but is not considered significant. A search and rescue operation should be performed prior to clearing, it is however not a feasible or practical option regarding the protected trees, so it is recommended that trees between the pivots remain undisturbed. Alternatively, a permit is required if any protected trees need to be cut or removed within the development footprint.

5.2 PROJECT INFRASTRUCTURE AND ASSOCIATED ACTIVITIES

Table 2: Proposed farming expansion infrastructure and purpose.

Infrastructure	Purpose
315 mm PVC pipeline	Water for the pivots will be sourced from an existing borehole and pumped through an existing 1200 m underground 315 mm PVC pipe, which will be extended by a further

	500 m to reach the pivots. The water abstraction is approved by the Oranje Vaal Water Users Association.
Centre Pivot Irrigation System	The underground PVC pipeline will provide water to a centre pivot irrigation system. A centre pivot irrigation system is a moveable pipe structure which usually spans the length of a field and rotates around a pivot in the centre of the field. As the irrigation system rotates around its central pivot, it supplies water to crops through sprinklers along its length.

5.3 PROJECT SITE LAYOUT

Figure 2 below provides a visual representation of the proposed pivot layout in relation to the existing pivots and sensitive areas.

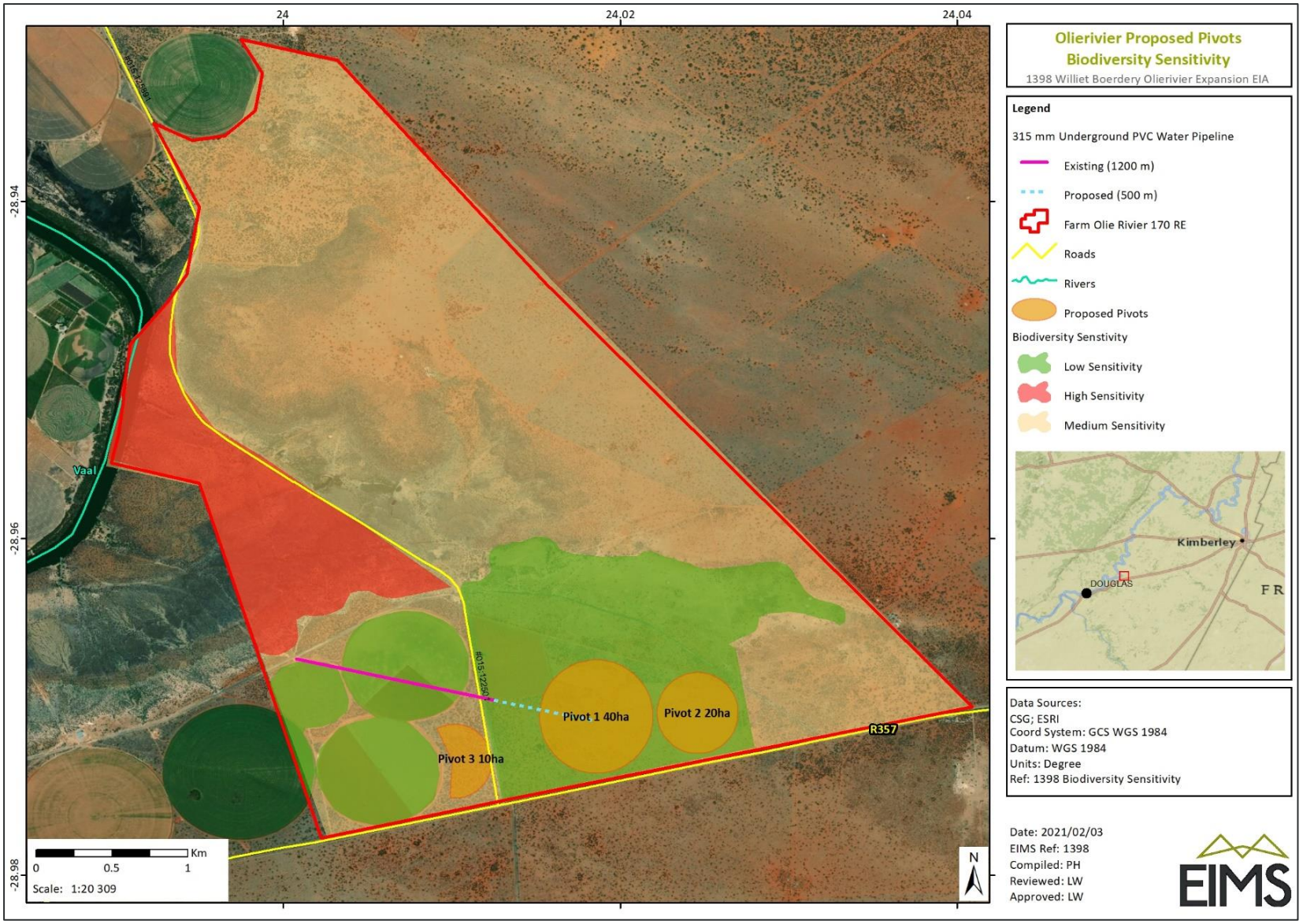


Figure 2: Specialist identified site sensitivity and proposed layout.

6 ROLES AND RESPONSIBILITIES

The Applicant will be responsible for ensuring overall compliance with the provisions of the EMPr. Implementation is the key to the success of the EMPr. To ensure that the EMPr and its mitigation measures are implemented, roles and responsibilities need to be clearly defined and documented prior to commencement. This section serves as a guide on which party is normally responsible for certain tasks. Specific roles are designated in the specific environmental management and mitigation requirements in this EMPr.

6.1 THE PROJECT APPLICANT/ PROPONENT

The Applicant is the principal party (Proponent) of the project. The legal accountability for correct implementation of the relevant requirements of the EA and EMPr falls primarily upon the Applicant and must therefore be built into all contractor's, contractual agreements. The Applicant's role typically includes:

- Provide for all necessary supervision during the execution of the project including appointment of key personnel to act on his/ her behalf during the different phases of the project phase (e.g. project manager/ farm manager). The key personnel will be tasked with ensuring that the various contractors/ developers, if any, comply with the necessary provisions of the EA and EMPr;
- Notify the relevant competent authority of changes in the development resulting in significant environmental impacts;
- Assess the various contractor's environmental performance during construction;
- Ensure compliance with regulations;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment.

Therefore, ultimately, the Applicant is responsible for the development and implementation of the EMPr and, where relevant, ensuring that the conditions in the EA are satisfied. Where construction activities are contracted out (e.g. to contractors and subcontractors), the liability associated with non-compliance still rests with the Applicant (unless otherwise agreed upon between the authorities, the Applicant and the contracting parties). The Applicant (and not the Contractor) is therefore responsible for liaising directly with the relevant authorities with respect to the preparation and implementation of the EMPr and meeting authorisation conditions.

6.2 THE PROJECT MANAGER/ FARM MANAGER

The Project Manager/ Farm Manager would oversee all contractors, if any, from a project management point of view. The roles of the Project Manager/ Farm Manager typically include the following:

- The Project Manager/ Farm Manager acts on behalf of the Applicant regarding the administration of contracts to sub-contractors, if any exist, etc.;
- Provides and/ or approves scheduling, aspects of co-ordination and estimating;
- Provide all necessary supervision during the execution of the project
- Ensures implementation of the project plan within cost, time and quality constraints;
- Ensures that implementation of the EMPr is executed as planned;
- Keeps the asset owner informed of progress made during the life cycle of the project;
- Monitoring construction by maintaining a permanent presence on site;
- Establishing and maintaining an environmental incident register;
- Taking required corrective action within specified time frame in respect of non-conformances and environmental incidents;

- Assist in finding environmentally acceptable solutions to construction problems;
- Attendance at HSE meetings, toolbox talks and induction programmes (where relevant);
- Inspect the site as required to ensure adherence to the management actions of the EMPr on a daily basis;
- Liaise with the construction team on issues related to implementation of, and compliance with the EMPr; and,
- Ensure adequate and compliant waste management.

6.3 THE CONTRACTOR

The contractor is usually a third party appointed by the Applicant/ Project Manager to undertake the actual construction of the project, if necessary. For the purposes of this section, any contractor on site (regardless of who appointed them) is referred to as the "Contractor".

The relevant contractors are answerable to the Project Manager/ Farm Manager for all environmental issues associated with the project. Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria. The principal contractor/ s, any other contractors and sub-contractors will be required to comply with the provisions contained herein, and accordingly, the EMPr and its provisions must form part of any contractual arrangements between the Applicant and contractors, and contractors and their sub-contractors, etc. The Contractor must comply with EMPr during construction and ensure that all his Employees and sub-contractors appointed by him/ her are familiar with the EMPr. The legal accountability for correct implementation of the relevant requirements of the EA and EMPr must be contractually bound to the appointed contractor, if any appointments are made.

The Contractors role includes:

- To ensure that implementation is conducted in an environmentally acceptable manner;
- To fulfil all obligations as per the agreed contract;
- To comply with special conditions as stipulated by surrounding Landowners during the negotiation process (if any); and
- Ensure that the Contractors staff and Employees have received the appropriate environmental awareness training prior to commencing construction.

6.4 THE AUTHORITIES

The authorities that should be involved include the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARDLR). The authorities may be required to perform the following roles:

- Review Monitoring and Audit reports, if required;
- Review whether there is compliance by the Applicant and Contractor with the terms of the EMPr and permit/ license conditions. Whenever necessary, the authorities should assist the Applicant in understanding and meeting the specified requirements; and
- The authorities may perform random controls to check compliance. In case of persistent non-compliance, the Applicant will be required to provide an action plan with corrective measures, and have it approved by the authorities.

7 ENVIRONMENTAL MANAGEMENT SYSTEM

The purpose of this EMPr is to ensure that the environment is properly considered during the design, construction, operations, and decommissioning phases, and that negative impacts are minimised or prevented, and positive impacts enhanced. At the same time the EMPr should provide a logical extension of the EIA, specialist studies, or any other technical planning and assessment documentation, to ensure that

recommendations are implemented, and that the project does not deviate from the environmental profile that formed the basis of the assessment.

7.1 DOCUMENT CONTROL

A formal document control system should be established. The document control system must provide for the following requirements;

- Documents are approved for adequacy prior to use;
- Review and update documents as necessary and re-approve document, if required;
- Ensure that changes and the current version status of documents are identified;
- Ensure that relevant versions of applicable documents are available at points of use;
- Ensure that documents remain legible and readily identifiable;
- Ensure that documents of external origin necessary for the EMPr are identified and their distribution controlled; and
- Prevent unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

The responsibility for establishing a suitable document control system rests with the Project Manager.

7.2 RECORD KEEPING

It is essential that an official procedure for control of records be developed to ensure records required to demonstrate conformity to environmental standards are maintained. The Applicant, or the Project manager (if assigned) is therefore required to develop and maintain a procedure for the identification, storage, protection, retrieval, retention and disposal of records as part of the EMPr. Records must be legible, identifiable and traceable.

7.3 RESPONDING TO NON-COMPLIANCES

Non-compliance will be identified and managed through the following four key activities including:

- Inspections of the site and activities across the site; and
- Monitoring of selected environmental quality variables.

An incident register must be prepared and maintained by the Project Manager/ Farm Manager throughout the construction phase in order to track and monitor environmental concerns, incidents, and non-conformances. The register must include details of date, location, description of the non-conformance or Incident, applicable environmental commitment/ standard, corrective action taken, adequacy of corrective action, date rectified, etc.

Non-compliance with the EMPr or any other environmental legislation, specifications or standards shall be recorded in the non-conformance register. This register shall be maintained by the Project Manager/ Farm Manager and will be sent to the Applicant on a regular basis (monthly during construction), and the Applicant shall ensure that the responsible party takes the necessary corrective actions.

7.4 ENVIRONMENTAL INCIDENCES

For the purposes of this project, an environmental incident can be divided into three levels, i.e. major, medium and minor. All environmental incidents shall be recorded in the non-conformance and incident register. Definitions and explanations of environmental incidents are provided in Table 3.

Table 3: Description of incidents and non-conformances for the purpose of the project

Non-Conformance	Any deviation from work standards, practices, procedures, regulations, management system performance etc. that could either directly or indirectly lead

	to injury or illness, property damage, damage to the workplace environment, legal transgression or a combination of these.
Major Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread, long-term, irreversible significant negative impact on the environment and/ or has a high risk of legal liability. A major environmental incident usually results in a significant pollution and may entail risk of public danger. Major environmental incidents usually remain an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc. Major environmental incidents may be required to be reported to the authorities. An example of a Major environmental incident would be a significant spillage (e.g. 500 litres) of fuel into a watercourse.
Medium Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread or localised, short term, reversible significant negative impact on the environment and/or has a risk of legal liability. A medium environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of medium environmental incidents should be reversible within a short to medium term with or without intervention. An example of a Medium environmental incident would be a large spill of fuel (e.g. >50 litres) onto land.
Minor Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, where the environmental impact is negligible immediately after occurrence and/ or once-off intervention on the day of occurrence. An incident where there is unnecessary wastage of a natural resource is also classified as a minor environmental incident. An example would be leaking water pipes that result in the wastage of water. A minor environmental incident is not reportable to authorities. An example of a minor incident is day to day spills of fuel or oil onto the ground where the spill is less than five (5) litres.

The following incident reporting procedures shall apply to this project:

- All environmental incidents shall be reported to the Project Manager/ Farm Manager, and shall be recorded in the non-conformance and incident register;
- An incident report shall be completed for all medium and major incidents and the report shall be submitted to the Project Manager/ Farm Manager within 5 calendar days of the incident;
- The Project Manager/ Farm Manager shall investigate all incidents and identify any required actions to prevent a recurrence of such incidents; and
- In the event of an emergency incident (unexpected sudden occurrence), including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the Applicant shall notify the relevant authorities in accordance with Section 30(3) of the NEMA.

8 REVIEW AND REVISION OF THE EMPR

It is important to note that this EMPr is made legally binding on the Applicant through the EA and the approval of the EMPr by the decision-making authority. It is important to consider that the EMPr is a dynamic document which may require such alteration and/ or amendment as the project evolves. Conditions under which the EMPr would require revision include:

- Changes in legislation;
- Occurrence of unanticipated impacts or impacts of greater intensity, extent and significance than predicted;

- Inadequate mitigation measures (i.e. where environmental performance does not meet the required level despite the implementation of the mitigation measure);
- Secondary impacts occur because of the mitigation measures; and
- Instances where the implementation of the specified management, because of changes in circumstances, may become impractical or unreasonable to implement.

The Applicant should be responsible for ensuring that the registration and updating of all relevant EMPr documentation is carried out. It shall be the responsibility of the Applicant to ensure that all personnel are performing according to the requirements of the document control procedure, and to initiate the revision of controlled documents, when required by changes in process or operations.

It is important to note that if alterations and/or amendments are required; these may only be affected with written approval from the competent authority and in accordance with the relevant legal processes.

9 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorisations, licences, permits and the approved EMPr and protection of the environment.

The Applicant and Contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and are capable of complying with the relevant environmental requirements. To obtain buy-in from staff, individual Employees need to be involved in:

- Identifying the relevant risk;
- Understanding the nature of risks;
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The Applicant shall ensure that adequate environmental training takes place. All employees shall have been given an induction on environmental awareness, proof of which needs to be a signed register of attendance. Where possible, the induction needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition of the environment;
- The importance of compliance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- Compliance with mitigation measures proposed for sensitive areas;
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the Applicant's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences (legal and/ or other) of departure from specified operating procedures including fines (where applicable);
- The mitigation measures required to be implemented when carrying out their work activities; and
- All operational risks must be identified, and processes established to mitigate such risk, proactively. Thus, the Applicant needs to inform the Employees of any environmental risks that may result from their work, and how these risks must be dealt with in order to avoid pollution and/ or degradation of the environment.

In the case of permanent staff required during the operational phase of the project, the Applicant/ Contractor shall provide evidence that induction was done, in the form of a signed attendance register. In the case of new

staff (including contract labour) the Contractor/ Applicant shall keep a record of adequate environmental induction training.

The specific requirements for environmental training during the construction phase include:

- Environmental Induction Training: All general workers must receive induction training which shall be presented by the Project Manager/ Farm Manager. The induction training must include an environmental management component. The training must include general environmental awareness and an overview of the approved EMPr and applicable authorisations, licences and permits.
- Informal training of all staff on site is also required on an on-going basis through informal discussions, on-site supervision and through facilitation of day-to-day activities. Such training must be given or otherwise facilitated by the Project Manager/ Farm Manager.

10 EMERGENCY RESPONSE PLAN

The Applicant must identify potential emergencies and develop procedures for preventing and responding to them. There are several options for dealing with high priority impacts and risks, as the paradigm has two components, probability and consequence. The design of control measures rests on understanding the cause and effect. Best practise is to intervene with the ultimate factors where feasible, rather than treat the outcomes. Emergency response therefore has the option of reducing probability or reducing the consequence while reducing the probability is the preferred option. Below are some common emergency preparedness approaches:

- Threat consequence if a risk eventuates, when the risk becomes an issue;
- Combine reducing the probability and treating the consequence;
- Offset environmental losses by investing in other assets;
- Not manage some of the risks because there are too many; and
- Make provision to manage residual impacts or issues that arise because of shortcomings in risk identification and rating, avoidance and mitigation or because a rare event has occurred.

Residual impacts are those impacts that despite reducing the probability and consequence might still occur. In these cases, parties will have to be compensated, pollution cleaned up and damage to the environment remediated.

The Applicant shall be required to develop and implement an Emergency Preparedness and Response Plan prior to commencing work. The Applicant must ensure that the Emergency Preparedness and Response Plan makes provision for environmental emergencies, including, but not limited to;

- Fire Prevention;
- Fire Emergency Response;
- Spill prevention;
- Spill Response;
- Contamination of a water resource;
- Accidents to Employees; and
- Use of hazardous substances and materials, etc.

The Applicant and Contractor must ensure that lists of all emergency telephone numbers/contact persons (including fire control) are kept up to date and that all numbers and names are posted at relevant locations throughout the lifespan of the project.

10.1 SPILL RESPONSE PROCEDURE

The Contractor must ensure that all Employees, staff and labourers are informed and instructed regarding implementation of spill prevention measures and spill response procedures. In the event of a spill, the following general requirements shall apply, and the detailed spill procedure must cater for these requirements;

- Immediately reporting of spills by all Employees and/ or visitors to the relevant supervisor (this requirement must be including in induction training);
- Take immediate action to contain or stop the spill where it is safe to do so;
- Contain the spill and prevent its further spread (e.g. earth berm or oil absorbent materials for spill to land or by deploying booms and/ or absorbent material for a spill to water);
- Dispose of any contaminated soil or materials according to appropriate waste disposal procedure. Note: Waste from spills of hazardous materials shall be disposed of as hazardous waste at a suitably licensed waste disposal facility;
- The Project Manager/ Farm Manager shall record details of the spill in their incident register;
- Photographic evidence shall be obtained of the spill clean-up.

In the case of large spills, the services of a specialist spill response agency shall be required, who shall advise on appropriate clean-up procedures and follow-up monitoring (if required). The incident procedures as defined in Section 11 shall also apply.

The Applicant must also, (as per Section 30 of the NEMA) notify the Director-General (DHSWS, DEA and DMR), South African Police Services, Provincial Environmental Authority, the Local Municipality, and any persons whose health may be affected of the nature of an incident including:

- Any risks posed to public health, safety and property;
- Toxicity of the substance or by products released by the incident and; and
- Any step taken to avoid or minimise the effects of the incident on public health and the environment.

10.2 MEASURES TO CONTROL OR REMEDY ANY CAUSES OF POLLUTION OR DEGRADATION

The broad measures to control or remedy any causes of pollution or environmental degradation as a result of the proposed activities taking place on the project are provided below:

- Limit the size of the area to be disturbed as far as is practically possible;
- Ensure that the environmentally sensitive areas are adequately demarcated throughout the construction phase;
- Ensure topsoil, subsoil and rock dumps are provided with adequate storm water runoff measures;
- Contain potential pollutants and contaminants (where possible) at source;
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates;
- Ensure the timeous clean-up of any spills; and
- Rehabilitate the site in line with the requirements of the rehabilitation plan

11 IMPACT MANAGEMENT AND MITIGATION MEASURES

This section provides management and mitigation measures that need to be implemented at the relevant phases of the proposed project to ensure that the identified impacts are properly managed and mitigated to avoid or minimise degradation of the surrounding environment and to positively impact the socio-economic aspects of the area. Table 4 below encapsulates the management and mitigation measures for all identified impacts. This

table also includes the party responsible for ensuring compliance with each management or mitigation measure, the party responsible for monitoring (and frequency thereof) compliance and the performance indicators that can be utilized to ensure that the target for each management and mitigation measure is achieved.

Table 4: Impact Management and Mitigation Measures

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
11.1 COMPLIANCE							
11.1.1 LEGAL COMPLIANCE WITH THIS EMPR AND THE EA							
A	Compliance with conditions as set out in the EA, if granted. Compliance with the conditions of this EMPr during the lifetime of the project and updated when needed as per Section 8 of this report.	Construction Production Decommissioning Rehabilitation	Ongoing compliance during the life of the project.	Project Manager	During construction and decommissioning of the pivots by maintaining an on-site presence. Regularly during rehabilitation (use own discretion) to ensure alien invasive species don't inhabit the pivot areas.	Ensures compliance with the granted EA and EMPr.	Non-compliances to be noted in a non-compliance/ incident register. Where possible, photos of an incident should be taken.
11.2 APPOINTMENTS							
11.2.1 APPOINTMENT OF CONTRACTORS							
A	The Applicant is responsible to appoint a Project Manager (either himself or the Farm Manager). The Project Manager needs to appoint Contractors/ farm workers if and when required. The Contractors, if required, should be suitably qualified for the job and should	Construction Production	Project manager and Contractors should be appointed prior to construction. Farm workers to be appointed prior to	Applicant Project Manager	Prior to construction and when required.	Appoint suitably qualified contractors sourced locally as far as reasonably possible.	Contract with contractors which includes qualifications and experience, if contractors are required. Signed register of all farm workers that worked on the project.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	preferably be sourced locally as far as reasonably possible.		harvesting and when required.				
			11.3 PLANNING AND DESIGN				
11.3.1	IMPACTS ON EXISTING INFRASTRUCTURE AND SERVICES						
A	Identify all infrastructure and services within proximity of the proposed project to be avoided. If any construction sensitive infrastructure and services (underground or above-ground) exist, they should be clearly marked, and contractors should avoid these.	Construction	Prior to the construction phase.	Applicant Project Manager	Project Manager to maintain an on-site presence during the construction phase.	No existing infrastructure is damaged or existing services are halted without notice because of construction.	Non-compliance/ incident register should indicate no damage to existing infrastructure and that no services were halted without notification. If any existing infrastructure are within proximity to the project area, these should be clearly marked to avoid any damage.
11.3.2	IMPACTS ON TRAFFIC						
A	The Applicant, Project Manager and Contractors, if any, should ensure that all construction/ production vehicles using public roads are in a roadworthy condition, that they adhere to the speed limits and that all local, provincial and national regulations are adhered to.	Construction Production Decommissioning	During the construction, production and decommissioning phases.	Applicant Project Manager Contractors	Prior to the commencement of the construction phase and when required during the production and decommissioning phases.	Ensure that no unreasonable traffic delays are caused because of the project and that all traffic regulations are adhered to.	All construction and production vehicles using public roads are road worthy. The non-compliance/ incident register should have no traffic complaints.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
11.4 HEALTH, SAFETY AND SECURITY							
11.4.1 IMPACT ON HEALTH AND SAFETY							
A	The speed limit on private/ unregulated roads (access roads) of construction and production vehicles should be limited to 30 km/h and all traffic rules on regulated roads should be adhered to.	Construction Production Decommissioning	During the life of the project.	Project Manager	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	To prevent dust nuisance and to promote road safety to all employees and the public.	No complaints in non-compliance/ incident register relating to bad driving or non-compliance with the speed limit and other road regulations. No complaints about dust nuisance relating to driving.
B	Employees must be made aware of their specific responsibilities in terms of the environmental impacts i.e. controlling noise levels, reducing dust, etc.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	Prevention of environmental impacts such as unregulated fire, noise- and dust pollution and littering.	No complaints in the non-compliance/ incident register relating to employees or construction workers harming the environment. Environmental awareness should be part of induction prior to commencement of the project and when required. A signed register of all employees that attended induction.
C	Employees must be made aware that no alcohol/drugs are allowed on site and no workers under the influence are permitted on site.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and	Contributes to the health and safety of all construction workers and	No complaints in the non-compliance/ incident register relating to employees or construction workers

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
					decommissioning phases. When required during production.	employees on-site and on the road.	that are under the influence or that have alcohol or drugs in their possession. Alcohol and substance usage should be part of induction. A signed register of all construction workers and employees that attended the induction.
D	Employees must be made aware that no unregulated open fires will be permitted on site.	Construction Production Decommissioning Rehabilitation	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	Prevent the spread of **unregulated** fires which could cause environmental damage, explosions or harm to construction workers, employees or the general public.	No complaints in the complaints register relating to employees or construction workers starting fires without permission from the Applicant or Project Manager. If evidence of an unregulated open fire is found the Project Manager must take photos and note it in the non-compliance/ incident register. Fire hazards should be part of the induction. A signed register of all construction workers and employees that attended the induction.
E	The required PPE shall always be worn on site.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the	To promote health and safety and prevent	No complaints in the non-conformance/ incident register relating to employees or

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
					construction and decommissioning phases. When required during production.	unnecessary harm to employees.	construction workers not wearing the required PPE. PPE should be part of the induction. A signed register of all construction workers and employees that attended the induction.
F	First aid equipment should be available at the farmstead or workshop.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager	Project Manager once-off prior to project commencement.	The availability of first aid equipment for use in a quick response if an employee is harmed.	First aid equipment is readily available.
11.5 EMERGENCY RESPONSE AND DISASTER MANAGMENT							
11.5.1 FIRE PREVENTION AND RESPONSE PROCEDURE							
A	The risk of fires should be assessed and where/ if required the relevant party shall ensure that fire breaks are created prior to the onset of construction. Fire breaks must be maintained as necessary to ensure they remain effective. A fire extinguisher, and if deemed necessary by the Applicant, additional firefighting equipment has to be available on-site during construction.	Construction Production Decommissioning	Fire risks should be identified prior to construction. Fire breaks to be maintained when required.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases.	Proper planning, maintained fire breaks and on-hand contact details of the firefighting department/ firefighting groups firefighting can prevent/ mitigate a major fire hazard.	The Applicant, Contractors and Project Manager have the necessary contact details of the firefighting department/ firefighting groups in the area at hand. Fire breaks are in good condition during construction, production and decommissioning phases. Firefighting equipment is readily

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
							available during construction.
B	Workers must be inducted on the handling of firefighting equipment.	Planning Construction	Prior to construction and Ongoing	Applicant Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases.	Training to be provided to workers.	Verification that appropriate fire prevention measures and response plans are in place where required. Evidence of firefighting training to be kept on site.
C	Smoking will be allowed; however, cigarette butts have to be put out and placed in a safe container.	Planning Construction	Prior to construction and Ongoing	Applicant Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases.	No cigarette butts littered on site.	Dedicated bins for the disposal of cigarette butts.
11.5.2 ACCIDENTAL SPILLAGE PROCEDURE							
A	A spill containment kit should be in place in the event of accidental spillages of hazardous chemicals (petrol, diesel and oil or production chemicals). Accidental spillages should be cleaned up immediately by the contractor or relevant employee, placed in sealed containers and disposed of at a licensed waste disposal site.	Construction Production Decommissioning	A spill containment kit needs to be assembled prior to construction and be available during the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	An adequate response can be implemented in case of spillages to help minimise the amount of dangerous chemicals entering the environment.	Spill containment kit available.
B	No storage of oil or fuel is allowed on-site. Any storage, if necessary, should be within a designated area and no direct contact between the						

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	storage containers and the ground is allowed.						
			11.6 SOCIO-ECONOMIC IMPACTS				
			11.6.1 EMPLOYMENT CREATION AND JOB LOSSES				
A	Employ people from the surrounding local communities, when required, as far as reasonably possible. Utilise existing community structures if available, to act as a communication link between the local community and the applicant for informing the local community of job opportunities and informing the Applicant of possible contractors in the local community. Opportunities should first be given to previously disadvantaged individuals where practically possible.	Construction Operation Decommissioning	When new employment opportunities are made available.	Applicant Project Manager	Project Manager, when and if required.	Employment of contractors and employees from surrounding communities will contribute to the reduction of unemployment as well as positively contribute to certain livelihoods in the community through income generation.	Contracts between the Applicant and suitably qualified Contractors/ employees, when required, from the local communities as far as reasonably possible.
B	It is proposed that the product also be sold locally if viable, to contribute to local food security.						
			11.7 SOIL AND EROSION CONTROL				
			11.7.1 IMPACT ON SOIL AND EROSION CONTROL				
A	All servicing/ maintenance of construction or production vehicles that could cause harm to the environment or spills must be done	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the	No vehicle servicing/ repairs on-site (if possible) to	The project manager should ensure that vehicles are in a good working condition. Any

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	off-site. No servicing of construction vehicles is allowed on site, except for minor repairs to prevent further environmental pollution or damage.				construction and decommissioning phases. When required during production.	prevent unnecessary leaks/ spillages to preserve the surrounding environment.	spillages must be recorded in the non-compliance/ incident register.
B	A spill containment kit should be in place in the event of accidental spillages of hazardous chemicals (petrol, diesel and oil or production chemicals). Accidental spillages should be cleaned up immediately by the contractor or relevant employee, placed in sealed containers and disposed of at a licensed waste disposal site.	Construction Production Decommissioning	A spill containment kit needs to be assembled prior to construction and be available during the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	An adequate response can be implemented in case of spillages to help minimise the amount of dangerous chemicals entering the environment.	Spill containment kit available.
C	Any evidence of erosion, scouring, sedimentation, and/or undercutting must be rectified and rehabilitated immediately. It is recommended that construction take place during the dry season as far as possible.	Construction Production Decommissioning Rehabilitation	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production and rehabilitation phases.	Prevention or if not possible rehabilitation of erosion, scouring, sedimentation or undercutting will prevent further degradation of soils.	The Farm Manager should make notes if evidence of erosion, scouring, sedimentation or undercutting is occurring in the non-compliance/ incident register and also take photos. Evidence in the form of photos after rehabilitation of erosion should also be available.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
11.8 NOISE GENERATION							
11.8.1 GENERATION OF NOISE THAT COULD BE HARMFULL OR A NUISANCE							
A	Ensure that all construction vehicles and industrial equipment are in a good working condition as to not generate unnecessary noise.	Construction Production Decommissioning	During construction, production and decommissioning phases.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	Vehicles on-site do not generate unacceptable noise pollution.	The project manager should ensure that vehicles are in a good working condition. No complaints of noise nuisance in the non-compliance/ incident register.
B	The Environment Conservation Act (Act 73 of 1989) (ECA), Section 25 of the Act and the Noise Regulations (GNR 154 of 1992) promulgated under this section, are still in effect. These regulations serve to control noise and general prohibitions relating to noise impact and nuisance. These regulations need to be complied with.	Construction Production Decommissioning	During the life of the project.	Applicant project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	Compliance with the noise regulations will prevent unnecessary noise nuisance.	The Project Manager should ensure that the regulations are complied with and note any irregularities in the non-compliance/ incident register to be rectified.
11.9 AIR QUALITY POLLUTION							
11.9.1 DUST GENERATION							
A	Strict on-site speed control should limit vehicle speeds to 30 km/hour.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning	To prevent excessive dust pollution related to driving.	Minimal dust visible while driving. Project Manager to note any non-conformances or complaints regarding dust in the non-

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
					phases. When required during production.		compliance/ incident register.
B	Access roads to the development footprint need to be well maintained.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	To prevent excessive dust pollution related to driving.	Minimal dust visible while driving. Project Manager to note any non-conformances or complaints regarding dust in the non-compliance/ incident register.
C	Construction should take place on non-windy days.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	To prevent excessive dust pollution related to driving.	Minimal dust visible while driving. Project Manager to note any non-conformances or complaints regarding dust in the non-compliance/ incident register.
11.10 HERITAGE AND PALAEONTOLOGICAL RESOURCES							
11.10.1 LOSS/ GAIN OF FOSSIL HERITAGE							
A	If unearthed, under no circumstances shall any heritage, archaeological or paleontological artefact/ feature be removed, destroyed or interfered with by anyone on the site, unless such removal has been authorised by the heritage authorities.	Construction	During the construction phase	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during construction.	Unauthorised removal or destruction of heritage, archaeological or palaeontological features could cause the loss of	Evidence that the heritage authorities were contacted if any features are discovered. If features are discovered, written evidence of permission from the authorities to remove or destroy the

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
						important features.	features are required. The Project Manager must note any non-conformance to this regard in non-compliance/ incident register.
B	Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts as set out in the NHRA (Act No 25 of 1999) Section 51 (1).	Construction	Prior to construction	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during construction.	Contractors and employees should be aware of penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts as set out in the NHRA (Act No 25 of 1999) Section 51 (1) to prevent any confusion.	Induction should include penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts as set out in the NHRA (Act No 25 of 1999) Section 51 (1). A register should be signed by all contractors and employees that underwent induction.
C	During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented:	Construction	During the construction phase	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during construction.	Unauthorised removal or destruction of heritage, archaeological or palaeontological features could cause the loss of	Evidence that the heritage authorities were contacted if any features are discovered. If features are discovered, written evidence of permission from the authorities to remove or destroy the

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	• An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon if any possible heritage resources or artefacts are identified. • Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted. • The qualified heritage practitioner/archaeologist will then need to come out to the site and evaluate the Heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource. • The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.					important features.	features are required. The Project Manager must note any non-conformance to this regard in non-compliance/ incident register.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	• Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner/ archaeologist.						
D	The following Chance Find Protocol should be followed if fossils are uncovered during excavation: • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/ her manager and the farm manager. The farm manager or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa.	Construction	During the construction phase	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during construction.	Unauthorised removal or destruction of heritage, archaeological or palaeontological features could cause the loss of important features.	Evidence that the heritage authorities were contacted if any features are discovered. If features are discovered, written evidence of permission from the authorities to remove or destroy the features are required. The Project Manager must note any non-conformance to this regard in non-compliance/ incident register.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. • Upon receipt of the preliminary report, the Heritage Agency will						

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	inform the farm manager (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the site manager. Fossil finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the						

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	developer may continue with the development on the affected area.						
11.11 BIODIVERSITY							
11.11.1 HABITAT FRAGMENTATION, LOSS OF NATURAL VEGETATION AND ALIEN INVASION IN A CBA 2							
A	Vegetation clearing should be restricted to areas of the pivots only.	Construction	During the construction phase	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during construction.	No unnecessary removal of vegetation. All vegetation clearing should be kept within the proposed pivot layout areas.	No unnecessary removal of vegetation.
B	Alien vegetation that has grown because of land clearing must be removed through approved methods	Construction	During the construction phase	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during construction.	Removal of alien vegetation from proposed project area.	Number of alien vegetation species prevalent in the cleared area.
11.11.2 LOSS OF SPECIES OF CONSERVATION CONCERN							
A	A permit is required if any protected trees need to be cut or removed within the development footprint.	Construction	Prior to the construction phase	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during construction.	No protected tree species is to be removed without approval.	Protected Trees Permit
11.11.3 ANTHROPOGENIC DISTURBANCES, INTENTIONAL AND/OR ACCIDENTAL KILLING OF FAUNA							
A	As the intentional killing of herpetofauna is considered a result of ignorance, this can be	Construction	Prior to the construction phase	Applicant Project	Project Manager to maintain an on-site presence	Prevent the unnecessary, unintentional	Visual observation for compliance with EMPr condition.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
	ameliorated through education. The labour force involved should be educated regarding the conservation importance of herpetofauna (especially snakes).			Manager Contractor	during construction.	killing of herpetofauna on site.	Environmental training to address how to manage herpetofauna on site.
			11.12 MANAGEMENT OF HAZARDOUS MATERIALS				
			11.12.1 STORAGE OF HAZARDOUS MATERIALS				
A	Keep Material Safety Data Sheets (MSDS) for each hazardous substance on-site and up to date, preferably close by the storage off the hazardous materials.	Production	During the production phase	Applicant Project Manager	Once-off prior to storage of hazardous materials.	MSDS for each hazardous substance readily available on-site to allow for a quick response should anyone be harmed.	MSDS for each hazardous substance should be available on-site near the hazardous materials storage area.
B	The applicable PPE should always be worn when working with hazardous materials.	Production	During production phase.	Applicant Project Manager	Project Manager to maintain an on-site presence when required during production.	Applicable PPE is worn when working with hazardous materials to promote health and safety.	Signs indicating PPE to wear when in the hazardous materials storage area or when working with the materials. Project Manager to note in the non-compliance/ incident register if the relevant PPE is not being worn.
C	All regulations relating to the storage and use of hazardous materials should be complied with.	Production	During the entire production phase.	Applicant Project Manager	Prior to storage of hazardous materials.	Prevent any harm to employees or damage to property	Project Manager should take photos of and note any non-conformance with regards to the storage of hazardous

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
						relating to the storage of hazardous materials.	waste in the non-compliance/ incident register.
D	Induction should include the possible hazards when working with or within the vicinity of hazardous materials.	Production	Prior to the production operations. When required during production if new contractors or employees are employed.	Applicant Project Manager	Project Manager (prior to production, and whenever new contractors or employees are employed)	Prevent any harm to employees relating to the handling of hazardous materials.	The induction should include the safe handling of hazardous materials. A register should be signed by all employees or contractors that attended the induction.
11.13 WASTE MANAGMENT							
11.13.1 MANAGEMENT OF WASTE							
A	Under no circumstances shall excretion and urinating be allowed other than in designated, regularly cleaned and stocked, ablution facilities.	Construction Production Decommissioning	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	Prevention of excretion and urination other than in designated ablution facilities.	Clean ablution facilities. Project Manager should note any indiscriminate excretion or urination in the non-compliance/ incident register.
B	No waste releases into the environment should be permitted.	Construction Production Decommissioning	During the entire life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When	To prevent pollution and keep a clean environment.	Project Manager to take photos and note any illegal waste release into the environment in the non-compliance/ incident register.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
					required during production.		
C	A dedicated waste collection and storage bin/ container must be prepared, and this should be emptied and collected wastes disposed of on a regular basis. Wastes must be disposed of at suitably licensed waste disposal facilities. Bins must be vermin/ weatherproof and be provided in enough numbers and capacity to store domestic waste. These bins must be kept closed to reduce odour build-up.	Construction Production Decommissioning.	During the life of the project.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	Ensure easy management and collection of all wastes on a regular basis.	No bins or skips should overflow with waste.
D	The active construction site must be checked daily to ensure that the site is free from litter and unnecessary wastes. During production the site must be checked when required.	Construction Decommissioning	During the entire construction and decommissioning phases	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases. When required during production.	To keep the environment clean from litter and waste.	No waste or litter lying in or around the project site.
E	Every construction vehicle should have a dedicated waste bin, which should be emptied regularly.	Construction Decommissioning	During the entire construction and decommissioning phases	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the construction and decommissioning phases.	To keep the environment clean from litter and waste.	No waste or litter lying in or around the project site and register of when bins where emptied.
F	Vegetation waste should be composted once removed.	Construction Decommissioning	During the entire construction and	Applicant Project	Project Manager to maintain an on-site presence	To keep the environment	No vegetation waste or litter lying in or around the project site.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
			decommissioning phases	Manager Contractor	during the construction and decommissioning phases..	clean from litter and waste.	
			11.14 DECOMMISSIONING AND REHABILITATION				
11.14.1 REHABILITATION PLAN							
A	Ensure the ground is cleared and levelled out on the site. The pivot footprints need to be revegetated with local indigenous grass species. The Project Manager should ensure that alien-invasive species that inhabit the development footprint be removed on a regular basis.	Decommissioning and Rehabilitation	During the decommissioning and rehabilitation phase.	Applicant Project Manager Contractor	Project Manager to maintain an on-site presence during the decommissioning phase. Project Manager to assess the site during rehabilitation on their own discretion.	The sites should resemble cleared and levelled pivot areas. The pivot footprints need to be revegetated with local indigenous grass species and any alien-invasive species should be removed during rehabilitation.	Site is levelled, cleared and the pivot footprints need to be revegetated with local indigenous grass species. The rehabilitation phase will be considered finished when the site resembles a semi-natural state, with minimum alien invasive species.
B	No waste should be left on the site.	Decommissioning and Rehabilitation	After the completion of all phases.	Applicant Project Manager	Project Manager to maintain an on-site presence during the decommissioning phase.	The sites should resemble cleared and levelled pivot areas. The pivot footprints need to be revegetated with local	No waste on-site.

Item Number	Management and Mitigation	Phase	Timeframes	Responsible Party	Monitoring Frequency	Target	Performance Indicators
						indigenous grass species.	

Appendix 1: EAP Curriculum Vitae

Name:	Cheyenne Muthukarapan
Nationality:	South African
Date of Birth:	3 January 1992
Profession:	Environmental Scientist
Professional Qualification/ Training:	B.S.c Environmental and Geographical Sciences; University of Cape Town
	Advanced Diploma Business Project Management; University of Cape Town
	Master's in Business Administration; European Business School (in progress)
	ArcGIS Working with imagery - online course, ESRI South Africa, 2017
	ArcGIS Geo-mapping - online course, ESRI South Africa, 2017
	IFC Environmental and Social Risk Management Training for Financial Institutions
Current Employer:	Environmental Impact Management Services (Pty) Ltd.

KEY EXPERIENCE

Ms Cheyenne Muthukarapan holds a Bachelor of Science degree in Environmental and Geographical Science from the University of Cape Town and an Advanced Diploma in Business Project Management from the University of Cape Town. Her expertise lies in public consultation/participation processes and sustainability consulting. She has participated in numerous public/stakeholder consultations in relation to environmental impacts, and the formulation of sustainable solutions to various environmental problems.

CAREER SUMMARY

Period: November 2016 - Current	Organisation: EIMS	Position: Junior Environmental Scientist
Key Projects/Assignments	• Consultant for the Sasol Secunda Plant Air Quality Education and Awareness Project as part of the offset programme required by the plants Air Emissions License; • Environmental and Sustainability consultant to Arup (Pty) Ltd for the Thabametsi Coal IPP (Lenders technical advisory team); • Consultant to the IDC for the Development of Sustainability Appraisal Framework; • Consultant for the Lesotho Ministry of Social Development for the development of the Lesotho Livelihood Project Environmental and Social Management Framework; • Consultant to the Department of Energy for the Development of the Department of Energy's Environmental Management Plan 2014-2019 • Public Participation Consultant for the Sasol Air Quality Matters Public Participation sessions;	

	• Environmental Management Plans update for EMPR for Harmony Gold. • Public Participation Specialist for Anker Coal Prospecting Right Renewal Application and Environmental Management Plan Update (Mpumalanga); • Public Participation Specialist for the City of Ekurhuleni Wetland and Watercourse Rehabilitation Project for the Kaalspruit, Rietspruit and Rietvlei Catchments; • Public Participation Specialist for Manungu Colliery Project (Delams); • Public Participation Specialist for Vlakvarkfontein Coal Mine Project (Ogies); • Public Participation Specialist for the Kangala Coal Mine Extension Project (Delmas); • Compilation of a Site and Retail Licence Application; • Public Participation Consultant for EcoRevert Pyrolysis Plant and Refinery (Gauteng); • Public Participation Consultant for Motuoane Hennenman Natural Gas Exploration Right (Free State); • Public Participation Consultant for the Harmony Hill Township Establishment (Sabie) • Public Participation Consultant for Pembani Coal Carolina (Carolina); • Public Participation Consultant for S. Bothma and Son Transport Sand Mine (Sasolburg); • Public Participation Consultant for Laudem Mining and Industrial Services (Pty) Ltd. Sand Mine (Free State); • Public Participation Consultant for Lothtech (Pty) Ltd. (Wynberg)

DECLARATION

I confirm that the above information contained in the CV is an accurate description of my experience and qualifications at the time of signature.

Date 2021-11-09

Name:	Brian Peter Whitfield
Nationality:	South African
Date of Birth:	20 October 1977
Profession:	Environmental Scientist
Professional Qualification/ Training:	BSc (Botany and Zoology); University of the Witwatersrand, 1998 BSc Honours (Botany); University of the Witwatersrand, 1999
Professional Membership/ Registrations:	Registered Professional Natural Scientist (SACNASP- #400447/13).
Current Employer:	Environmental Impact Management Services (Pty) Ltd.

KEY EXPERIENCE

Brian is a senior project manager at EIMS and has been involved in numerous significant projects over the past 17 years he has been with the company. He holds a BSc (Botany and Zoology) and a BSc Honours degree in Botany from the University of the Witwatersrand. Brian is a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (400447/13). Brian's broad range of experience includes managing and/or undertaking projects in various sectors, including Energy, Mining, Oil and Gas, Water and Infrastructure. He is conversant with the South African environmental legislation as well as sustainability auditing, including Equator Principles, IFC Performance Standards and World Bank EHS guidelines. Brian's other experience includes Site Assessments, Water-use licensing, Environmental Monitoring and Auditing, Due Diligence Assessments, Competent Persons Reporting, Environmental Management Plans and Strategic Environmental Assessments.

CAREER SUMMARY

Period: May 2014 - Current	Organisation: EIMS	Position: Senior Project Manager and Quality Reviewer
Key Projects/Assignments	Project Management including but not limited to the following key projects: • Ilima Colliery EIR/EMPR Amendment Application • Manungu Coal Mine Expansion (EIA, WML, IWUL) • Tetra4 Evander Exploration Right Application • Tetra4 Virginia Regional General Authorisation • Menar Kookfontein Prospecting Right Application • Sungu Sungu Dannhauser Oil and Gas Exploration Application • Sungu Sungu ER313 Oil and Gas Exploration Application • Eskom Real Estate (ERE) Waste Management Plan • Eskom Dolos Giraffe Substation BA • PH Bagale Lichtenburg Hospital BA • Old Mutual Properties Zonkizizwe Mixed Use Development Advisory Services	

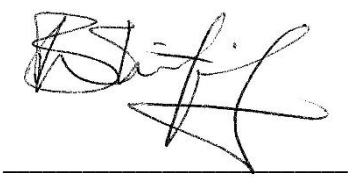
	• EMPR Performance Assessment audits on a number of Collieries • Water Use Licence external audits for mines, power stations, etc • Cennergi Tsitsikamma Community Wind Farm Annual External Audit (including IFC/World Bank compliance) • Cennergi Amakala Emoyeni Wind Farm Annual External Audit (including IFC/World Bank compliance) • Thabametsi Power Station Lenders Environmental Technical Advisor • Eskom Wittekleibosch Powerline and Substation Construction Audits • Eskom Dedisa Grassridge Powerline Construction Audits • Various audits for Eskom Power Stations Mentoring and Quality Control • Responsible for mentoring consultants on enviro-legal processes, project management, etc. • Quality review of reports to ensure compliance with legislation, guidelines, etc.	
Period: August 2012 – May 2014	**Organisation: EIMS (Full time secondment to Transnet State Owned Company Limited)**	**Position: Transnet Capital Projects Environmental Manager**
Key Projects/Assignments	Transnet Capital Projects (TCP) Environmental Manager on the New Multi-Product Pipeline (NMPP) Project under the umbrella of the Centre of Excellence. The project included the following aspects: • Pipeline 1: 554km of pipeline construction (30m wide servitude) from Durban Harbour (Island View) to Heidelberg (Gauteng) including construction of 2 Terminals, 3 Pump Stations and 2 Metering Stations. • Pipeline 2&3: 72km of Pipeline construction (30m wide servitude) from Jameson Park Terminal (Gauteng) via Alrode Terminal to Langlaagte Depot (Gauteng). • Pipeline 4: 89km of Pipeline construction (30m wide servitude) from Kendal Power Station (Mpumalanga) to Waltloo Terminal (Gauteng). Responsibilities: The following responsibilities applied to this position: • Develop and implement a plan and strategy to address the closeout of environmental components of the project. • Facilitate, co-ordinate and manage the environmental closeout and handover process of the project: o Facilitate the environmental execution of the reinstatement and rehabilitation of the Right of Way servitude (Wetland, erosion, grassing, etc); o Manage and ensure the landowner signoff of each property that has been obtained; o Ensure that all the required documents for handover have been prepared and are ready for handover to Transnet Pipelines (TPL); o Ensure all environmental risks are captured on the risk register and that all risks are mitigated and closed out; o Ensure that all actions from Community Liaison Forums (CLF's) and any other meetings are closed out.	

	• Plan, monitor and control the allocated budget. • Ensure compliance with all conditions of the Environmental Authorisation (EA), permits, licenses, etc. • Oversee the environmental performance of all contractors: o Ensure that all relevant information is shared with the contractor; o Ensure quality control of all environmental services. • Visit and check all sites to ensure that the work is being undertaken as required by the EA and Environmental Management Plan (EMP). • Facilitate environmental communication and engagement with internal and external stakeholders: o Interface with Interested and Affected Parties (I&AP's) where required; o Chair and facilitate regular feedback meetings with TPL and the environmental team; o Liaise with Government Departments as required; o Regularly meet with the Project Directors of the various teams on the project to ensure that environmental management is being adequately addressed. • Provide the necessary environmental input into designs, plans, etc. • Prepare environmental opinions and interpretations as and when required. • Sign off all Independent Environmental Audit reports. • Prepare and submit monthly progress and cost reports to various Executive Committee Members. • Support and manage the environmental team.	
Period: 19 May 2008 to 31 July 2012	**Organisation: EIMS**	**Position: ECO Manager and Independent Environmental Auditor to the Transnet NMPP Project**
Key Projects/Assignments	Responsibilities: • Manage team of Environmental Control Officers (10 individuals at peak of project construction) as well as acting as Independent Auditor during period of the project. • Assist with all permits and applications where applicable on the project e.g.: borrow pits, water use licenses (WUL), etc. including but not limited to: o The compilation of 40 borrow pit (mining permit) applications with 9 permits issued (others cancelled for various reasons). Closure applications for the 9 permits have additionally been undertaken. • Educate the construction team about the management measures of the EMP's and ROD's/EA's. • Regular liaison with the construction team and the project leader. • Recommend corrective action for any non-compliance incidents on the construction site. • Consult with the I&AP's and the contractor where required by the EMP.	

	• Comment on damage claims from the public. • Notify affected parties of changes to the construction programme should they be involved. • Ensure open communication channels between the affected parties and the contractor and respond promptly to queries and claims. • Develop a monitoring and auditing programme which is implemented for the duration of the construction phase of the project to monitor compliance with the conditions of the EMP's and RoD's/EA's. The management of this programme includes: o Ensure ECO's conduct daily audits in identified sensitive areas; o Ensure ECO's conduct weekly audits in their respective areas; o Compilation of a monthly audit report with a rating of the compliance with the EMP. This report is submitted to the relevant competent authorities including: ▪ Department of Environmental Affairs (DEA); ▪ Gauteng Department of Agriculture and Rural Development (GDARD); ▪ Department of Water Affairs (DWA – National). o Ensure ECO's keep a photographic record of any damage to areas outside the demarcated site area. The date, time of damage, type of damage and reason for the damage is recorded in full to ensure the responsible party is held liable; o Provide ad hoc advise and clarification on compliance issues to the responsible contractor; o Maintain records of compliance / non-compliance with the conditions of the authorizations and make available to competent authorities on request; o Assist the contractors in the identification of suitable contractors camp sites and delineation of environmental sensitive areas; o Review and approval of Environmental Awareness Training to be undertaken by the contractors or other suitable service providers.	
Period: July 2004 to 19 May 2008	**Organisation: EIMS**	**Position: Environmental Consultant**
Key Projects/Assignments	Was involved in and managed numerous projects during this time. A detailed list can be provided on request.	

DECLARATION

I confirm that the above information contained in the CV is an accurate description of my experience and qualifications and that, at the time of signature.



2021-11-09

Signature of Staff Member

Date