

APPENDIX 7

EMPrS

GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY



environmental affairs

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REPUBLIC OF SOUTH AFRICA

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INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including but not limited to the applicant and the competent authority (CA).

2. Purpose

This document constitutes a generic EMPr relevant to applications for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this generic EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this generic EMPr applies to the development or expansion of substation infrastructure for the transmission and distribution of electricity requiring EA in terms of NEMA. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and all associated listed or specified activities necessary for the realization of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general guidance and information and is not legally binding	Definitions, acronyms, roles & responsibilities and documentation and reporting.
B	1	Pre-approved generic EMPr template	Contains generally accepted impact management outcomes and impact

Part	Section	Heading	Content
			<p>management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity, which are presented in the form of a template that has been pre-approved.</p> <p>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.</p> <p>Where an impact management outcome is not relevant, the words “not applicable” can be inserted in the template under the “responsible persons” column.</p> <p>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template is not required to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA.</p> <p>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.</p>
	2	Site specific information	<p>Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr template contained in <u>Part B: Section 1</u>, and understands that the impact management outcomes and impact management actions are legally binding. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that</p>

Part	Section	Heading	Content
			<p>all impact management outcomes and impact management actions have been either pre-approved or approved in terms of <u>Part C</u>.</p> <p>This section must be submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of <u>Part B: section 2</u> not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.</p>
C		Site specific sensitivities/ attributes	<p>If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (<u>Part B: section 1</u>)</p> <p>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if <u>Part C</u> is applicable to the site, it is required to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding.</p> <p>This section applies only to additional impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in <u>Part B: section 1</u>.</p>

Part	Section	Heading	Content
		Appendix 1	Contains the method statements to be prepared prior to commencement of the activity. The method statements are not required to be submitted to the competent authority.

6. Completion of part B: section 1: the pre-approved generic EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
 - a 'responsible person',
 - a method for implementation,
 - a timeframe for implementation
- For monitoring
 - a responsible person
 - frequency
 - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template once signed and dated is legally binding. The holder of the EA will remain responsible for its implementation.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in Regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in Regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the property or farm in which the proposed substation infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features and within 50 m from the development footprint.

Sub-section 3 is the declaration that the applicant (s)/proponent (s) or holder of the EA in the case of a change of ownership must complete which confirms that the applicant/EA holder will comply with the pre-approved 'generic EMPr' template in Section 1 and understands that the impact management outcomes and impact management actions are legally binding.

(a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

"contractor" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"hazardous substance" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover as a minimum applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

"slope" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

“solid waste” means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

“spoil” means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

“topsoil” means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

“works” means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environment Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
MSDS	Material Safety Data Sheet
RI&APs	Registered Interested and affected parties

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: Guide to roles and responsibilities for implementation of an EMPr

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM)	<p><u>Role</u> The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be fully conversant with the conditions of the EA; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required; - Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and - Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS)	<p><u>Role</u> The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.</p>

Responsible Person(s)	Role and Responsibilities
	<p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Ensure that all contractors identify a contractor's Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	<p><u>Role</u></p> <p>The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.</p> <p>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested & Affected Parties (RI&APs), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.</p> <p><u>Responsibilities</u></p> <p>The responsibilities of the ECO will include the following:</p>

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> - Be aware of the findings and conclusions of all EA related to the development; - Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; - Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; - Assisting in the resolution of conflicts; - Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance;

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO)	<p><u>Role</u></p> <p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management: - Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compile investigation reports; - Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and / or licenses are in place and up to date; - Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;
Contractor	<p><u>Role</u></p> <p>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented</p>

Responsible Person(s)	Role and Responsibilities
	<p>as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
contractor Environmental Officer (cEO)	<p><u>Role</u></p> <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; - Attend the Environmental Site Meeting; - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; - Report back formally on the completion of corrective actions; - Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all substation infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be

recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in **(section 4.11)** below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in **(section 4.10)** above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECOs must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

PART B: SECTION 1: Pre-approved generic EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understand the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All staff must receive environmental awareness training prior to commencement of the activities;	ECO / cEO / dEO	Hold environmental awareness training workshops	Pre-construction Construction	ECO dEO	Monthly and as and when required	Attendance register and training minutes / notes for the record
– The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;	Contractor	Scheduling of sufficient sessions through consultation with the ECO / cEO / dEO	Pre-construction Construction	ECO dEO	Monthly and as and when required	Attendance register and training minutes / notes for the record
– Refresher environmental awareness training is available as and when required;	cEO / dEO in consultation with the ECO	Hold refresher environmental awareness training workshops	During the construction phase	ECO dEO	Monthly and as and when required	Attendance register and training minutes / notes for the record
– All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr;	cEO / dEO	Hold training workshops and ensure that the EA and EMPr is readily available	During the construction phase	ECO dEO	Monthly and as and when required	Attendance register and training minutes / notes for the record
– The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering.	Contractor	Develop and place appropriate posters at key locations	Pre-construction Construction	ECO dEO cEO	Monthly	Photographic record

<p>– Environmental awareness training must include as a minimum the following:</p> <ul style="list-style-type: none"> a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. 	<p>cEO / dEO in consultation with the ECO</p>	<p>Develop environmental awareness training material which covers the minimum requirements</p>	<p>Pre-construction Construction</p>	<p>ECO dEO</p>	<p>Prior to the commencement of the environmental awareness training</p>	<p>Environmental awareness training material requirements checklist</p>
<p>– A record of all environmental awareness training courses undertaken as part of the EMPr must be available;</p>	<p>ECO / cEO / dEO</p>	<p>Filing system including all proof of training (i.e. attendance register and training minutes / notes for the record)</p>	<p>During the construction phase</p>	<p>ECO dEO</p>	<p>Monthly</p>	<p>Completed and up to date filing system with proof of training</p>
<p>– Educate workers on the dangers of open and/or unattended fires;</p>	<p>cEO / dEO in consultation with the ECO</p>	<p>Develop environmental awareness training material which covers the dangers of open and/or unattended fire</p>	<p>Pre-construction Construction</p>	<p>ECO dEO</p>	<p>Prior to the commencement of the environmental awareness training</p>	<p>Environmental awareness training material requirements checklist</p>

- A staff attendance register of all staff to have received environmental awareness training must be available.	ECO / cEO / dEO	Filing system including all proof of training (i.e. attendance register)	During the construction phase	ECO dEO	Monthly	Completed and up to date filing system inclusive of all attendance registers
- Course material must be available and presented in appropriate languages that all staff can understand.	ECO / cEO / dEO	Develop environmental awareness training material in the required languages. Training material must be readily available to all staff	During the construction phase	ECO dEO	Monthly	Environmental awareness training material requirements checklist and the training register which must indicate the language of the training

5.2 Site Establishment development

Impact management outcome: Impacts on the environment are minimized during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if	Contractor	Development of an appropriate method statement	Pre-construction	ECO dEO	Once, prior to construction	Availability of the method statement which complies with the minimum requirements listed

one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;						
– Location of construction camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through;	DPM	Place construction camps outside of sensitive areas identified in the Basic Assessment Report	Pre-construction Construction	ECO dEO	Once, prior to construction	Availability of a layout and sensitivity map indicating avoidance of sensitive areas
– Sites must be located where possible on previously disturbed areas;	DPM	Place site outside of sensitive areas and within previously disturbed areas identified in the BA Report	Pre-construction	ECO dEO	Once, prior to construction	Availability of a layout and sensitivity map indicating avoidance of sensitive areas and placement within disturbed areas
– The camp must be fenced in accordance with <i>Section 5.5: Fencing and gate installation</i> ; and	DPM	Design and implementation of fencing as per the requirements of Section 5.5 of this EMPr	Pre-construction & Construction	ECO dEO	Once, prior to construction and once during the construction of the fencing	The camp is fenced in accordance with Section 5.5 of this EMPr
– The use of existing accommodation for contractor staff, where possible, is encouraged.	Not applicable – the development of new accommodation is not proposed. Staff will be accommodated in the nearby towns of Beaufort West and/or Prince Albert.					

5.3 Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development;	dEO / cEO in consultation with the ECO	Spatially demarcate access restricted areas informed by the BA Report	Pre-construction	ECO	Once, prior to construction	Access restricted areas are identified and provided in a spatial format
- Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and	dEO / cEO in consultation with the ECO	Erect appropriate temporary barriers around access restricted areas	At the commencement and for the duration of the construction phase	ECO	Monthly	Access restricted areas are closed-off through temporary barriers and barriers are maintained to a sufficient standard
- Unauthorised access and development related activity inside access restricted areas is prohibited.	Contractor / dEO / cEO	Erect appropriate temporary barriers around access restricted areas and provide clear signage of restricted status	During the construction phase	ECO	Monthly, and as and when required	Photographic evidence and notes of compliance that no unauthorised access or activities has taken place within the access restricted areas

5.4 Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- An access agreement must be formalized and signed by the DPM, Contractor and landowner before commencing with the activities;	DPM Contractor	Develop access agreements with the affected landowners. Ensure that agreements are approved and signed	Pre-construction	dEO ECO	Once, prior to construction	Availability of approved and signed negotiations
- All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition	Contractor	Undertake maintenance activities on private roads used for construction as degradation takes place	During the construction phase	cEO / ECO	Weekly	Photographic record of the pre-construction condition and degradation of roads, and records of the implementation and effectiveness of maintenance activities
- All contractors must be made aware of all these access routes.	dEO / cEO	Develop a map illustrating all access routes associated with the project and present and provide the map to all contractors	Pre-construction Construction	ECO	Once, prior to construction	Access routes map readily available

<p>- Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;</p>	<p>Contractor</p>	<p>All access routes developed that are not in-line with the access route agreements must be closed and rehabilitated to the pre-disturbance state</p>	<p>Construction and Rehabilitation</p>	<p>ECO</p>	<p>Bi-weekly (every two weeks)</p>	<p>Photographic record of the closure of access roads and re-vegetation</p>
<p>- Maximum use of both existing servitudes and existing roads must be made to minimise further disturbance through the development of new roads;</p>	<p>Contractor (and Eskom maintenance staff where relevant to operation)</p>	<p>Existing access routes to be used must be specified and the development of new roads must be avoided as far as possible</p>	<p>Construction and operation</p>	<p>cEO Operation and maintenance team</p>	<p>Weekly</p>	<p>Implementation of the approved layout</p>
<p>- In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with section 4.9: photographic record; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;</p>	<p>dEO / cEO</p>	<p>Record the conditions of private roads to be used (prior to use) as per the requirements of section 4.9 and agree on the required condition of the roads with the landowner, DPM and contractor</p>	<p>During the construction phase</p>	<p>ECO</p>	<p>Prior to the use of private roads</p>	<p>Photographic record and proof of the road conditions agreed upon with the relevant parties</p>

- Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands	DPM and Contractor	Design access roads to follow fence lines and avoid vegetated areas	Pre-construction	ECO	Once during the design and once prior to construction	Implementation of the approved layout
- Access roads must only be developed on pre-planned and approved roads.	Contractor	Construction of access roads only on pre-planned and approved access roads	During the construction phase	ECO dEO	Once during the design and weekly during the construction of access roads	Implementation of the approved layout

5.5 Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Use existing gates provided to gain access to all parts of the area authorised for development, where possible;	Contractor	Identify and inform all relevant staff of the existing gates to be used	Pre-construction & Construction	dEO	Monthly	Existing gates are utilised on a frequent basis and only limited new access gates are developed
- Existing and new gates to be recorded and documented in accordance with section 4.9: photographic record;	ECO	Existing and new gates will be recorded and documented as per the	During the construction phase	ECO	Once, when the construction of all new gates have been completed	Photographic record of the existing and new gates as per the requirements of section 4.9

		requirements of section 4.9				
- All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;	Contractor (and Eskom maintenance staff where relevant to operation)	Ensure all relevant gates are fitted with locks and are always locked	Construction and Operation	ECO Operation and maintenance team	Bi-weekly (every second week)	All gates are locked and no complaints from landowners are received in this regard
- At points where the line crosses an existing fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner;	dEO	Install new gates where required with the approval of the affected landowner	During the construction phase	ECO	Once, prior to construction and during the construction phase, as and when required	New gates are installed where required
- Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground;	Contractor	Install gates in a manner so that there is a gap of no more than 100mm between the bottom of the gate and the ground	During the construction phase	cEO	Once, during the erection of the gates during the construction phase	New gates installed as per the requirement
- Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;	Contractor	Implement a reinforced concrete sill beneath gates installed for jackal proofing	During the construction phase	cEO	Once, during the erection of the gates during the construction phase	New gates installed as per the requirement
- Original tension must be maintained in the fence wires;	Contractor	Maintain original tension of fences through required activities	During the construction phase	ECO	Monthly	No tension reduction on fence wires

- All gates installed in electrified fencing must be re-electrified;	Contractor	Electrify gates installed in electrified fencing	During the construction phase	ECO	Once, during the erection of the gates during the construction phase	Gates installed in electrified fencing is electrified
- All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities;	Contractor	Undertake maintenance activities on fences and barriers	During the construction phase	ECO	Monthly	Photographic record of maintained fences and barriers
- Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable;	Contractor	Fence construction camps, batching plants, hazardous storage areas and access restricted areas	During the construction phase	ECO	Once during the erection of fencing	Photographic record of fences erected
- Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner.	dEO/ cEO Contractor	Obtain written approval from the relevant landowner where temporary fencing is required to restrict life-stock movement	During the construction phase	ECO	To be monitored as temporary fencing is required	Written approval to be provided by the dEO
- All fencing must be developed of high quality material bearing the SABS mark;	Contractor	Make use of high quality materials approved by SABS	During the construction phase	cEO	To be monitored as fencing is erected during the construction phase	Use of high quality materials for fencing approved by SABS

- The use of razor wire as fencing must be avoided as far as possible;	Contractor	Razor wire must not be sourced or used for the erection of fencing	During the construction phase	ECO	To be monitored as fencing is erected during the construction phase	Fences erected do not make use of razor wire
- Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;	DSS and Contractor	Ensure fenced areas are locked as required through the implementation of a formalised process. Appoint a security company	During the construction phase	cEO	Weekly and as and when required	Fences are locked and no complaints from landowners are received. A security company is appointed
- On completion of the development phase all temporary fences are to be removed;	Contractor	Removal of all temporary fences	At the end of the Construction Phase	ECO dEO	Once, following the completion of the construction phase	No temporary fences associated with the project is present following the completion of the construction phase
- The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.	Contractor	Appropriate removal of all fence uprights	At the end of the Construction Phase	ECO dEO	Once, following the completion of the construction phase	No fence uprights associated with the project is present following the completion of the construction phase

5.6 Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; 	DPM / Contractor / dEO / cEO in consultation with the ECO	The onsite borehole must be registered with the DWS prior to commencement of activities	Prior to commencement, during construction and operational phase	ECO / dEO	Registration of borehole once off prior commencement of construction and monitoring of abstraction volumes on a daily basis during construction and during operation	Proof of registration of borehole from DWS and proof of daily records of abstraction volumes to be attached to monthly audit reports .
<ul style="list-style-type: none"> - The Contractor must ensure the following: <ul style="list-style-type: none"> a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and - c.All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. 	<p>Not applicable - During the construction phase, water will be abstracted from existing boreholes. At this stage, no water is planned to be abstracted from or discharged to any surface water systems such as rivers. It should be noted that the relevant General Authorisation (GA) applications have been submitted to the Department of Water & Sanitation (DWS), with the following references numbers having been allocated:</p> <ul style="list-style-type: none"> • Beaufort West Wind Farm: WU20820 • Trakas Wind Farm: WU20821 <p>All conditions / recommendations / mitigation measures set out in the relevant GAs (once issued) must be implemented and strictly adhered to.</p> <p>The exact details of water requirements will be confirmed during the detailed engineering phase. During the operational phase of the substation, water requirements are not applicable. The exact details of water requirements will be confirmed during the detailed engineering phase. At this stage, no water is planned to be abstracted from or discharged to any surface water systems. During the operational phase of the proposed substation, water requirements are not applicable.</p>					

<ul style="list-style-type: none"> - Ensure water conservation is being practiced by: <ul style="list-style-type: none"> a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged. 	Contractor / dEO / cEO, in consultation with the ECO	Implement the required water conservation measures throughout on-site construction processes	During the construction phase	ECO	Monthly, and as and when required	Successful implementation of water conservation
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5.7 Storm and wastewater management

Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;	Contractor	Implement measures for the control and management of runoff	During the construction phase	ECO	Weekly	No mismanagement of runoff or contaminated water due to the temporary concrete batching plant
- All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;	Contractor and cEO	Obtain approved absorbent material and make use of licensed waste disposal facilities for disposal of oil	During the Construction Phase	ECO	Monthly	Availability of approved absorbent material at the construction site and proof of disposal of oil at licenses disposal facilities

<p>– Natural stormwater runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO;</p>	<p>DPM in consultation with the ECO</p>	<p>Consultation between the DPM and the ECO to determine if water can be discharged directly into water bodies (where present). The necessary water quality testing must be undertaken prior to discharge</p>	<p>During the construction phase</p>	<p>ECO</p>	<p>As and when the need arises to discharge natural stormwater runoff and clean water</p>	<p>Proof of consultation between the DPM and ECO and the outcomes thereof to be provided. Proof of water quality testing and the results thereof.</p>
<p>– Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.</p>	<p>DPM in consultation with the ECO</p>	<p>Consultation between the DPM and the ECO to determine if water can be discharged directly into water bodies (where present). The necessary water quality testing must be undertaken prior to discharge</p>	<p>During the construction phase</p>	<p>ECO</p>	<p>As and when the need arises to discharge water</p>	<p>Proof of consultation between the DPM and ECO and the outcomes thereof to be provided. Proof of water quality testing and the results thereof.</p>

5.8 Solid and hazardous waste management

Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All measures regarding waste management must be undertaken using an integrated waste management approach;	Contractor	Develop and implement a waste management plan	During the construction phase	ECO	Monthly	Implementation of the waste management plan and proof of waste management through proof of responsible disposal
– Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;	Contractor	Provision of appropriate waste collection bins which are strategically placed throughout the site	During the construction phase	ECO	Weekly	Appropriate waste collection bins are available throughout the site
– A suitably positioned and clearly demarcated waste collection site must be identified and provided;	DPM and Contractor	Identify an appropriate location for the waste collection site which must be clearly demarcated through signage and temporary fencing	Design and Construction Phase	ECO	Once, prior to the commencement of construction	A waste collection site is appropriately placed and demarcated

- The waste collection site must be maintained in a clean and orderly manner;	Contractor	Regular collection of waste and maintenance of the area must be undertaken as per the waste requirements for the project during construction	During the Construction Phase	ECO	Weekly	The waste collection site is maintained and clean
- Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;	Contractor	Provide separate and marked bins for the different waste types associated with the construction phase	During the Construction Phase	cEO	Weekly	Separate waste bins are available on site and waste generated is separated into the relevant bins
- Staff must be trained in waste segregation;	cEO / dEO, in consultation with the ECO	Include waste segregation as part of the environmental awareness training material.	Pre-construction Construction	ECO	Monthly, and as and when required	Environmental awareness training material requirements checklist
- Bins must be emptied regularly;	Contractor	Bins must be emptied before reaching total capacity and on a regular basis as required for the project	During the construction phase	ECO	Monthly	No mismanagement of bins.
- General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company;	Contractor	Disposal of general waste at licensed waste	During the construction phase	ECO	Monthly	Disposal certificates of disposal at

		disposal facilities must be undertaken as per the waste management plan				licensed facilities to be provided
- Hazardous waste must be disposed of at a registered waste disposal site;	Contractor	Disposal of hazardous waste at licensed waste disposal facilities must be undertaken as per the waste management plan	During the construction phase	ECO	Monthly	Disposal certificates of disposal at licensed facilities to be provided
- Certificates of safe disposal for general, hazardous and recycled waste must be maintained.	Contractor	Obtain certificates for safe disposal of waste	During the construction phase	ECO	Monthly	Disposal certificates of disposal at licensed facilities to be provided and filed as part of the filing system

5.9 Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

<p>– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities;</p>	Contractor	Contractor to undertake activities which can cause spills of pollutants outside of watercourses	During the construction phase	ECO	Weekly	No incidents reported of spillage of pollutants into watercourses
<p>– In the event of a spill, prompt action must be taken to clear the polluted or affected areas;</p>	Contractor and cEO	Develop a management plan or process for implementation should a spill take place	During the construction phase	ECO	Weekly	Feedback must be provided by the contractor in terms of how the spill was handled and photographic evidence of the feedback must be provided and kept on record
<p>– Where possible, no development equipment must traverse any seasonal or permanent wetland</p>	cEO and Contractor	Ensure layout has been informed by the environmental sensitivities as determined by the basic assessment and specialist studies	Construction Phase	ECO	Once off review that the layout used is the approved one	Confirm no development equipment traverses any seasonal or permanent wetland as per the authorised layout by reviewing the as-built designs (once-off confirmation).
<p>– No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur;</p>	Not applicable – no estuaries are located within the study area.					

<p>- Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;</p>	<p>cEO, Contractor</p>	<p>Ensure that permeant crossings (access roads) are provided for access to the substation and associated infrastructure, if no alternative crossing is available</p>	<p>During the construction phase</p>	<p>cEO</p>	<p>Weekly</p>	<p>Confirm permeant crossings (access roads) were provided for only in the event that no alternative crossing was available to access the substation and associated infrastructure</p>
<p>- There must not be any impact on the long-term morphological dynamics of watercourses or estuaries</p>	<p>DPM, cEO</p>	<p>Develop a management plan or process for implementation should a spill take place within a watercourse and ensure continually monitoring</p>	<p>During the construction and operation phase</p>	<p>ECO, dEO</p>	<p>For all phases of the project life cycle (i.e. construction, operation, decommissioning)</p>	<p>Ensure watercourses are avoided (where required)</p> <p>Proof of implementation of management plan or process in the event that a spill took place within a watercourse (if any)</p> <p>Record of continuous monitoring of watercourses in audit reports</p>

<p>- Existing crossing points must be favored over the creation of new crossings (including temporary access)</p>	<p>DPM, cEO</p>	<p>Develop a management plan or process for implementation should a spill take place within a watercourse and ensure continually monitoring</p>	<p>During the pre-construction and construction phase</p>	<p>ECO, dEO</p>	<p>During the construction phase of the project.</p>	<p>Existing crossing points utilised as opposed to new ones created and no incidents reported of spillage of pollutants into watercourses</p>
<p>- When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:</p> <p>a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse</p> <p>b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</p> <p>c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and</p> <p>d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.</p>	<p>Contractor</p>	<p>Activities undertaken near watercourses must be in-line with and consider the specified environmental controls</p>	<p>During the construction phase</p>	<p>ECO</p>	<p>Monthly, and as and when required</p>	<p>No degradation of the watercourses and no incidents of destruction reported</p>

5.10 Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
General:						
– Indigenous vegetation which does not interfere with the development must be left undisturbed;	cEO, Contractor (and Eskom maintenance staff where relevant to operation)	Demarcate areas of indigenous vegetation to be avoided before clearance is undertaken	Construction and operation (i.e. for maintenance purposes)	ECO Operation and maintenance team	Weekly, and as and when required	No unnecessary clearance of indigenous vegetation is undertaken
– Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;	Contractor	Demarcate areas containing protected or endangered species to be avoided by construction activities	During the Construction Phase	ECO	Weekly, and as and when required	No clearance of protected or endangered species other than those permitted to be removed
– Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;	Relevant specialist in consultation with the Contractor	Develop and implement a Plant Search and Rescue Plan	Pre-construction & Construction	ECO	Weekly, and as and when required	Implementation of the Plant Search and Rescue Plan and photographic evidence and notes of the implementation of the plan

<p>– Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed;</p>	DPM	Undertake the permitting process in order to obtain the relevant permits for the removal of protected species. Permits must be kept on file	Pre-construction	ECO	Once, prior to the commencement of the construction phase and removal of the protected species	Permits on file
<p>– The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;</p>	ECO	Ensure that the audit report indicates all species rescued and replanted and provides feedback in terms of compliance with the conditions of permits for replanting	During the Construction Phase and following the completion of the Construction Phase	ECO	Once off or as and when required	ECO confirmed rescued and replanted programme implemented correctly.
<p>– Trees felled due to construction must be documented and form part of the Environmental Audit Report;</p>	ECO	Ensure that the audit report documents the details of trees felled	During the Construction Phase and following the completion of the Construction Phase	ECO	Once off or as and when required	Trees felled due to construction must be documented and form part of the Environmental Audit Report; Competent Authority permits on file

- Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;	Contractor	Felled trees, vegetation cuttings and debris must be disposed of at a licensed waste disposal facility	During the Construction Phase	ECO	Monthly	No felled trees, vegetation cuttings and debris are dumped in inappropriate locations and disposal certificates are available as proof of responsible disposal
- Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;	DPM and Contractor (and Eskom maintenance staff where relevant to operation)	A suitably qualified pest control operator must be appointed	Construction and Operation	ECO	As and when the use of herbicides is required	Only registered pest control operators must be appointed and proof of their registration must be provided
- A daily register must be kept of all relevant details of herbicide usage;	Contractor	Develop a daily register for the documentation of the details of herbicide usage	During the construction phase	ECO	Monthly	Daily register provided by the pest control operator
- No herbicides must be used in estuaries	Not applicable - no estuaries are present within the study area					
- All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to Section 5.3: Access restricted areas.	Contractor in consultation with the cEO	Spatially demarcate protected species and sensitive vegetation and implement appropriate	During the construction phase	ECO	Once, during the undertaking of the demarcation of the areas and the erection of the fencing	Demarcation and fencing is undertaken in-line with the requirements of section 5.3

		fencing where required as per section 5.3				
- Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.	Contractor	Remove all alien invasive vegetation and dispose of the removed vegetation at a licensed waste management facility	During the construction and operational phase	ECO	Monthly, and as and when required	Disposal certificates of disposal at licensed facilities to be provided and filed as part of the filing system

5.11 Protection of fauna

Impact management outcome: Disturbance to fauna is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;	dEO / cEO Contractor	Develop a procedure for dealing with livestock within the affected properties	Pre-construction and during the construction phase	ECO	Once, prior to the commencement of construction and as and when required during the construction phase	Written consent provided by the landowner and proof of representation of the landowner during interference
- The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;	dEO / cEO in consultation with the Contractor	Ensure that the planning and development programme considers	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and as and when required	The planning and development programme which includes

		breeding sites for wild bird species				the consideration of breeding sites for wild bird species
- Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present;	dEO / cEO in consultation with the Contractor (and Eskom maintenance staff where relevant to operation)	Avoid breeding sites and ensure that special care is taken in the presence of nestlings and fledgelings	During the Construction Phase Operation Phase	ECO Operation and maintenance team	Weekly, and as and when required during the construction. Monthly, and as and when required during operation	Photographic record of intact breeding sites
- Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;	dEO / cEO in consultation with the Contractor (and Eskom maintenance staff where relevant to operation)	All mitigation measures recommended by the avifauna specialist must be implemented	During the Construction Phase Operation Phase	ECO Operation and maintenance team	Weekly during construction and monthly during operation	Photographic record of compliance and successful implementation of the recommended measures
- No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;	dEO / cEO in consultation with the Contractor	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. These areas must be	During the Construction Phase	ECO	Monthly, and as and when required	No instances of poaching is reported

		demarcated as Access Restricted Areas				
- No deliberate or intentional killing of fauna is allowed;	dEO / cEO in consultation with the Contractor	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. These areas must be demarcated as Access Restricted Areas	During the Construction Phase	ECO	Monthly, and as and when required	No instances of deliberate or intentional killing is reported
- In areas where snakes are abundant, snake deterrents are to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and	dEO / cEO in consultation with the Contractor (and Eskom maintenance staff where relevant to operation)	Implement and maintain snake deterrents in areas where snakes are abundant	During the Construction Phase Operation Phase	ECO Operation and maintenance team	Once, during the construction and as and when required. Monthly during operation	Photographic record of the implementation and maintenance of snake deterrents
- No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.	DPM in consultation with the dEO	Undertake a permitting process to obtain the required permits	Pre-construction	ECO	Once, prior to the commencement of construction and as and when required	Permits for removal and/relocation must be kept on file and be readily available

5.12 Protection of heritage resources

Impact management outcome: Impact to heritage resources is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in Section 5.3: Access restricted areas; 	<p>DPM and a suitably qualified specialist</p> <p>dEO / cEO in consultation with the Contractor and ECO</p>	<p>Undertake a Heritage Walk-through Survey</p> <p>Spatially identify and demarcate areas of heritage significance as per the Heritage Walk-through Report and as per the requirements of section 5.3</p>	Pre-construction	ECO	Once, prior to the commencement of construction	Proof of avoidance of sensitive heritage features through details of avoidance and photographic records
<ul style="list-style-type: none"> Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; 	<p>Suitably qualified specialist in consultation with the ECO</p>	<p>Appoint a suitably qualified specialist to carry out the monitoring of excavations for fossils, artefacts and important heritage material</p>	During the Construction Phase	ECO	During the undertaking of excavations of fossils, artefacts and heritage material	Proof of appointment of a suitably qualified specialist and photographic record of required monitoring by the specialist

<p>– All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.</p>	<p>dEO / cEO in consultation with the Contractor and ECO</p>	<p>Develop and implement procedures for situations where human remains, archaeological, palaeontological or historical material are uncovered</p>	<p>During the Construction Phase</p>	<p>ECO</p>	<p>Weekly, during the construction phase and as required when required</p>	<p>Proof of work ceased and the required procedures followed in cases where material is discovered.</p>
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5.13 Safety of the public

<p>Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.</p>						
<p>Impact Management Actions</p>	<p>Implementation</p>			<p>Monitoring</p>		
	<p>Responsible person</p>	<p>Method of implementation</p>	<p>Timeframe for implementation</p>	<p>Responsible person</p>	<p>Frequency</p>	<p>Evidence of compliance</p>
<p>– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.;</p>	<p>cEO in consultation with the Contractor</p>	<p>Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project</p>	<p>Pre-construction Construction</p>	<p>ECO</p>	<p>Once, prior to the commencement of construction and weekly during the construction phase</p>	<p>Compliance with the Emergency Preparedness, Response and Fire Management Plan</p>
<p>– All unattended open excavations must be adequately fenced or demarcated;</p>	<p>Contractor</p>	<p>Ensure that all excavations undertaken is fenced and demarcated within a reasonable timeframe and in instances</p>	<p>During the Construction Phase</p>	<p>ECO</p>	<p>Weekly</p>	<p>Excavations are fenced where required and photographic proof can be provided</p>

		where excavations will be open for long-periods of time				
- Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed infrastructure and protective scaffolding;	Contractor	All staff must be easily identifiable and the climbing of infrastructure and scaffolding must be undertaken by authorised personnel as managed by the Contractor	During the construction phase	ECO	Monthly, and as and when required	No incidents of unauthorised climbing is reported
- Ensure structures vulnerable to high winds are secured;	Contractor	Ensure that sufficient stabilisation measures are implemented to secure structures vulnerable to high winds	During the construction phase	ECO	Weekly, and as and when required	No incidents of unstable structures due to high winds is reported
- Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.	cEO	Compile and regularly update as incidents and complaints are submitted from the public and indicate the actions taken to resolve the complaint	During the construction phase	ECO	Monthly, and as and when required	The incidents and complaints register is complete and provides all the required details

5.14 Sanitation

Impact management outcome: Clean and well-maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Mobile chemical toilets are installed onsite if no other ablution facilities are available;	Contractor	Mobile chemical toilets must be placed appropriately and in areas which avoid environmental sensitivities	During the Construction Phase	ECO	Weekly	Mobile toilets are installed and avoid environmental sensitivities
– The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;	Contractor in consultation with the cEO	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement.	Pre-construction & Construction	ECO	Monthly, and as and when required	No evidence of non-compliance identified
– Where mobile chemical toilets are required, the following must be ensured: a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;	Contractor in consultation with the cEO	The installation of the toilets by the Contractor must be as per the listed requirements	During the Construction Phase	ECO	Weekly	No evidence of non-compliance identified

<p>c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr;</p> <p>d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out;</p> <p>e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;</p> <p>f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;</p>						
<p>– A copy of the waste disposal certificates must be maintained.</p>	Contractor	Certificates obtained from the licensed waste disposal facility with the emptying of the toilets must be kept on file	During the Construction Phase	ECO	Monthly, and as and when required	Certificates for waste disposal from the licensed waste disposal facility

5.15 Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>– Undertake environmentally-friendly pest control in the camp area;</p>	Contractor	Only environmentally-friendly pest control must be used, when required	During the Construction Phase	ECO	As and when pest control is required for the project	Contractor to provide proof of pest control used being environmentally-friendly

- Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV/ AIDS;	cEO / Contractor in consultation with the ECO	The effects of sexually transmitted diseases and HIV/ AIDS must be covered in the Environmental Awareness Training	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during construction	Environmental awareness training material requirements checklist
- The Contractor must ensure that information posters on HIV/ AIDS are displayed in the Contractor Camp area;	Contractor	Develop and place information posters on HIV/ AIDS	During the Construction Phase	ECO	Weekly	Photographic evidence of poster placement
- Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;	cEO / Contractor in consultation with the ECO	Information and education of sexually transmitted diseases must be covered in the Environmental Awareness Training.	Pre-construction & Construction	ECO	Monthly	Environmental awareness training material requirements checklist
- Free condoms must be made available to all staff on site at central points;	Contractor	Placement of free condoms in mobile toilets and at the construction camps	During the Construction Phase	ECO	Monthly	Proof of placement of free condoms by the contractor to be provided
- Medical support must be made available;	dEO / cEO in consultation Contractor (and Eskom maintenance	Ensure that designated personnel with first aid training are available on	Construction and Operations	ECO	Monthly	Check the availability of first aid trained personnel and medical kits

	staff where relevant to operation)	site and that first aid kits to provide medical support is readily available				(including if these are complete in terms of supplies)
- Provide access to Voluntary HIV Testing and Counselling Services.	Contractor	Compile a HIV testing schedule and provide counselling services where required	During the Construction Phase	ECO	Quarterly, and as and when required	Voluntary testing schedules and proof of counselling (where undertaken)

5.16 Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;	Contractor	Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project	Pre-construction	ECO	Once, prior to the commencement of construction	Emergency Preparedness, Response and Fire Management Plan compiled
- The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;	Contractor	Develop an Emergency Preparedness, Response and	Pre-construction	ECO	Once, prior to the commencement of construction	Emergency Preparedness, Response and Fire

		Fire Management Plan specific to the project which covers accidents, potential spillages and fires				Management Plan includes required specifications
- All staff must be made aware of emergency procedures as part of environmental awareness training;	cEO / dEO in consultation with the ECO	Develop environmental awareness training material which covers the relevant emergency procedures	Pre-construction	ECO	Prior to the commencement of the environmental awareness training	Environmental awareness training material requirements checklist
- The relevant local authority must be made aware of a fire as soon as it starts;	Contractor in consultation with the ECO	Develop and include a procedure in the Emergency Preparedness, Response and Fire Management Plan for the event of a fire and the procedure to be followed for informing the local authority	Construction	ECO	As and when a fire occurs	The local authority was informed as per the relevant procedure set out in the Emergency Preparedness, Response and Fire Management Plan
- In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see Hazardous Substances section 5.17).	Contractor (and Eskom maintenance	Implement the required mitigation	Construction and Operations	ECO	As and when a spill or leak occurs	The mitigation measures included under

	staff where relevant to operation)	measures in the event of a spill or leak as per the requirements of Section 5.17.				Section 5.17 have been adhered to
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5.17 Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;	cEO in consultation with the Contractor	Develop a strategy of how hazardous substances can be and should be minimised	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the construction phase	Contractor to provide evidence of substances used for proof of compliance
- All hazardous substances must be stored in suitable containers as defined in the Method Statement;	Contractor	Develop a Method Statement for the storage of hazardous substances in suitable containers	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the construction phase	Photographic proof that hazardous substances are stored in suitable containers as per the requirements of the relevant Method Statements
- Containers must be clearly marked to indicate contents, quantities and safety requirements;	Contractor	Where hazardous waste is stored these must be	During the Construction Phase	ECO	Monthly	Photographic proof that containers are marked as per

		clearly marked indicating the required details of the contents				the requirements
- All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;	Contractor	Ensure that storage areas are sufficiently bunded which are of sufficient capacity to contain a spill / leak from the stored containers	During the Construction Phase	ECO	Monthly during the Construction Phase	Photographic proof that storage areas are bunded and proof that the bund areas are of sufficient capacity to contain a spill / leak from the stored containers
- Bunded areas to be suitably lined with a SABS approved liner;	Contractor	Ensure that bunded storage areas are suitably lined	During the Construction Phase	ECO	Once, during the Construction Phase	Photographic proof that bunded storage areas are suitably lined
- An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;	cEO / Contractor	Compile and update an Alphabetical Hazardous Chemical Substance (HCS) control sheet specific to the project	During the Construction Phase	ECO	Monthly, and as and when required	Complete and up to date control sheet provided by the Contractor
- All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);	cEO / Contractor	Keep a record of all hazardous chemicals and the respective MSDS	During the Construction Phase	ECO	Monthly, and as and when required	Record of hazardous chemicals and the respective MSDS

<p>– All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;</p>	<p>cEO / Contractor</p>	<p>Provide training for personnel working with HCS</p>	<p>Pre-construction</p>	<p>ECO</p>	<p>Once, prior to the commencement of construction and as and when required</p>	<p>Record of training provided to personnel working with HCS</p>
<p>– Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available;</p>	<p>cEO / Contractor</p>	<p>Develop environmental awareness training material which covers the relevant impacts and safety measures.</p> <p>Provide appropriate training and personal protective equipment for the relevant personnel handling hazardous substances and materials</p>	<p>Pre-construction & Construction</p>	<p>ECO</p>	<p>Prior to the commencement of the environmental awareness training and monthly during the construction phase for personal protective equipment</p>	<p>Environmental awareness training material requirements checklist and all relevant personnel have undergone appropriate training and have access to personal protective equipment</p>
<p>– The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers;</p>	<p>Contractor</p>	<p>Appropriate storage facilities must be constructed or obtained for the storing of diesel, other liquid fuel,</p>	<p>During the Construction Phase</p>	<p>ECO</p>	<p>Monthly, and as and when required</p>	<p>Storage tanks for the project are appropriate and no incidents are reported in this regard</p>

		oil and hydraulic fluid				
- The tanks/ bowzers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowzers (110% statutory requirement plus an allowance for rainfall);	Contractor	Appropriate storage facilities must be constructed or obtained for tanks as per the requirements listed	During the Construction Phase	ECO	Monthly, and as and when required	Storage areas for the tanks/ bowzers for the project are appropriate and no incidents are reported in this regard
- The floor of the bund must be sloped, draining to an oil separator;	Contractor	Appropriate storage facilities must be constructed as per the requirements listed	During the Construction Phase	ECO	Once, during construction	Bunded storage areas are constructed according to the requirements
- Provision must be made for refuelling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;	Contractor	Appropriately constructed refuelling facility must be developed as per the requirements. Drip trays must be provided for use	During the Construction Phase	ECO cEO	Monthly Weekly	Soils at the refuelling facility are protected as required and drip trays are provided and used
- All empty externally dirty drums must be stored on a drip tray or within a bunded area;	Contractor	Ensure that empty dirty drums are stored appropriately as per the requirements	During the Construction Phase	ECO cEO	Monthly Weekly	Drip trays or bunded areas are used for the storage of dirty drums

- No unauthorised access into the hazardous substances storage areas must be permitted;	Contractor	Ensure through the implementation of procedures that no unauthorised access is undertaken into the storage areas	During the Construction Phase	ECO	Monthly	Proof of the implementation of the relevant procedure must be provided by the contractor
- No smoking must be allowed within the vicinity of the hazardous storage areas;	Contractor	Inform all employees of the requirement and develop and place relevant signage in the relevant areas	During the Construction Phase	ECO cEO	Monthly Weekly	Photographic record of the signage placed must be provided
- Adequate fire-fighting equipment must be made available at all hazardous storage areas;	Contractor	Hazardous storage areas must be fitted with adequate fire-fighting equipment	During the Construction Phase	ECO	Monthly	Adequate fire-fighting equipment is available and has been serviced
- Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used;	Contractor	Provide a mobile refuelling unit as well as suitable ground protection, where required	During the Construction Phase	ECO	Monthly, and as and when required	A mobile refuelling unit and suitable ground protection is available for use
- An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times;	Contractor	Provide an appropriate spill kit for the project for the use of	During the Construction Phase	ECO	Monthly, and as and when required	Appropriate spill kits are available for use

		hazardous substances				
- The responsible operator must have the required training to make use of the spill kit in emergency situations;	cEO and Contractor	Provide training on the use of spill kits to the relevant employees	Pre-construction	ECO	Once, prior to the commencement of construction	Proof of training to be provided by the contractor
- An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;	cEO and Contractor	Provide an appropriate number of spill kits in relevant areas	During the Construction Phase	ECO	Monthly	Proof of appropriate number of spill kits in appropriate areas to be provided by the contractor
- In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to Section 5.7 for procedures concerning storm and waste water management and 5.8 for solid and hazardous waste management.	cEO and Contractor	Storage and disposal of contaminated soil must be in accordance with the National Environmental Management: Waste Act and sections 5.7 and 5.8 of this EMPr	During the Construction Phase	ECO	Monthly, and as and when required	Proof of storage and disposal in terms of the National Environmental Management: Waste Act must be provided. Certificates of disposal at licensed waste disposal facilities must be provided

5.18 Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area;	Contractor	Demarcate specific areas for the maintenance of vehicles and equipment	During the Construction Phase	ECO	Monthly	A dedicated area for the maintenance of vehicles and machinery is used.
– During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;	Contractor	Ensure that a drip tray is available for an emergency repairs required	During the Construction Phase	ECO	Monthly	Contractor to provide evidence of drip tray use for emergency repairs
– Leaking equipment must be repaired immediately or be removed from site to facilitate repair;	Contractor	Ensure that where leaking equipment is identified it is repaired immediately or removed from site for repairs	During the Construction Phase	ECO	Monthly	Contractor to provide details of equipment repaired or removed from site
– Workshop areas must be monitored for oil and fuel spills;	cEO	Undertake regular inspections of the workshop areas for oil and fuel spills and keep an updated register	During the Construction Phase	ECO	Monthly	Register of inspection

		of inspection on site				
- Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;	Contractor	Provide an appropriate spill kit for the project	During the Construction Phase	ECO	Monthly, and as and when required	Appropriate spill kits are available for use
- The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed;	Contractor	Ensure that the workshop area is sufficiently bunded in accordance with the required specification	During the Construction Phase	ECO	Once, during the Construction Phase and as and when required	Workshop area is bunded in accordance with the required specification
- Water drainage from the workshop must be contained and managed in accordance Section 5.7: Storm and waste water management.	Contractor	Ensure that water drainage from workshop area is managed as per the requirements of section 5.7	During the Construction Phase	ECO	Monthly	Workshop drainage is managed in accordance with the requirements

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Concrete mixing must be carried out on an impermeable surface;	Contractor	Provide impermeable surface for the	During the Construction Phase	ECO	Weekly	No concrete mixing is

		mixing of concrete				undertaken on open ground
- Batching plants areas must be fitted with a containment facility for the collection of cement laden water.	Contractor	Provide containment facility for the collection of cement laden water	During the Construction Phase	ECO	Weekly	No cement laden water is released into the environment
- Dirty water from the batching plant must be contained to prevent soil and groundwater contamination	Contractor	Provide containment facility for the collection of cement laden water (dirty water)	During the Construction Phase	ECO	Weekly	No cement laden water is released into the environment
- Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;	Contractor	Demarcate and provide a storage area for bagged cement in-line with the listed requirements	During the Construction Phase	ECO	Weekly	Photographic proof of bagged cement stored within the demarcated area
- A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;	Contractor	Provide a washout facility for the washing of associated equipment. Enforce limitations on water use for washing of equipment	During the Construction Phase	ECO	Weekly	No cement laden water is released into the environment. Only minimal water is used for washing
- Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licensed disposal facility;	Contractor	Make use of hardened concrete where	During the Construction Phase	ECO	Monthly	Certificates of disposal of concrete at

		possible or dispose of concrete in a suitable manner				licensed waste disposal facility
- Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;	Contractor	Bind empty cement bags and temporarily store it in an appropriate area on site	During the Construction Phase	ECO	Monthly	Proof of binding of empty cement bags and storage in an appropriate area on site to be provided by the Contractor
- Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions)	Contractor	Ensure that sand and aggregates are kept damp or otherwise protected from dust generation	During the Construction Phase	ECO	Monthly	Proof of damping (or alternative dust suppression) of sand and aggregates must be provided by the Contractor
- Any excess sand, stone and cement must be removed or reused from site on completion of the construction period and disposed at a registered disposal facility;	Contractor	Ensure that all excess sand, stone and cement is removed or reused	At the completion of the Construction Phase	ECO	Once, with the completion of construction	Certificates for the disposal of sand, stone and cement at licensed waste disposal facilities or proof of reuse must be provided
- Temporary fencing must be erected around batching plants in accordance with Section 5.5: Fencing and gate installation.	Contractor	Erect temporary fencing around batching plants as per the requirements	During the Construction Phase	ECO	Weekly	Temporary fencing is undertaken in accordance with section 5.5

		listed in section 5.5				
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5.20 Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;	Contractor	Apply appropriate dust suppressant	During the Construction Phase	ECO	Weekly	Contractor to provide proof of use of appropriate dust suppressants
– Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible;	Contractor	Proper planning for vegetation removal must be undertaken as well as for the associated rehabilitation	During the Construction Phase and Rehabilitation	ECO	Weekly	Plan for implementation must be provided by the Contractor
– Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;	Contractor	Ensure that specific limitations are placed on the transport and handling of erodible materials during high wind conditions or when a visible	During the Construction Phase	ECO	Bi-weekly (every second week)	No complaints submitted in this regard

		dust plume is present				
- During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level;	ECO	ECO to provide adequate recommendations	During the Construction Phase	Not Applicable		
- Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind;	Contractor	Place soil stockpiles in areas less affected by wind	During the Construction Phase	ECO	Bi-weekly (every second week)	Soil stockpiles are not exposed to wind and have not been eroded
- Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;	Contractor in consultation with the ECO	Contractor to implement erosion control measures as recommended and agreed with the ECO	During the Construction Phase	ECO	Weekly, until erosion is no longer a problem	Recommendations made by the ECO have been implemented by the Contractor
- Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas;	cEO / dEO / contractor (and Eskom maintenance staff where relevant to operation)	Inform all drivers of speed limits and place appropriate signage along the relevant roads	During the Construction Phase Operation Phase	ECO Operation and Maintenance team	Monthly	No complaints from community members are submitted
- Straw stabilisation must be applied at a rate of one bale/10 m ² and harrowed into the top 100 mm of top material, for all completed earthworks;	Contractor	Ensure that straw stabilisation is undertaken as per the listed requirements	During the Construction Phase	ECO	Monthly	Photographic record of all straw stabilisation undertaken

– For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.	Contractor	Appropriate dust suppressant measures are implemented	During the Construction Phase	ECO	Weekly	Photographic record of measures being implemented and the results thereof
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5.21 Blasting

Impact management outcome: Impact to the environment is minimized through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and	Not Applicable – no blasting proposed					
– Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.	Not Applicable – no blasting proposed					

5.22 Noise

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only;	Contractor	Ensure that noise limits do not exceed acceptable limits and avoid the use of	During the Construction Phase	ECO	Monthly, and as and when required	No complaints registered in this regard. No amplification equipment is used.

		amplification communication				
– All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained;	Contractor	Provide and implement silencing technology	During the Construction Phase	ECO	Monthly, and as and when required	No complaints registered in this regard. Silencing technology is utilised.
– Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers;	cEO	Update complaints register. Provide daily transport to and from site for employees	During the Construction Phase	ECO	Monthly, and as and when required	Complaints register provided by the cEO and proof of transportation services provided
– Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.	cEO and Contractor in consultation with the ECO	Compile a Code of Conduct for staff. Appropriate operating hours must be identified for the project.	Pre-construction and Construction	ECO	Once, prior to the commencement of construction	No complaints registered in this regard.

5.23 Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Designate smoking areas where the fire hazard could be regarded as insignificant;	cEO / Contractor	Identify and demarcate	Pre-construction & Construction	ECO	Monthly	Photographic record of

		through signage for designated smoking areas				designated smoking area
- Firefighting equipment must be available on all vehicles located on site;	cEO / dEO in consultation with the Contractor	Provide all vehicles with firefighting equipment	Construction	ECO	Monthly	All vehicles are fitted with firefighting equipment and the details thereof are provided by the cEO
- The local Fire Protection Agency (FPA) must be informed of construction activities;	cEO in consultation with the ECO	Undertake formal consultation to inform the local FPA of the associated construction activities	Pre-construction	ECO	Once, during the commencement of the Construction Phase	Proof of consultation with the FPA
- Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;	dEO / cEO / Contractor in consultation with the ECO	Develop environmental awareness training material which covers the contact numbers for the FPA and emergency services. Place the contact numbers for the FPA and	Pre-construction & Construction	ECO	Prior to the commencement of the environmental awareness training and once during the construction phase	Environmental awareness training material requirements checklist and photographic record of contact numbers on display

		emergency services at a visible and central location				
- Two-way swop of contact details between ECO and FPA.	ECO	Consultation between the ECO and FPA in order to exchange contact details	Pre-construction	Not Applicable		

5.24 Stockpiling and stockpile areas

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses and water bodies;	Contractor	Identify and demarcate an appropriate location for the storage of excavated materials	Pre-construction & Construction	ECO	Monthly	Excavated material is not stored within sensitive environmental areas
- All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;	Contractor	Implement appropriate and sufficient maintenance on stockpiled material regularly	During the Construction Phase	ECO	Bi-monthly (every second month)	Stockpiled material is maintained sufficiently and is clear of weeds and alien vegetation

- Topsoil stockpiles must not exceed 2 m in height;	Contractor	Enforce limitations for the height of topsoil stockpiles	During the Construction Phase	ECO	Bi-monthly (every second month)	Topsoil stockpiles do not exceed 2m in height
- During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.);	Contractor	Appropriate material must be provided in order to cover stockpiles when required	During the Construction Phase	ECO	Monthly	Contractor to provide proof of availability of appropriate material to cover stockpiles when required
- Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.	Contractor	Sandbags must be provided in order to prevent erosion of stockpiled materials	During the Construction Phase	ECO	Monthly	Contractor to provide proof of availability of sandbags to prevent erosion of stockpiled materials

5.25 Civil works

Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone;	Contractor	Collect and retain topsoil for terracing	During the Construction Phase Rehabilitation	ECO	Weekly	Proof of collection and retaining of topsoil
- Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards;	Contractor	Undertake rehabilitation of terrace embankments and areas	During the Construction Phase Rehabilitation	ECO	Weekly	Photographic record of rehabilitation of terrace embankments

		outside of the high voltage yard where applicable				and areas outside the high voltage yards
- Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;	Contractor	All disturbed slope areas must be stabilised	Rehabilitation	ECO	Weekly	Disturbed slopes are stabilised sufficiently
- These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;	Contractor	Stabilise slopes as per the design specifications	Pre-construction & Rehabilitation	ECO	Weekly	Slopes are stabilised as per the design specifications
- Rehabilitation of the disturbed areas must be managed in accordance with Section 5.35: Landscaping and rehabilitation;	Contractor	Undertaken rehabilitation of disturbed areas as per the requirements listed under section 5.35	Rehabilitation	ECO	Weekly	Rehabilitation of disturbed areas is undertaken in-line with the requirements of section 5.35
- All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and	Contractor	Use a licensed waste disposal facility for the disposal of excess spoil	During the Construction Phase	ECO	Monthly	Certificates obtained for the disposal of excess spoil at a licensed waste disposal facility
- Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.	Contractor	Spoil used for landscaping must be applied as per the listed requirements	Construction and Rehabilitation	ECO	Monthly	Photographic record of spoil used for landscaping purposes as well as feedback from the contractor

5.26 Excavation of foundation, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed landfill site, if not used for backfilling purposes;	Contractor	Use a licensed waste disposal facility for the disposal of excess spoil	During the Construction Phase	ECO	Monthly	Certificates obtained for the disposal of excess spoil at a licensed waste disposal facility
– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;	Contractor	Spoil used for landscaping must be applied as per the listed requirements	Construction and Rehabilitation	ECO	Monthly	Photographic record of spoil used for landscaping purposes as well as feedback from the contractor
– Management of equipment for excavation purposes must be undertaken in accordance with Section 5.18: Workshop, equipment maintenance and storage; and	Contractor	Undertake the management of equipment for excavation as per the requirements of section 5.18	During the Construction Phase	ECO	Monthly	Management of equipment is undertaken in line with the requirements of section 5.18
– Hazardous substances spills from equipment must be managed in accordance with Section 5.17: Hazardous substances.	Contractor	Undertake the management of hazardous substances spills from equipment as per the	During the Construction Phase	ECO	Monthly	Management of hazardous substances spills from equipment is undertaken in line with the

		requirements of section 5.17				requirements of section 5.17
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5.27 Installation of foundations, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Batching of cement to be undertaken in accordance with Section 5.19: Batching plants; and	Contractor	Undertake the batching of cement as per the requirements of section 5.19	During the Construction Phase	ECO	Monthly	Management of batching cement is undertaken in line with the requirements of section 5.19
– Residual solid waste must be disposed of in accordance with Section 5.8: Solid waste and hazardous management.	Contractor	Undertake the disposal of solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The disposal of solid waste is undertaken in line with section 5.8.

5.28 Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)

Impact management outcome: No environmental degradation occurs as a result of installation of equipment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Management of dust must be conducted in accordance with Section 5.20: Dust emissions;	Contractor	Manage dust as per the requirements of section 5.20	During the Construction Phase	ECO	Weekly	The management of dust is undertaken as

						per the requirements of section 5.20
– Management of equipment used for installation must be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage;	Contractor	Undertake the management of equipment for installation as per the requirements of section 5.18	During the Construction Phase	ECO	Monthly	Management of equipment is undertaken in line with the requirements of section 5.18
– Management of hazardous substances and any associated spills must be conducted in accordance with Section 5.17: Hazardous substances; and	Contractor	Undertake the management of hazardous substances and associated spills as per the requirements of section 5.17	During the Construction Phase	ECO	Monthly	Management of hazardous substances and associated spills is undertaken in line with the requirements of section 5.17
– Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management.	Contractor	Undertake the recycling or disposal of residual solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The recycling or disposal of residual solid waste is undertaken in line with section 5.8.

5.29 Steelwork Assembly and Erection

Impact management outcome: No environmental degradation occurs as a result of steelwork assembly and erection.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

- During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts	Contractor	Inspect areas where construction is being undertaken and remove and appropriately dispose of wasted/unused materials	During the Construction Phase	ECO	Weekly	Contractor to provide proof of inspection and removal of waste/unused materials and the appropriate disposal thereof (i.e. disposal certificates)
- Emergency repairs due to breakages of equipment must be managed in accordance with Section 5.18: Workshop, equipment maintenance and storage and Section 5.16: Emergency procedures.	Contractor	Undertake emergency repairs of equipment as per the requirements of section 5.18 and 5.16	During the Construction Phase	ECO	Weekly	Emergency repairs of equipment is undertaken as per the requirements of section 5.18 and 5.16

5.30 Cabling and Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous Management;	Contractor	Undertake the recycling or disposal of residual solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The recycling or disposal of residual solid waste is undertaken in line with section 5.8.

- Management of equipment used for installation shall be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage;	Contractor	Undertake the management of equipment for installation as per the requirements of section 5.18	During the Construction Phase	ECO	Monthly	Management of equipment for installation is undertaken in line with the requirements of section 5.18
- Management of hazardous substances and any associated spills shall be conducted in accordance with Section 5.17: Hazardous substances.	Contractor	Undertake the management of hazardous substances and associated spills as per the requirements of section 5.17	During the Construction Phase	ECO	Monthly	Management of hazardous substances and associated spills is undertaken in line with the requirements of section 5.17

5.31 Testing and Commissioning (all equipment testing, earthing system, system integration)

Impact management outcome: No environmental degradation occurs as a result of Testing and Commissioning.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management.	Contractor	Undertake the recycling or disposal of residual solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The recycling or disposal of residual solid waste is undertaken in line with section 5.8.

5.32 Socio-economic

Impact management outcome: enhanced socio-economic development.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- Develop and implement communication strategies to facilitate public participation;	dEO / cEO	Identify and implement appropriate strategies for communication with the communities through consideration of the community needs	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the construction	Communication is undertaken as per the identified strategies and no complaints are submitted regarding communication
- Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;	Contractor	Development and implement a Grievance Mechanism which considers the community needs and provides procedures for conflict resolution	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the construction phase	Conflict resolution is undertaken in line with the requirements of the Grievance Mechanism. No complaints on conflict resolution is submitted by the community
- Sustain continuous communication and liaison with neighboring owners and residents	Contractor	Development and implement a Grievance Mechanism which provides	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the	Communication / liaison with neighbouring landowners and residents are

		procedures for communication / liaison with neighbouring landowners and residents			construction phase	undertaken in line with the requirements of the Grievance Mechanism. No complaints on communication with neighbouring landowners and residents is submitted
- Create work and training opportunities for local stakeholders; and	Contractor	Develop and implement a "locals first" policy for the provision of employment opportunities	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the construction phase	The "locals first" policy is considered in terms of the employment and training opportunities
- Where feasible, no workers, with the exception of security personnel, must be permitted to stay overnight on the site. This would reduce the risk to local farmers.	Not Applicable - no workers, other than security is proposed to stay on-site overnight.					

5.33 Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

<p>– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage;</p>	<p>Contractor</p>	<p>Regular emptying of the bunds must be undertaken. This must be undertaken as per the requirements listed in sections 5.17 and 5.18</p>	<p>During the Construction Phase</p>	<p>ECO</p>	<p>Prior to site closure for more than 05 days</p>	<p>Bunds are emptied as per the requirements listed under sections 5.17 and 5.18</p>
<p>– Hazardous storage areas must be well ventilated;</p>	<p>Contractor</p>	<p>Install appropriate ventilation in all hazardous storage areas</p>	<p>During the construction phase</p>	<p>ECO</p>	<p>Prior to site closure for more than 05 days</p>	<p>Effective ventilation is installed in hazardous storage areas</p>
<p>– Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</p>	<p>Contractor / cEO</p>	<p>Ensure fire extinguishers are serviced, as required and are easily accessible with appropriate signage indicating location. Ensure service records are kept up to date and filed</p>	<p>During the Construction Phase</p>	<p>ECO</p>	<p>Prior to site closure for more than 05 days</p>	<p>Signage placed indicating location of fire extinguishers and service records</p>
<p>– Emergency and contact details displayed must be displayed;</p>	<p>Contractor / cEO</p>	<p>Place emergency and contact details which are readily available and easily accessible</p>	<p>During the Construction Phase</p>	<p>ECO</p>	<p>Prior to site closure for more than 05 days</p>	<p>Photographic proof of contact details on display</p>

- Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;	Contractor in consultation with the ECO	Hold a workshop with all security personnel to provide a brief of the project and security requirements. Provide facilities in order to contact management and emergency personnel	Pre-construction & construction	ECO	Prior to site closure for more than 05 days	Proof of the workshop held must be kept on file by the contractor.
- Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;	Contractor	Regular checks of night hazards must be undertaken	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Proof of checks of night hazards must be provided by the contractor
- Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.;	cEO / Contractor in consultation with the ECO	Identify any potential fire hazards and notify the relevant local authority	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Proof of notification of the fire hazards to the local authority must be provided by the Contractor
- Structures vulnerable to high winds must be secured;	Contractor	Ensure structures vulnerable to wind is secure prior to site closure	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Structures vulnerable to wind is secured prior to site closure
- Wind and dust mitigation must be implemented;	Contractor	Implement wind and dust mitigation prior to site closure	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Wind and dust mitigation is implemented prior to site closure

- Cement and materials stores must have been secured;	Contractor	Ensure cement and material stores are secured prior to site closure	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Cement and material stores are secured prior to site closure
- Toilets must have been emptied and secured;	Contractor	Ensure toilets are emptied and secured prior to site closure	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Toilets are emptied and secured prior to site closure
- Refuse bins must have been emptied and secured;	Contractor	Ensure refuse bins are emptied and secured prior to site closure	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Refuse bins are emptied and secured prior to site closure
- Drip trays must have been emptied and secured.	Contractor	Ensure drip trays are emptied and secured prior to site closure	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Drip trays are emptied and secured prior to site closure

5.34 Dismantling of old equipment

Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment;	Contractor	Appropriately store old equipment in a manner which prevents pollution to the environment.	Decommissioning	Eco	Monthly	Photographic record of appropriate storage of old equipment

		This could include the construction of bunded areas				
- Oil containing equipment must be stored to prevent leaking or be stored on drip trays;	Contractor	Appropriately store equipment containing oil through the use of drip trays or other suitable methods	Decommissioning	Eco	Monthly	Photographic record of appropriate storage of equipment containing oil
- All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers;	Contractor	Ensure all scrap steel is stacked neatly and store disused and broken insulators in appropriate containers	Decommissioning	Eco	Monthly	Photographic record of stacked scrap steel and containers containing broken and disused insulators
- Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment;	Contractor	Develop and implement a procedure for the dismantling and transportation of equipment containing pollution causing substances which prevents spillage and pollution of the environment	Decommissioning	Eco	Monthly	Proof from contractor that dismantling and transportation of equipment containing pollution causing substances has been undertaken in an appropriate manner

- The Contractor must also be equipped to contain and clean up any pollution causing spills; and	Contractor	Ensure sufficient spill kits are available for the clean-up of pollution causing spills	Decommissioning	Eco	Monthly	Sufficient spill kits are available on site
- Disposal of unusable material must be at a licensed waste disposal site.	Contractor	Make use of a licensed waste disposal site	Decommissioning	Eco	Monthly	Certificates obtained for the disposal at a licensed waste disposal site

5.35 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
- All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site;	Contractor	Develop and implement a rehabilitation plan for the rehabilitation of all disturbed areas. Dispose of all spoil and waste at a licensed waste disposal facility	Pre-construction & Rehabilitation	ECO	Weekly	Rehabilitation of the disturbed areas is undertaken as per the rehabilitation plan. All certificates of waste disposal at licensed facilities are available.

- All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983	Contractor in consultation with the ECO	Assess all slopes and determine whether contouring is required	Rehabilitation	ECO	Weekly	All slopes are assessed and contoured as required
- All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983;	Contractor in consultation with the ECO	Assess all slopes and determine whether terracing is required	Rehabilitation	ECO	Weekly	All slopes are assessed and terraced as required
- Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition;	Contractor	Ensure all berms have a slope of 1:4 and is replanted with indigenous species and grasses	Rehabilitation	ECO	Weekly	All berms have a slope of 1:4 and is replanted with indigenous species and grasses
- Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners;	Not applicable					
- Rehabilitation of access roads inside of farmland;	Not applicable					
- Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;	Contractor	Make use of indigenous species for rehabilitation	Rehabilitation	ECO	Weekly	Indigenous species are used for rehabilitation
- Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: Stockpiling and stockpiled areas);	Contractor	Ensure stockpiled topsoil is used as per the requirements listed under section 5.24	Rehabilitation	ECO	Weekly	Stockpiled topsoil is used as per the requirements listed under section 5.24

- Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;	Contractor	Ensure that topsoil is spread evenly	Rehabilitation	ECO	Weekly	Topsoil is spread evenly
- Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;	Contractor	Remove all visible weeds from placement area and topsoil before spreading the topsoil	Rehabilitation	ECO	Weekly	No weeds are visible in the placement area or the topsoil
- Subsoil must be ripped before topsoil is placed;	Contractor	Undertake the ripping of subsoil prior to the spreading of topsoil	Rehabilitation	ECO	Weekly	Subsoil is ripped before topsoil is placed
- The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;	Contractor	Plan the timeframe for rehabilitation in order to undertake vegetation planting during the optimal time for vegetation establishment	Rehabilitation	ECO	At the start of rehabilitation to confirm the correct timeframe	Rehabilitation is undertaken during the optimal time
- Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;	Contractor	All disturbed slope areas must be stabilised	Rehabilitation	ECO	Weekly	Disturbed slopes are stabilised sufficiently
- Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;	Contractor	Stabilise slopes as per the design specifications	Pre-construction & Rehabilitation	ECO	Weekly	Slopes are stabilised as per the design specifications

<ul style="list-style-type: none"> - Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. 	Contractor	Spoil used for landscaping must be applied as per the listed requirements	Rehabilitation	ECO	Weekly	Photographic record of spoil used for landscaping purposes as well as feedback from the contractor
<ul style="list-style-type: none"> - Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: <ul style="list-style-type: none"> a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area 	Contractor in consultation with a suitably qualified specialist	Make use of a suitable vegetation seed mixture should enhancement be required	Rehabilitation	ECO	As and when required	Use of a suitable vegetation seed mixture if required

6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

PART B: SECTION 2

7. SITE SPECIFIC INFORMATION AND DECLARATION

7.1. Sub-section 1: contact details and description of the project

7.1.1. Details of the Applicant:

Applicant Name	Beaufort West Wind Farm (Pty) Ltd
Contact Person	Rebecca Thomas
Physical Address	4th Floor Mariendahl House, Newlands on Main, Corner Main and Campground Road, Claremont, Cape Town, 7708
Postal Address	PO Box 45063, Claremont, 7735
Telephone	021 657 4045
Fax	N/A
Cell	(073) 871 5781
Email Address	[REDACTED]

7.1.2. Details and Expertise of Environmental Assessment Practitioner (EAP)

EAP Name	SLR Consulting South Africa (Pty) Ltd
EAP Qualifications	(Curriculum Vitae included)
Professional Affiliation/Registration	(Curriculum Vitae included)
Telephone	+27 11 467 0945
Fax	n/a
Email Address	lscottshaw@slrconsulting.com

Refer to **Appendix A** of the EMP for the detailed experience of the EAP and the Project Team.

7.1.3. Project Details

Project Name:

PROPOSED CONSTRUCTION AND OPERATION OF THE BEAUFORT WEST WIND FARM 33/132kV SUBSTATION AND ASSOCIATED INFRASTRUCTURE, NEAR BEAUFORT WEST IN THE PRINCE ALBERT LOCAL MUNICIPALITY, WITHIN THE CENTRAL KAROO DISTRICT IN THE WESTERN CAPE PROVINCE

7.1.4. Project Description

Beaufort West Wind Farm (Pty) Ltd is proposing to construct one (1) 33/132 kilovolt (kV) onsite Substation¹, one (1) Battery Energy Storage System (BESS), one (1) laydown area and one (1) Operations & Maintenance (O&M) Building which will be to the authorised Beaufort West Cluster of wind developments, 60km south of the town of Beaufort West in the Western Cape Province. The proposed development area falls within the Prince Albert Local Municipality, within the Central Karoo District Municipality, and will be located within the site proposed for the authorised Beaufort West and Trakas Wind Farms.

The proposed development will service both of Mainstream's authorised wind farm projects (namely the Beaufort West Wind Farm - DFFE REF: 12-12-20-1784-1-AM2 and Trakas Wind Farm -DFFE REF: 12-12-20-1784-2-AM2) and associated electrical infrastructure (14-12-16-3-3-2-925-1 & 14-12-16-3-3-2-925-2).

It should be noted that the proposed onsite substation will consist of a 33/132kV yard which will be owned and operated by Beaufort West Wind Farm (**the subject of this EMPr**), as well as a 132kV switching station yard which will be owned and operated by Eskom (**the subject of a separate standalone EMPr**). The 132kV switching station yard of the substation requires a separate Environmental Authorisation (EA) and is subject to a separate Basic Assessment (BA) process. The EA issued for the application for the 132kV powerline (**the subject of a separate standalone EMPr**) and switching substation will be transferred to Eskom. The 132kV switching station yard of the proposed onsite substation has therefore been included in a separate application, along with the 132kV overhead powerline (DFFE reference number to be allocated still), and is **the subject of a separate EMPr**.

Both above-mentioned Wind Farms were amended in 2020 to increase the turbine hub heights and increase the rotor diameters (Beaufort West Wind Farm –March 2020: DFFE REF: 12-12-20-1784-1-AM5 and Trakas Wind Farm – February 2020: DFFE REF: 12-12-20-1784-2-AM1). Further administrative amendments were granted to both respective Wind Farms in 2020 (Beaufort West Wind Farm – March 2020: DFFE REF: 12-12-20-1784-1-AM2 and Trakas Wind Farm – February 2020: DFFE REF: 12-12-20-1784-1-AM2) that included changing the holder of the Environmental Authorisations, adding Battery Energy Storage Facilities and amending project descriptions.

¹ Onsite substation will consist of 33/132kV yard which will be owned and operated by Beaufort West Wind Farm, as well as 132kV switching station yard which will be owned and operated by Eskom. A step-up transformer to 132kV will be situated within the substation owned by Beaufort West Wind Farm, with a 132kV line that will cross to Eskom's 132kV switching substation. **33/132kV yard of onsite substation and associated BESS, laydown area and O&M Building form part of this EMPr. 132kV yard of onsite switching substation forms part of separate standalone EMPr.**

The supporting powerlines, linking station and onsite substation infrastructure were authorised for both respective wind farms in January 2017 (DFFE REF:[14-12-16-3-3-2-925](#)). This authorisation was subsequently amended to split and assign each substation to each respective wind farm in August 2021 (Beaufort West 132KV-400KV Linking Station and onsite 132KV Substation – DFFE REF:[14-12-16-3-3-2-925-1](#) and Trakas 132KV-400KV Linking Station, 132KV Power Line and onsite 132KV Substation – DFFE REF:[14-12-16-3-3-2-925-2](#)).

As mentioned, the proposed substation, BESS, laydown area and O&M building (the subject of this EMPr) will service both of the authorised Beaufort West and Trakas Wind Farm projects and associated electrical infrastructure.

It should be noted that on 28 October 2021, the Minister of Mineral Resources and Energy announced the Preferred Bidders of the Round 5 Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) and both of the above-mentioned wind energy facilities received Preferred Bidder status i.e.:

- Beaufort West Wind Farm – [12-12-20-1784-1-AM2](#)
- Trakas Wind Farm - [12-12-20-1784-2-AM2](#)

These wind energy facilities have now become Strategic Infrastructure Projects (SIPs) (i.e., SIPs 8 and 10). SIPs 8 and 10 target the development of green energy in support of the South African economy and the provision of electricity transmission and distribution respectively:

- SIP 8 supports sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP, 2019) and support bio-fuel production facilities.
- SIP 10 aims to expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. It also aims to align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity

The proposed substation will have a capacity of 33/132kV and will occupy a footprint of up to approximately 2 hectares (ha). The substation will contain step-up transformers for voltage step up from low voltage (33kV) to medium voltage (132kV). Direct Current (DC) power from the authorised Beaufort West Wind Farm ([12-12-20-1784-1-AM2](#)) and Trakas Wind Farm ([12-12-20-1784-1-AM2](#)) will be converted into Alternating Current (AC) power in the inverters and the voltage will be stepped up to medium voltage in the inverter transformers. The step-up transformers to 132kV will be situated within the substation owned by Beaufort West Wind Farm (**the subject of this EMPr**), with a 132kV line that will cross to Eskom's 132kV switching substation (**part of separate standalone EMPr with DFFE reference number to be allocated still**).

A road (approx. 4-8m wide) will also be required in the servitude under the proposed powerline (**part of separate standalone EMPr with DFFE reference number to be allocated still**) and will run from the proposed onsite substation (**the subject of this EMPr**) to the authorised linking station ([14-12-16-3-3-2-925-1](#)).

A solid state (Lithium-ion) BESS will be required and will occupy an area of up to 4ha within the proposed substation footprint. The batteries will subsequently be used to store 'energy'. The

batteries to be used are already assembled prior to delivery and come as 'plug and play' modular units.

In addition to the above, a temporary area (of up to 7ha) within the site area will be required for the assembly and storage of the precast turbine structures. A permanent O&M building will also be required and will occupy a footprint of up to approximately 1.2ha.

The proposed onsite substation, BESS, laydown area and O&M building (**the subject of this EMPr**) will be located within the site proposed for the authorised Beaufort West Cluster (Beaufort West Wind farm - DFFE REF:[12-12-20-1784-1-AM2](#); Trakas Wind farm - DFFE REF:[12-12-20-1784-2-AM2](#); Beaufort West 132KV-400KV Linking Station, 132KV Power Line and onsite 132KV Substation – [14-12-16-3-3-2-925-1](#) & Trakas 132KV-400KV Linking Station, 132KV Power Line and onsite 132KV Substation – [14-12-16-3-3-2-925-2](#)), which is authorised on Portion 1 and Remainder of the Farm Trakaskuilen No. 15.

This Generic EMPr is applicable to the proposed construction and operation of the Beaufort West wind farm substation and associated infrastructure located within the substation footprint (i.e., BESS, laydown area, O&M building, temporary storage area and access road) near Beaufort West in the Prince Albert Local Municipality, within the Central Karoo District in the Western Cape Province.

7.1.5. Project Location

Location details of the proposed Beaufort West Wind Farm Substation and Associated Infrastructure development:

Province	Western Cape
District Municipality	Central Karoo District Municipality
Local Municipality	Prince Albert Local Municipality
Ward number(s)	Ward 2
Nearest town(s)	Beaufort West
Affected Properties: Farm name(s), number(s) and portion numbers	» Remainder of the Farm Trakaskuilen No. 15
SG 21 Digit Code (s)	» C06100000000015000010
Current zoning and land use	Agriculture

7.1.6. Preliminary Technical Specifications of the proposed Beaufort West Wind Farm Substation and Associated Infrastructure development

Infrastructure	Footprint, dimensions and technical details
On-site Substation	<ul style="list-style-type: none"> • One (1) new substation with capacity of 33kV/132kV • Total footprint of up to approx. 2ha • Will contain transformers for voltage step up from low voltage (33kV) to medium voltage (132kV) • Onsite substation will consist of a 33/132kV yard which will be owned and operated by Beaufort West Wind Farm (the subject of this EMPr), as well as a 132kV switching station yard which will be owned and operated by Eskom (the subject of a separate standalone EMPr)

Infrastructure	Footprint, dimensions and technical details
	<ul style="list-style-type: none"> • Step-up transformer to 132kV will be situated within substation owned by Beaufort West Wind Farm (33/132kV yard), with 132kV line that will cross to Eskom's 132kV switching substation. • Two (2) substation alternatives are being considered and assessed
Battery Energy Storage System (BESS)	<ul style="list-style-type: none"> • One (1) BESS with total footprint of up to approx. 4ha • Type of technology will be solid state, Lithium-ion • Batteries will be used to store 'energy' • Batteries to be used are already assembled prior to delivery and come as 'plug and play' modular units
Roads	<ul style="list-style-type: none"> • One (1) new road will be required • Width of up to approx. 4-8m wide • Will run from proposed onsite substation (the subject of this EMPr) to authorised linking station (<u>14-12-16-3-3-2-925-1</u>).
Temporary Assembly & Storage Area	<ul style="list-style-type: none"> • A temporary area will be required for assembly and storage of precast turbine structures • Will require an area of up to 7ha
Permanent Operations and Maintenance (O&M) Building	<ul style="list-style-type: none"> • One (1) permanent O&M building will be required • Will occupy a footprint of up to approx. 1,2ha

It should be noted that Eskom's requirements for work in or near Eskom servitudes should be adhered to (to be attached as Appendix 4 to EMPr once obtained).

7.2. Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features within 50 m from the development footprint.

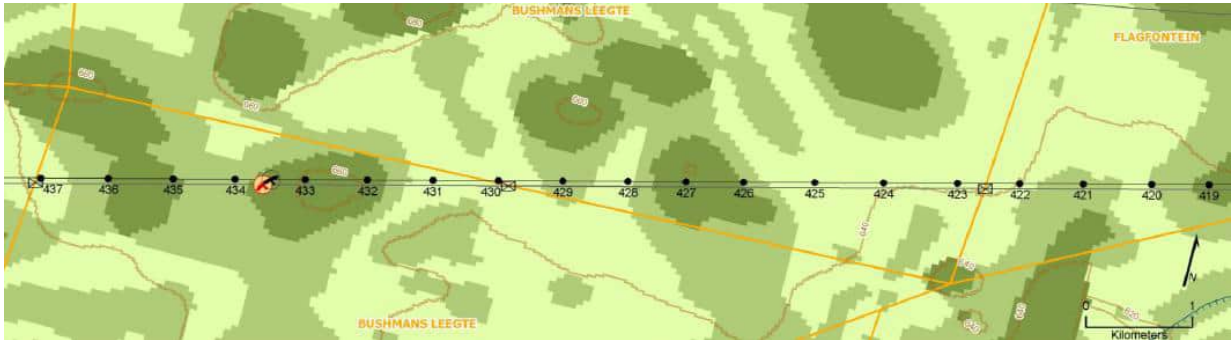


Figure 1: Example of an environmental sensitivity map in the context of a final overhead transmission and distribution profile

The national web-based environmental screening tool was utilised for this project and the sensitivity maps can be seen in Figures 4 to 10. The site-specific environmental sensitivity map included in the BA Report is included as Figure 2.

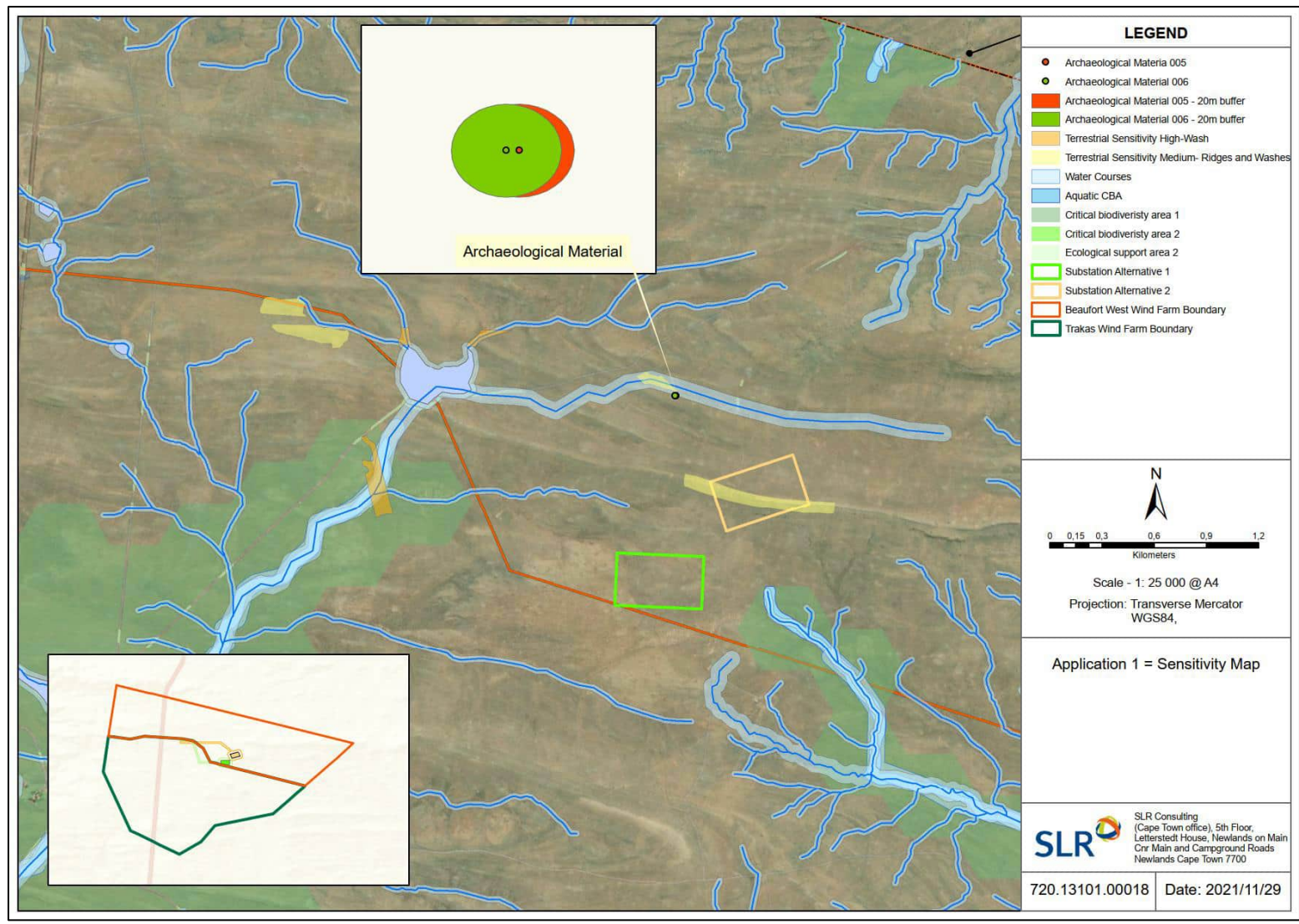


Figure 2: Environmental sensitivity map as per the Basic Assessment process undertaken for the proposed Substation and associated infrastructure associated with the authorised Beaufort West and Trakas Wind Farm Projects

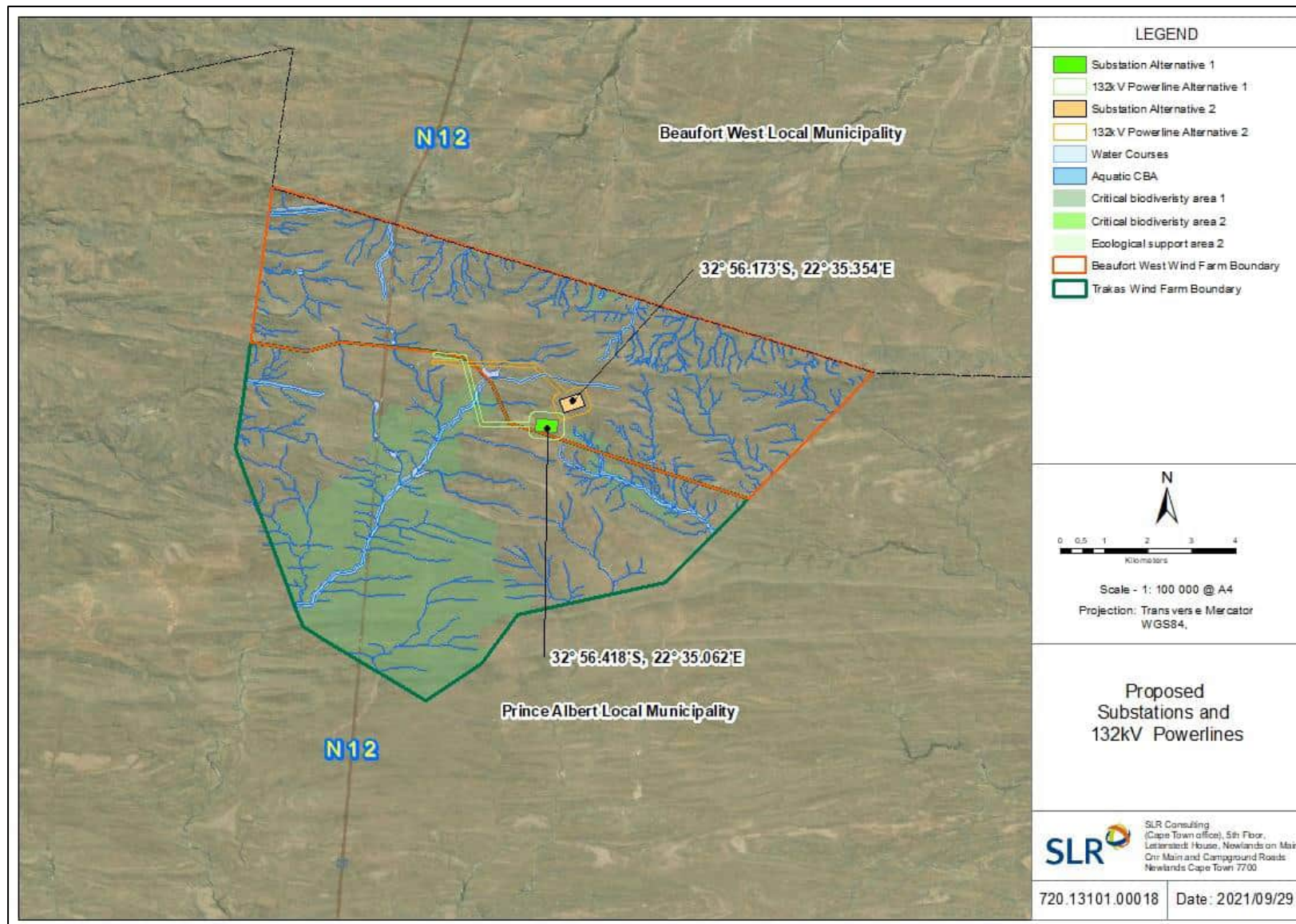
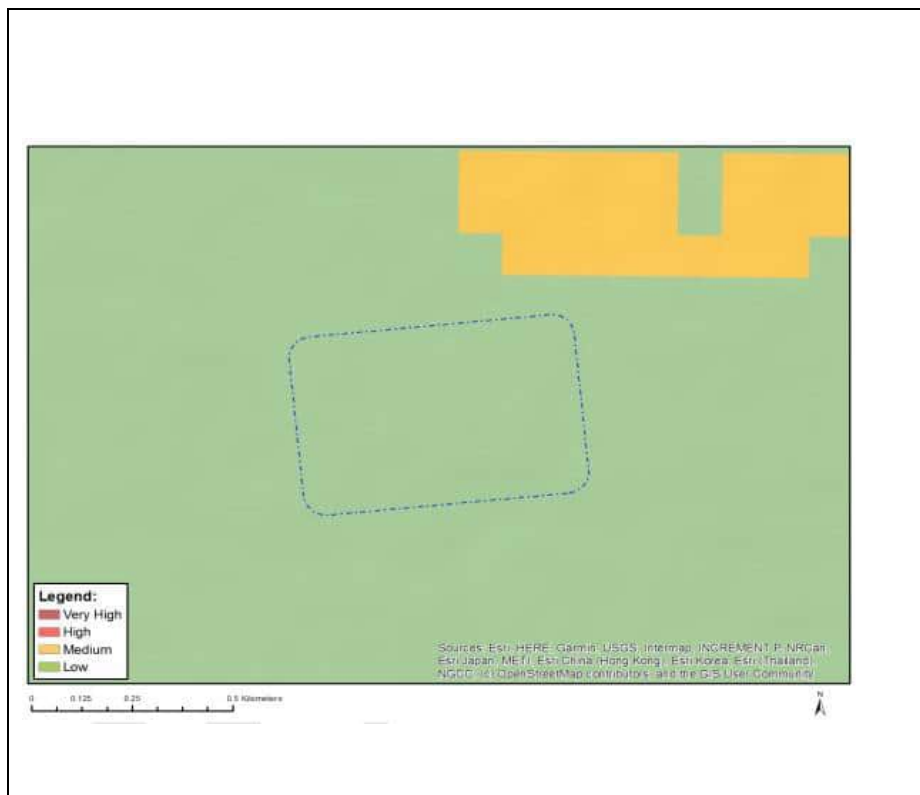
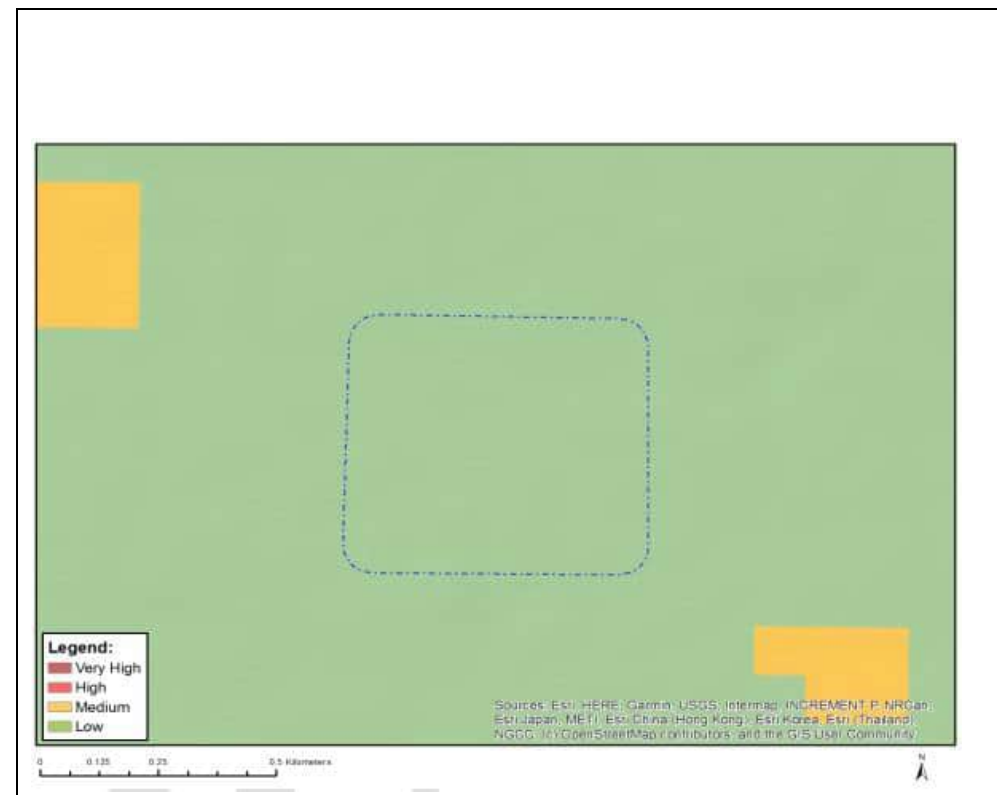


Figure 3: Layout map for the proposed Substation associated with the authorised Beaufort West Grid Infrastructure



IPP Substation Alternative 1

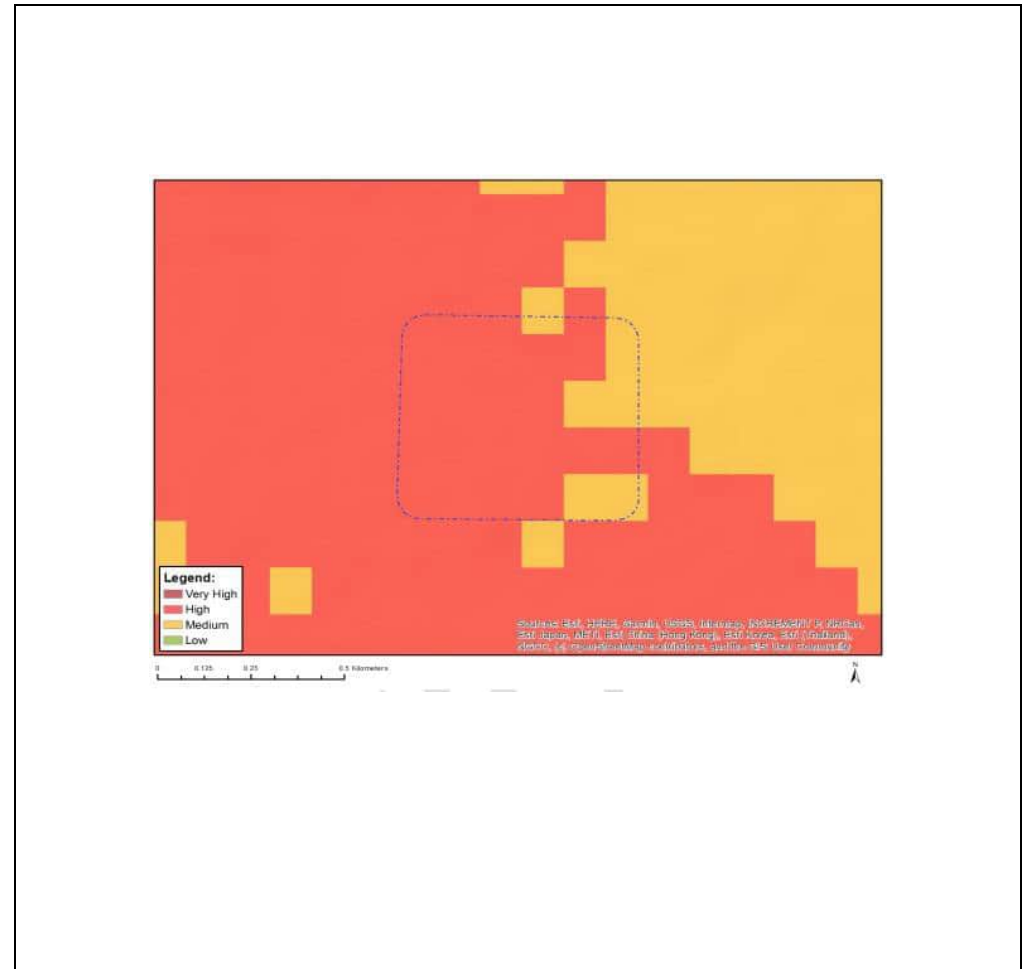


IPP Substation Alternative 2

Figure 4: Map of Relative Agriculture Theme Sensitivity – Low



IPP Substation Alternative 1



IPP Substation Alternative 2

Figure 5: Map of Animal Species Theme Sensitivity – Medium / High

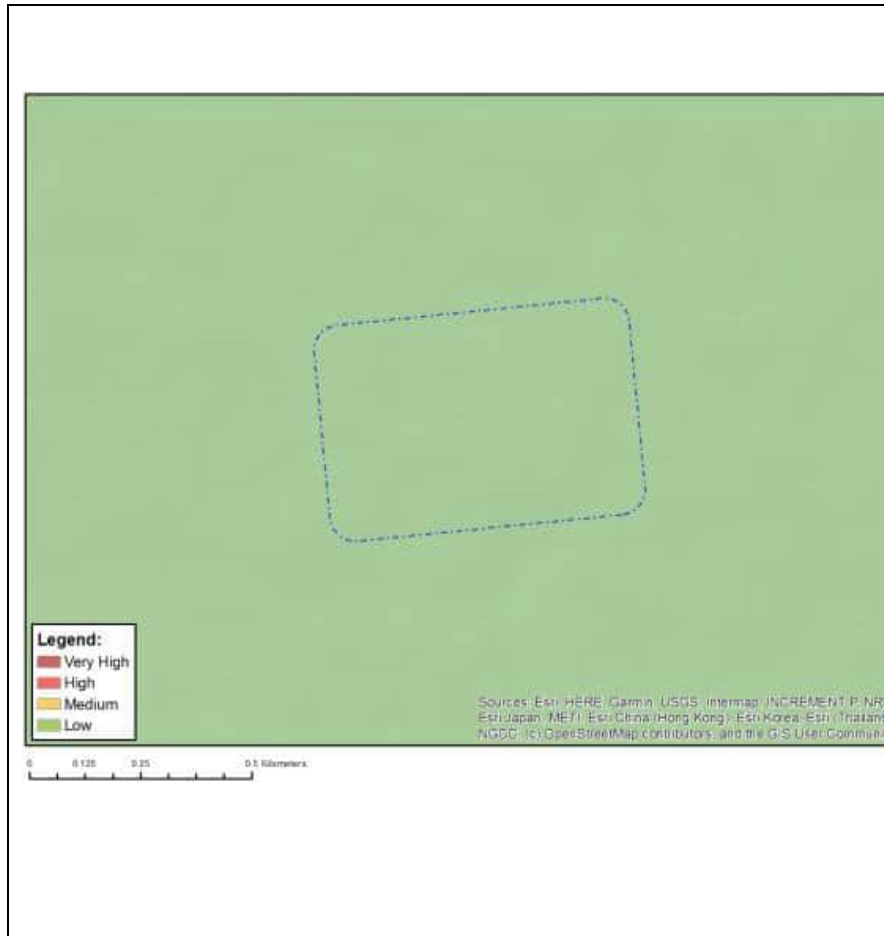


IPP Substation Alternative 1

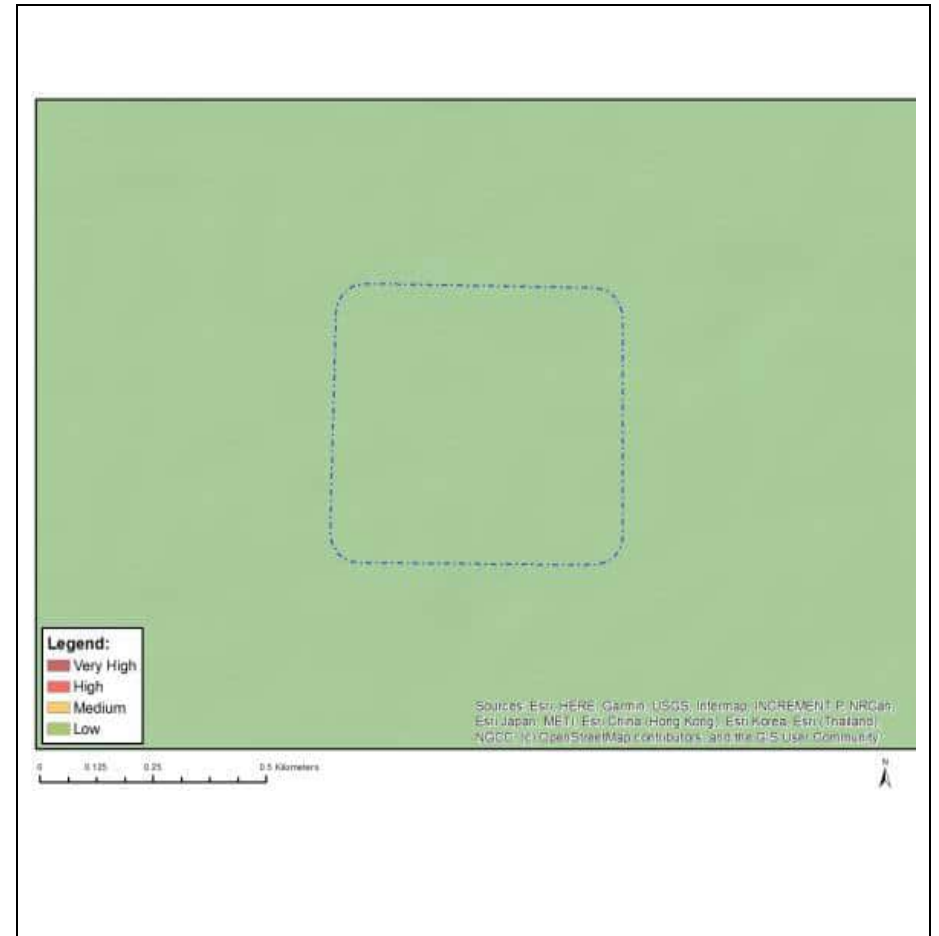


IPP Substation Alternative 2

Figure 6: Map of Aquatic Biodiversity Theme Sensitivity – Low

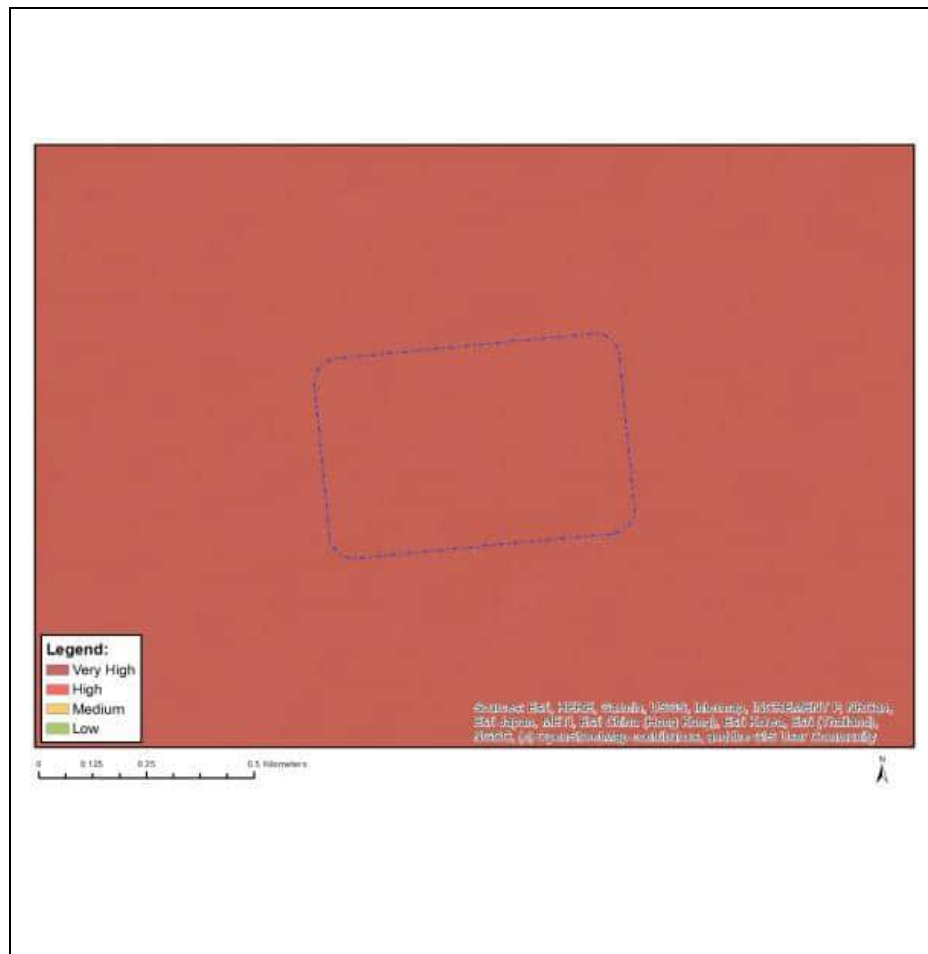


IPP Substation Alternative 1

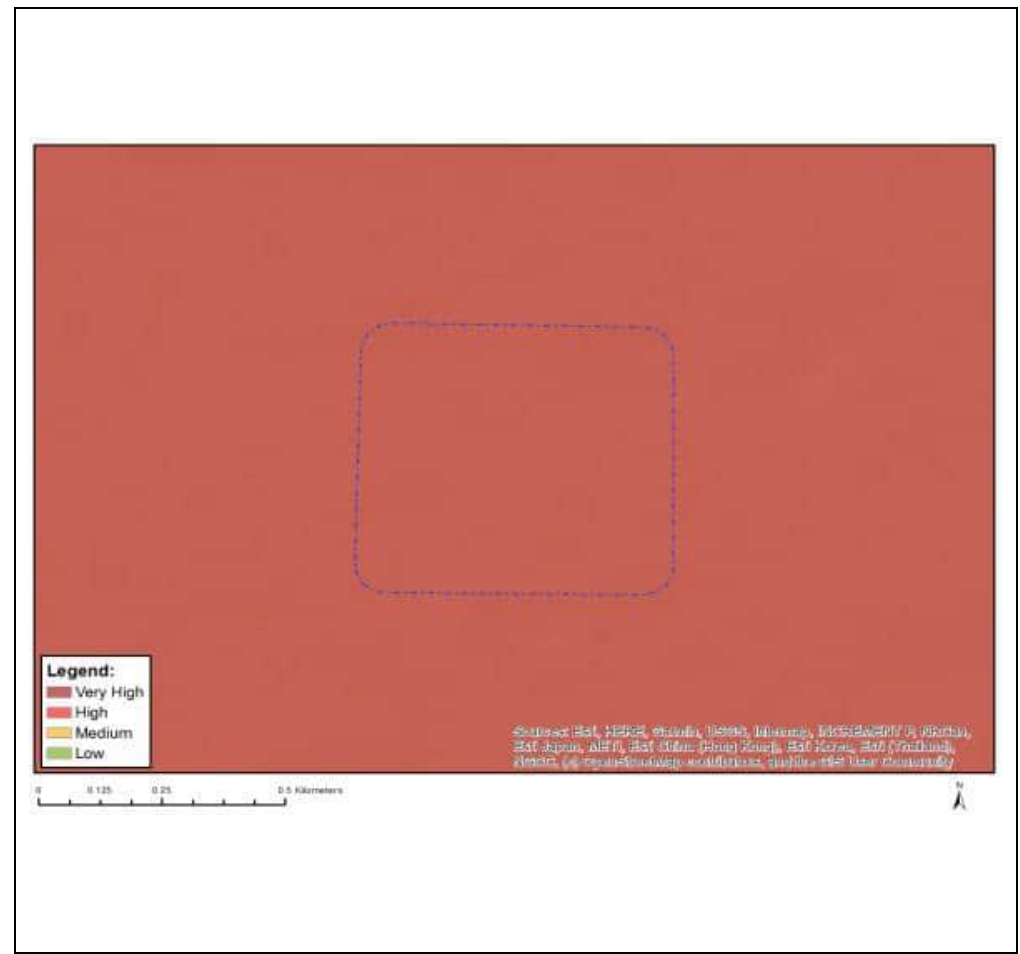


IPP Substation Alternative 2

Figure 7: Map of Archaeological and Cultural Heritage Species Theme Sensitivity – Low

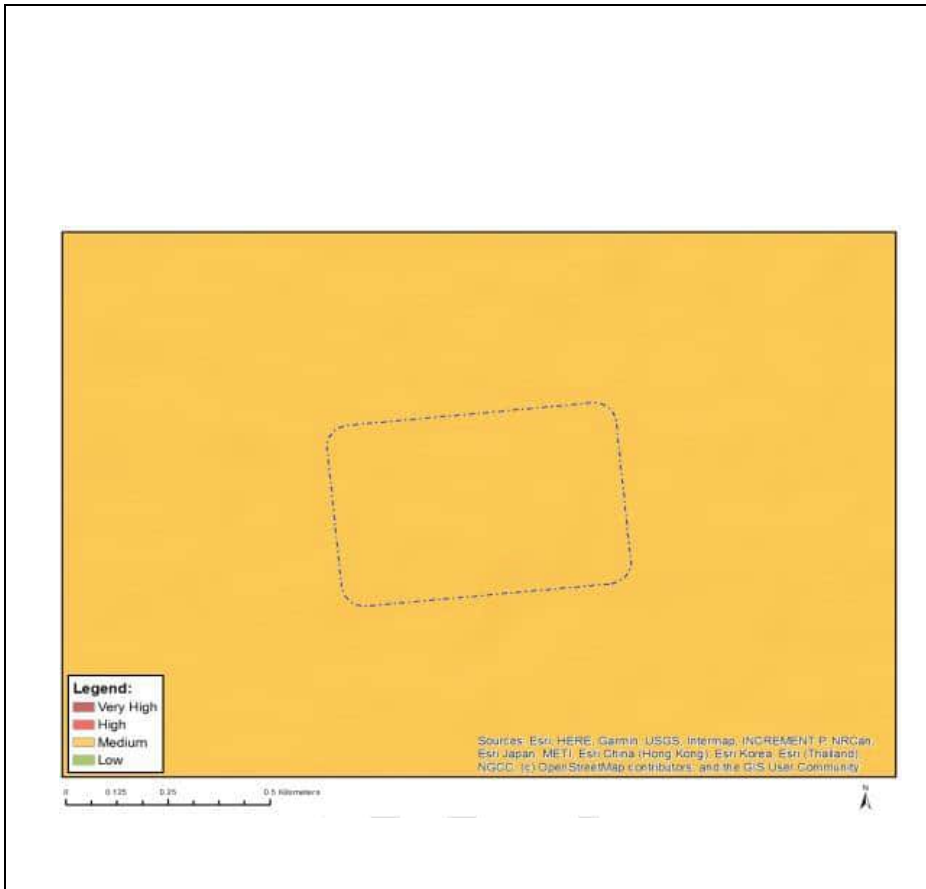


IPP Substation Alternative 1

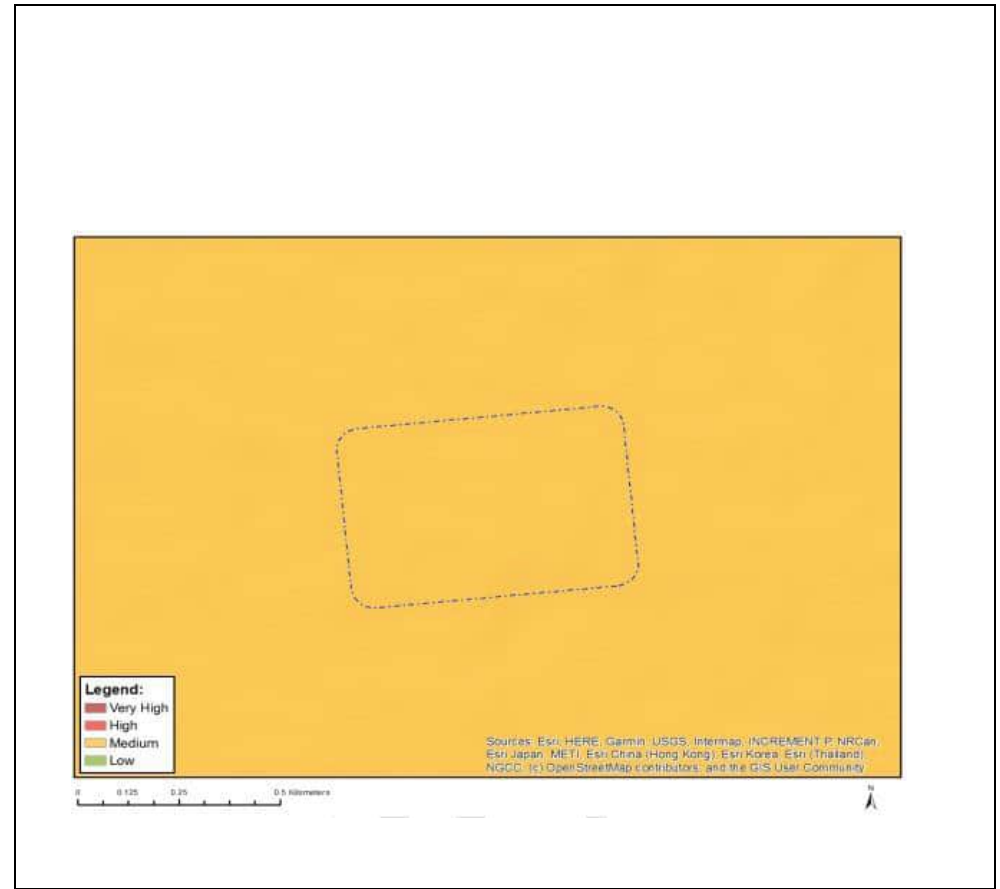


IPP Substation Alternative 2

Figure 8: Map of Relative Palaeontology Theme Sensitivity – Very High

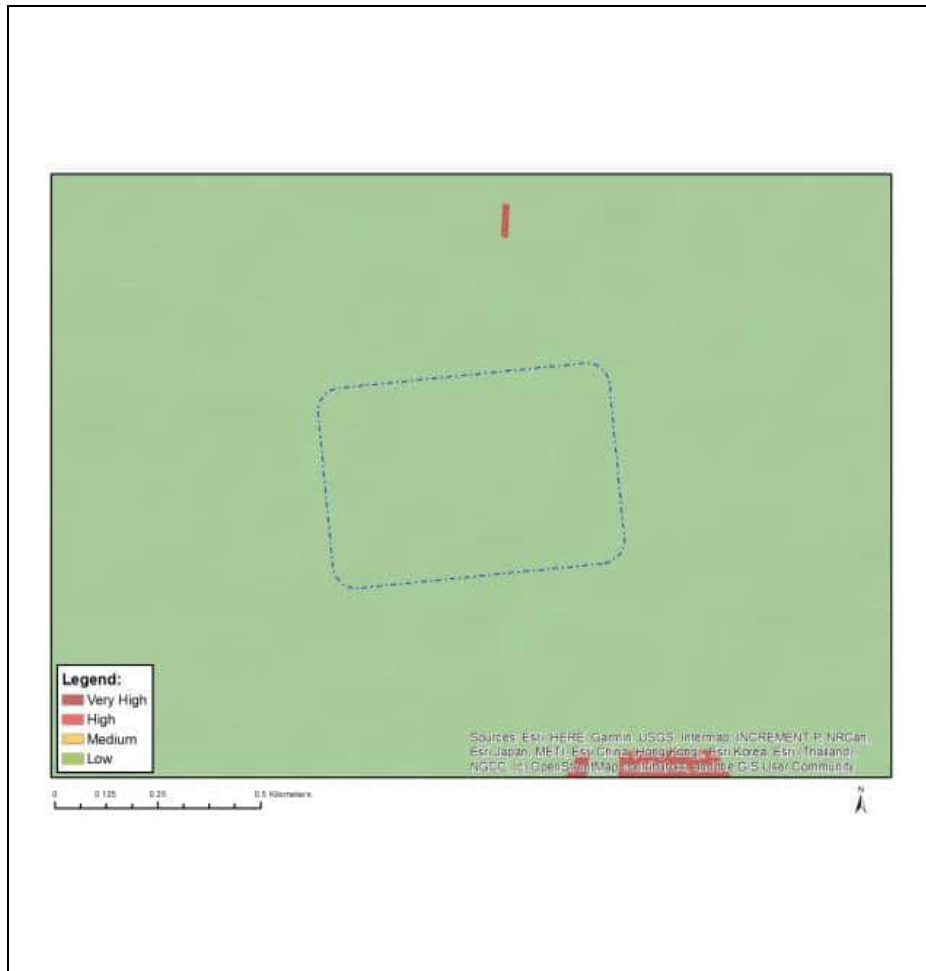


IPP Substation Alternative 1

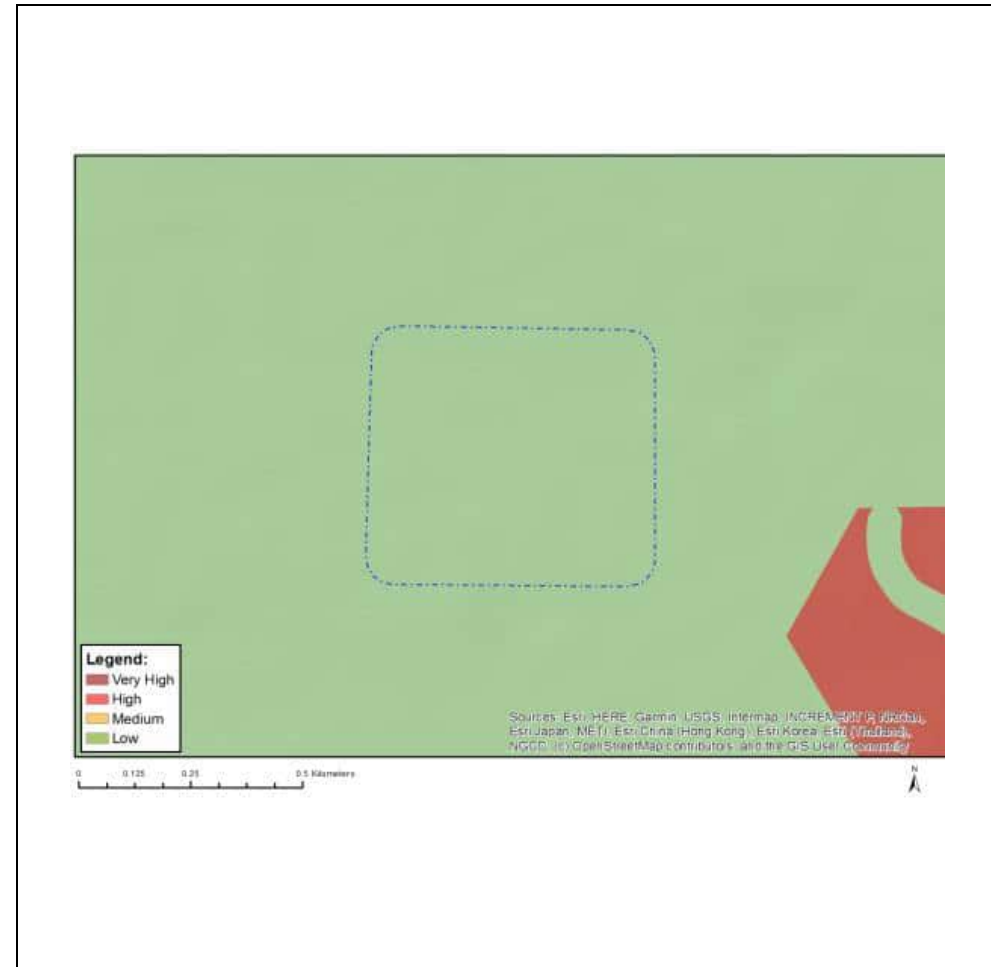


IPP Substation Alternative 2

Figure 9: Map of Relative Plant Species Theme Sensitivity - Medium



IPP Substation Alternative 1



IPP Substation Alternative 2

Figure 10: Map of Relative Terrestrial Biodiversity Theme Sensitivity - Low

7.3 Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence or commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA

Date:

This declaration will be signed by the proponent/applicant/holder of the EA once the contractor is appointed and has provided inputs to this Generic EMPr as per the requirements of this template.

7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART C

8. SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

8.1 Fauna and Flora (Terrestrial Ecology) impacts

Impact management outcome: Potential impact on fauna and flora of the proposed infrastructure						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Pre-Construction, Construction & Decommissioning Phase						
- Minimise vegetation clearing for access roads, substation areas and other infrastructure to reduce impact on vegetation and protected plant species.	Project Manager/ECO	1) Pre-construction walk-through of the approved development footprint to micro-site infrastructure such as access roads and to ensure that sensitive habitats and species are avoided, where possible.	Pre-construction & construction phase	ECO	Before commencement and during construction phase	Records of monitoring and adherence to implementations methods and mitigation measures
- Minimise increased levels of noise, pollution, disturbance and human presence during construction and decommissioning.	Project Manager/ECO	1) During construction, any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.	Pre-construction, construction & decommissioning phase	ECO	Before commencement and during construction phase	Records of monitoring and adherence to implementations methods and mitigation measures

		<p>2) No fuelwood collection should be allowed on-site.</p> <p>3) If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects, and which should be directed downwards.</p> <p>4) Any trenches present should have occasional soil ramps present to allow fauna to escape while open holes should be inspected at least every second day to check for trapped fauna.</p>				
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<p>- Limit disturbance of vegetation and loss of protected flora during construction.</p>	<p>Project Manager/ECO</p>	<p>1) Obtain relevant permits from the CapeNature prior to any construction activities at the site.</p> <p>2) Affected individuals of selected protected species which cannot be avoided should be translocated to a safe area on the site prior to construction.</p>	<p>Construction phase</p>	<p>ECO</p>	<p>Ongoing</p>	<p>Vegetation loss restricted to infrastructure footprint</p> <p>Low impact on protected plant species.</p> <p>Permit obtained to destroy or translocate affected individuals of protected species</p> <p>Records of monitoring and adherence to implementations methods and mitigation measures</p>
<p>- Limit direct and indirect terrestrial faunal impacts during construction.</p>	<p>Project Manager/ECO</p>	<p>1) Any fauna encountered during construction should be allowed to passively vacate the area.</p>	<p>Construction phase</p>	<p>ECO</p>	<p>Ongoing</p>	<p>Low mortality of fauna due to construction machinery and activities.</p> <p>No poaching etc of fauna by</p>

		3) All vehicles to adhere to low-speed limits (40km/h max for light vehicles and 30km/h max for heavy vehicles) on the site, to reduce risk of faunal collisions as well as reduce dust.				<p>construction personnel during construction.</p> <p>Removal to safety of fauna encountered during construction.</p> <p>Records of monitoring and adherence to implementations methods and mitigation measures.</p> <p>All incidents to be noted.</p>
Operational Phase						
- Reduce disturbance or persecution of fauna within or adjacent to the facility as a result of the operation and presence of the substation and associated infrastructure.	Project Manager/ECO	1) Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location.	Operational phase	ECO	Ongoing	Records of monitoring and adherence to implementations methods and mitigation measures

		<p>2) If the substation or other parts of the site must be lit at night for security purposes, this should be done with downward-directed low-Ultraviolet (UV) type lights (such as most LEDs), which do not attract insects.</p> <p>3) All vehicles accessing the site should adhere to a low-speed limit (30km/h max for heavy vehicles and 40km/h max for light vehicles) to avoid collisions with susceptible species such as snakes and tortoises.</p> <p>4) If the substation area is to be fenced, then no electrified strands should be placed within 30cm of the ground. Alternatively, the</p>				
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		electrified strands should be placed on the inside of the fence and not the outside.				
- Reduce the cumulative habitat loss within CBAs and impacts on broad-scale ecological processes such as fragmentation.	Project Manager/ECO	<p>1) All disturbed areas that are not used such as excess road widths, should be rehabilitated with locally occurring shrubs and grasses after construction to reduce the overall footprint of the development.</p> <p>2) Noise and disturbance on the site should be kept to a minimum during operation and maintenance activities.</p> <p>3) All erosion and alien management plans must be effectively implemented at the site.</p>	Operational phase	ECO	Ongoing	Records of monitoring and adherence to implementations methods and mitigation measures

<p>- Control of erosion and alien plant invasion during operation phase.</p>	<p>Project Manager/ECO</p>	<p>1) Erosion management within the development area should take place according to the Erosion Management Plan and Rehabilitation Plan.</p> <p>2) Access roads should have run-off control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</p> <p>3) Regular monitoring for erosion during operation to ensure that no erosion problems have developed as a result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project.</p>	<p>Operational & Decommissioning phase</p>	<p>ECO</p>	<p>Ongoing</p>	<p>Records of monitoring and adherence to implementations methods and mitigation measures</p>
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		<p>4) All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</p> <p>5) There should be follow-up rehabilitation and re-vegetation of any remaining bare areas with indigenous perennial shrubs and succulents from the local area.</p> <p>6) Alien management at the site should take place in accordance with the Alien Invasive Management Plan.</p> <p>7) Regular monitoring for alien plant proliferation during the operation phase to</p>				
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		<p>ensure that no erosion problems have developed as result of the disturbance, as per the Alien Management Plan for the project.</p> <p>8) Woody alien plant species should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.</p>				
- Limit the ecological footprint of the development.	Project Manager/ECO	<p>1) Vegetation control should be by manual clearing and herbicides should not be used except to control alien plants in the prescribed manner.</p> <p>2) Annual monitoring for alien plant species - with follow up clearing as needed – or as</p>	Operational phase	ECO	Ongoing	<p>No erosion problems at the site.</p> <p>Low abundance of alien plants.</p> <p>Annual monitoring with records of alien species presence and clearing actions.</p>

		<p>per the frequency stated in the alien invasive management plan to be developed for the site</p> <p>3) Annual site inspection for erosion or water flow regulation problems – with follow up remedial action where problems are identified.</p>				<p>Annual monitoring with records of erosion problems and mitigation actions taken with photographs.</p> <p>Records of monitoring and adherence to implementations methods and mitigation measures</p>
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8.2 Aquatic Ecology Impacts

Impact management outcome: Potential impact on aquatic ecology as a result of the proposed infrastructure						
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Construction & Decommissioning Phase						
- Minimise potential loss of protected or listed aquatic species	Project Manager/ECO	1) A final site walkdown must be conducted after the site is approved, particularly after some rainfall has occurred (October 2021) and going into the remainder of the growth season some plants may become evident	Construction & Decommissioning phase	ECO	Ongoing	Area inspected by ECO / ESO on a regular basis (weekly) for any unique plants (mostly bulbs and succulents) that may appear during the growth seasons Records of walkthrough reports and compliance with various plans and reports as per ECO reports
- Minimise damage or loss of riparian systems and disturbance of waterbodies in the construction / decommissioning phase	Project Manager/ECO	1) A pre-construction walkthrough with an aquatic specialist is recommended. They can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to	Construction & Decommissioning phase	ECO	Ongoing	Records of walkthrough reports and compliance with various plans and reports as per ECO reports

		<p>micro-siting of the final layout.</p> <p>2) Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc).</p>				
- Minimise potential impacts on localises surface water quality	Project Manager/ECO	<p>1) Mechanical plant and bowsers must not be refuelled or serviced within 100m of a river channel.</p> <p>2) All construction camps, laydown areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses. Note comment regards Camp A that requires micro-siting.</p>	Construction & Decommissioning phase	ECO	Ongoing	<p>ECO / ESO monitors site on a daily basis to ensure plant is in working order (minimise leaks)</p> <p>Evidence that spills have been prevented and if they do occur, have been quickly rectified</p> <p>Records of walkthrough reports and compliance with various plans</p>

						and reports as per ECO reports
Operational Phase						
- Minimise changes to hydrological regimes that could also lead to sedimentation and erosion	Project Manager/ECO	1) A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil.	Before commencement and throughout the operational phase of the project.	ECO	Ongoing	Records / evidence of stormwater control systems being inspected on an annual basis to ensure these are functional The stormwater control systems must be inspected throughout project duration and on an annual basis afterwards to ensure these are functional

8.3 Visual Impacts

Impact management outcome: Reduce visual impacts associated with the IPP portion of the substation (namely the 33/132kV portion)						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Construction, Operational and Decommissioning Phases						
- Reduce visual impacts as a result of preparatory works & construction concerns	Project Manager / dEO	1) Ensure, wherever possible, natural indigenous vegetation is retained and incorporated into the site rehabilitation	Construction, Operational & Decommissioning phases	ECO	Once, before the commencement and any other relevant period during construction,	Evidence that natural indigenous vegetation has been retained and incorporated into the site rehabilitation (where required)

					operation and decommissioning	Evidence that responsible construction practices have been adopted and that the construction/establishment activities have been contained to specifically demarcated areas Records of monitoring and adherence to implementations methods and mitigation measures
- Reduce visual impact as a result of earthworks	Project Manager / dEO	1) All cut and fill slopes (if any) and areas affected by construction work should be progressively top soiled and re-vegetated as soon as possible.	Construction, Operational & Decommissioning phases	ECO	Once, before the commencement and any other relevant period during construction, operation and decommissioning	Evidence that all cut-and-fill slopes (if any) and areas affected by construction work have been top soiled and re-vegetated in the appropriate manner as soon as possible (where required) Records of monitoring and adherence to implementations methods and mitigation measures
- Reduce visual impact by using ecological approach	Project Manager / dEO	1) Where new vegetation is proposed to be introduced to the site, an ecological approach to rehabilitation, as opposed to a horticultural	Construction, Operational & Decommissioning phases	ECO	Once, before the commencement and any other relevant period during construction,	Records (photographic) of implementation of the ecological approach, where new vegetation has been introduced

		<p>approach, should be adopted. For example, communities of indigenous plants will enhance biodiversity, a desirable outcome for the area.</p> <p>2) Progressive rehabilitation of all construction areas should be carried out immediately after they have been established</p>			operation and decommissioning	<p>Proof of progressive rehabilitation</p> <p>Records of monitoring and adherence to implementations methods and mitigation measures</p>
- Reduce visual impact as a result of paint colours used for structures	Project Manager / dEO	1) Paint the structures with colours that reflect and compliment the colours of the surrounding landscape (where possible).	Before and during construction, operation and decommissioning	ECO	Once, before the commencement and any other relevant period during construction, operation and decommissioning	<p>Photographic evidence that the structures have been painted as prescribed.</p> <p>Records of monitoring and adherence to implementations methods and mitigation measures</p>
- Reduce visual impact as a result of light pollution (such as light spillage)	Project Manager / dEO	1) Install light fixtures that provide precisely directed illumination, to reduce light "spillage" beyond the immediate surrounds of the sites that may require security lighting i.e. lights (spotlights) are to be aimed away from the	Before and during construction, operation and decommissioning	ECO	Once, before the commencement and any other relevant period during construction, operation and decommissioning	<p>Photographic evidence that lighting specifications and placement are done according to prescription and monitored periodically for compliance.</p> <p>Records of monitoring and adherence to</p>

		<p>main roads and the nearby farmsteads.</p> <p>2) Avoid high pole top security lighting and use only lights that are activated on illegal entry to the site.</p> <p>3) Minimise the number of light fixtures to the bare minimum, including security lighting.</p>				<p>implementations methods and mitigation measures</p>
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8.4 Avifaunal Impacts

Impact management outcome: Reduce potential impact on avifauna						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Operational Phase						
- Minimise impacts to avifauna as a result of electrocutions within the substation yard	Project Manager/ ECO	1) The hardware within the proposed transmission substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation (insulation) be applied reactively.	During operational phase, for duration of project lifecycle	ECO	Ongoing (Monthly) during the operational phase	Record and monitor ongoing impacts within ECO reports.

Please refer to the tables below for key mitigation and monitoring recommendations for each applicable mitigation measure identified in the EMPr (Appendix 5 of Avifauna Report).

Management Plan for Construction Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Avifauna: Displacement due to disturbance					
The noise and movement associated with the construction activities at the development footprint will be a source of disturbance which would lead to the displacement of avifauna from the area	Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr)	<p>A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr must specifically include the following:</p> <ol style="list-style-type: none"> 1. No off-road driving; 2. Maximum use of existing roads, where possible; 3. Measures to control noise and dust according to latest best practice; 4. Restricted access to the rest of the property; 5. Strict application of all recommendations in the biodiversity specialist report pertaining to the limitation of the footprint. 	<ol style="list-style-type: none"> 1. Implementation of the CEMPr. Oversee activities to ensure that the CEMPr is implemented and enforced via site audits and inspections. Report and record any non-compliance. 2. Ensure that construction personnel are made aware of the impacts relating to off-road driving. 3. Construction access roads must be demarcated clearly. Undertake site inspections to verify. 4. Monitor the implementation of noise control mechanisms via site inspections and record and report non-compliance. 5. Ensure that the construction area is demarcated clearly and that construction personnel are made aware of these demarcations. Monitor via site inspections and report non-compliance. 	<ol style="list-style-type: none"> 1. On a daily basis 2. Weekly 3. Weekly 4. Weekly 5. Weekly 	<ol style="list-style-type: none"> 1. Contractor and ECO 2. Contractor and ECO 3. Contractor and ECO 4. Contractor and ECO 5. Contractor and ECO

Management Plan for Operational Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Avifauna: Displacement due to habitat transformation in the substations					
Total or partial displacement of avifauna due to habitat transformation associated with the vegetation clearance in the onsite substations.	Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented where possible by an appropriately qualified rehabilitation specialist, according to the recommendations of the botanical specialist study.	<ol style="list-style-type: none"> 1. Develop a Habitat Restoration Plan (HRP) and ensure that it is approved. 2. Monitor rehabilitation via site audits and site inspections to ensure compliance. Record and report any non-compliance. 	<ol style="list-style-type: none"> 1. Appointment of rehabilitation specialist to develop HRP. 2. Site inspections to monitor progress of HRP. 3. Adaptive management to ensure HRP goals are met. 	<ol style="list-style-type: none"> 1. Once-off 2. Once a year 3. As and when required 	<ol style="list-style-type: none"> 1. Facility operator
Avifauna: Mortality of avifauna due to electrocution in the onsite substations					
Mortality of avifauna due to electrocutions in the substations	Reduction of avian electrocution mortality	<ol style="list-style-type: none"> 1. Monitor the electrocution mortality in the substations. 2. Apply mitigation when and if required. 	<ol style="list-style-type: none"> 1. Regular inspections of the substation yard 	<ol style="list-style-type: none"> 1. Weekly 	<ol style="list-style-type: none"> 1. Facility operator

Management Plan for Decommissioning Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Avifauna: Displacement due to disturbance					
The noise and movement associated with the decommissioning activities will be a source of disturbance which would lead to the displacement of avifauna from the area	Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Decommissioning EMP (DEMPr).	A site-specific DEMPr must be implemented, which gives appropriate and detailed description of how activities must be conducted. All contractors are to adhere to the DEMPr and should apply good environmental practice during decommissioning. The DEMPr must specifically include the following:	<ol style="list-style-type: none"> 1. Implementation of the DEMPr. Oversee activities to ensure that the DEMPr is implemented and enforced via site audits and inspections. Report and record any non-compliance. 2. Ensure that decommissioning 	<ol style="list-style-type: none"> 1. On a daily basis 2. Weekly 3. Weekly 4. Weekly 5. Weekly 	<ol style="list-style-type: none"> 1. Contractor and ECO 2. Contractor and ECO 3. Contractor and ECO 4. Contractor and ECO 5. Contractor and ECO

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<ol style="list-style-type: none"> 1. No off-road driving; 2. Maximum use of existing roads during the decommissioning phase and the construction of new roads should be kept to a minimum as far as practical; 3. Measures to control noise and dust according to latest best practice; 4. Restricted access to the rest of the property; 5. Strict application of all recommendations in the botanical specialist report pertaining to the limitation of the footprint. 	<ol style="list-style-type: none"> personnel are made aware of the impacts relating to off-road driving. 3. Access roads must be demarcated clearly. Undertake site inspections to verify. 4. Monitor the implementation of noise control mechanisms via site inspections and record and report non-compliance. 5. Ensure that the decommissioning area is demarcated clearly and that personnel are made aware of these demarcations. Monitor via site inspections and report non-compliance. 		

8.5 Archaeological, Heritage and Palaeontological Impacts (including Cultural Landscape)

Impact management outcome: Reduce potential impact on archaeological, heritage and paleontological resources						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Construction Phase						
- Reduce and/or prevent palaeontological related impacts	Project Manager/ ECO	<p>1) The ECO / ESO responsible for the developments should be made aware of the possibility of important fossil remains (vertebrate bones, teeth, petrified wood, plant-rich horizons etc.) being found or unearthed during the construction phase. Monitoring for fossil material of all major surface clearance (including access roads) and deeper (>1m) excavations by the ESO on an on-going basis during the construction phase is therefore recommended.</p> <p>2) Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape for recording and sampling by a professional palaeontologist (Contact details: Heritage Western Cape. 3rd Floor Protea Assurance Building, 142 Longmarket Street, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 021 483 5959 Email: ceoheritage@westerncape.gov.za).</p> <p>3) Palaeontological chance finds procedure must be incorporated into the EMPr. A tabulated Chance Fossil Finds Protocol is appended to the EMPr (Appendix 3)</p>	Construction phase	ECO/Project Manager	Ongoing (Monthly)	Sites monitored and avoided as prescribed and reported on in audit reports.

<p>- Reduce and/or prevent destruction of Pre-Colonial and Colonial Archaeological sites and Graves.</p>	<p>Project Manager/ ECO</p>	<p>1) No mitigation is required for "Not Conservation Worthy" (NCW) sites.</p> <p>2) Site 005/006, graded IIIIC, should be avoided and a 20m buffer implemented around the site.</p> <p>3) If any archaeological material is uncovered during the course of the development, then work must stop in the immediate area. The find must be reported to the Heritage Western Cape and may require inspection by an archaeologist. The find may require archaeological excavation and curation in an approved institution.</p> <p>4) If any unmarked graves are uncovered, HWC must be alerted immediately as per Section 36(6) of the NHRA. A professional archaeologist must be contacted as soon as possible to inspect the findings</p>	<p>Construction phase</p>	<p>ECO/Project Manager</p>	<p>Ongoing (Monthly)</p>	<p>Sites monitored and avoided as prescribed and reported on in audit reports.</p>
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8.6 Agricultural and Soils Impacts

There are no additional mitigation measures required, over and above what has already been included in the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, as per Government Notice 435 which was published in Government Gazette 42323 on 22 March 2019.

8.7 Reptile (specifically Karoo Dwarf Tortoise) Impact

Specialist has confirmed that there are no specific mitigation measures are proposed in terms of safeguarding Karoo Dwarf Tortoises.

Eskom's requirements for work in or near Eskom servitudes

It should be noted that Eskom's requirements for work in or near Eskom servitudes should be strictly adhered to, where required (to be attached to EMPr once obtained).

APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

APPENDIX 2: CURRICULA VITAE

CURRICULUM VITAE



STUART HEATHER-CLARK

TECHNICAL DIRECTOR
AFRICA POWER SECTOR LEAD

Environmental Management Planning & Approvals,
Africa

QUALIFICATIONS

Masters	1996	Environmental Science
BSc (Hons)	1992	Civil Engineering

EXPERTISE

- Environmental and Social Impact Assessment
- Environmental Management Plans/Programmes
- Public Participation & Facilitation
- Environmental & Social Due Diligence
- Environmental & Social Screening & Site Selection
- Training and Capacity Building
- Strategic Environmental Assessment

Stuart has over 24 years of environmental and social consulting experience in Africa. Having worked on over 100 development projects in Africa, his key strength is identifying and managing ESG risks for major capital projects from the concept phase through to the pre-feasibility, feasibility and implementation phases.

Through leading Environmental & Social Screening Studies, Environmental & Social Impact Assessments and Environmental & Social Due Diligences for major capital project in over 13 African countries; Stuart has developed a deep appreciation of key sustainability challenges facing development in Africa. He has excellent project management skills with the ability to manage projects from the concept phase through to project completion.

Stuart has worked for and with a number of IFI's, DFI's and PE firms to identify and managing ESG risks of their investments in Africa. He has an integral knowledge of the Equator Principles and IFC Performance Standards and understands the expectations of lenders and financial institutions when it comes to managing ESG risks.

Stuart has worked across various sectors including O&G, mining, infrastructure and power. Over the past eight years he has focussed on the power sector leading projects for wind farms, solar PV plants, hydropower plants and gas to power plants. He has an integral understanding of the Independent Power Producers (IPP) process in South Africa and several other African countries.

PROJECTS

All projects

Environmental and Social Impact Assessment for a 20MW solar PV plant and transmission line, Gigawatt Global, Liberia, (2020)

Project Director for the ESIA a 20MW solar PV plant and associated transmission line. The ESIA includes biodiversity, social and heritage baseline studies, stakeholder engagement and compilation of an ESIA Report and ESMP. The ESIA will be aligned with the IFC Performance Standards.

ESIA for an 80-200 MW wind farm development, Mphepo Power, Zambia (2019-20)

Project Director for the ESIA for the development of a wind farm in Zambia. The ESIA included terrestrial and aquatic, social, heritage, noise and visual baseline studies, stakeholder engagement and compilation of an ESIA Report and ESMP. The ESIA was aligned with the IFC Performance Standards.

<p>Environmental and Social Impact Assessment for a Road Upgrade, QGMI, Ghana, (2019-20)</p>	<p>Project Director for the Scoping Phase of the Environmental and Social Impact Assessment process for the proposed Winneba Obetsebi-Lamptey Flyover (Phase 2) project in Accra, Ghana in collaboration with local consultants. The project included additional visual impact assessment, air quality modelling and noise modelling. All work undertaken to IFC Performance Standards.</p>
<p>Environmental and Social Impact Assessment (ESIA) for the Gamsberg Mine Zinc Smelter, Black Mountain Mine (Vedanta), South Africa (2019-20)</p>	<p>Project Director for the ESIA for a new zinc smelter and associated infrastructure to beneficiate the 250 000 to 300 000 tpa of zinc concentrate produced at the Gamsberg Zinc Mine Phase-1 concentrator plant. The ESIA included extensive baseline studies including biodiversity, social, air quality, noise, visual, hydrology, geohydrology, and climate change. The process included extensive stakeholder engagement during the scoping and impact assessment phase.</p>
<p>ESIA Scoping Phase for the desalination plant and water carrier system, NamWater, Windhoek Namibia (2019-20)</p>	<p>Team member for the ESIA Scoping Phase for the proposed desalination plant and water carriage system to secure water supply to the central coast, Windhoek and en-route users. The Scoping Process included extensive stakeholder engagement and the Scoping Report was aligned with the KfW Sustainability Guidelines and World Bank Environmental and Social Standards.</p>
<p>Environmental & Social Due Diligence for 5MW solar PV plant, Confidential Client, Namibia (2019)</p>	<p>Project Director for an Environmental and Social (E&S) Due Diligence (Red Flags only) of a 5 MW solar PV facility located near Outapi, Namibia.</p>
<p>Environmental & Social Screening Study for 20MW solar PV plant, CIGenCo, Eswatini (2019)</p>	<p>Project Director for an Environmental and Social (E&S) Screening Study of two potential sites for development of solar PV projects as part of CIGenCo's bid as part of the Eswatini Independent Power Producers Policy (ESIPPP).</p>
<p>Permitting Strategy and Planning for the Rovuma LNG Project in Mozambique, ExxonMobil, Mozambique (2018-2019)</p>	<p>Team member supporting Exxon with the permitting strategy and plans for the Rovuma LNG Project in northern Mozambique.</p>
<p>Environmental and Social Impact Assessment (ESIA) Gap Analysis for a 50MW solar PV Plant, Volt Renewable, Zimbabwe (2018)</p>	<p>Environmental lead for the review of the locally approved EIA against the IFC Performance Standards. Gaps were identified and an Environmental and Social Action Plan (ESAP) developed to close the gaps.</p>
<p>Environmental and Social Impact Assessment (ESIA) Gap Analysis for a 5-star hotel development, Motal-Engil, Zimbabwe (2018)</p>	<p>Environmental lead for the review of the locally approved EIA against the IFC Performance Standards. Gaps were identified and an Environmental and Social Action Plan (ESAP) developed to close the gaps.</p>

<p>Environmental and Social Screening Study for a 100MW hybrid HFO and Solar PV Power Plant for a mine in Mali, Confidential client (2018)</p>	<p>Environmental lead for the screening of environmental and social risks for the development of a solar PV plant on a mine in Mali.</p>
<p>Environmental and Social Screening Study for 3 x 40MW solar PV plants, Confidential Client, GETFIT Zambia (2018)</p>	<p>Project Manager for an environmental and social screening study for 3 x solar PV sites in Zambia. The Screening Study included the review of desk top information and site visits to assess environmental and social risks. A comparative analysis was undertaken to select the site with the least environmental and social risks. This was combined with the technical analysis to select the preferred site to be taken into more detailed studies.</p>
<p>Environmental and Social Impact Assessment for a 40MW solar PV farm, Enel Green Power, South Africa (2017)</p>	<p>Project Director for an Environmental and Social Impact Assessment for a 40MW solar PV plant in South Africa. The study included scoping and stakeholder engagement, various specialist studies and the compilation of an ESIA Report and ESMP.</p>
<p>Environmental and Social Impact Assessment for 2 run-of-river Hydropower Plants and associated transmission lines in Northern Zambia, Globeleq, Zambia (2017)</p>	<p>Project Director for an Environmental and Social Impact Assessment for 2 run-of-river hydropower plants and associated transmission lines on the Kalungwishi River in Northern Zambia. The study included scoping and stakeholder engagement, various specialist studies including environmental flow, heritage, social, biodiversity, visual, noise and other studies. All work was undertaken to IFC Performance Standards. The project was put on hold after the baseline and Scoping Phase.</p>
<p>Environmental and Social Screening Study for an 212MW HFO Power Plant, Confidential Client, Angola (2017)</p>	<p>Project Director for an Environmental and Social Screening Study for a 212MW HFO Power Plant in Angola. The study included noise and air quality baseline sampling, soil and groundwater baseline sampling, community health screening, and the compilation of a detail legal register and compliance road map.</p>
<p>Environmental and Social Screening Study for a Hydropower Plant in Gabon, Confidential Client, Gabon (2017)</p>	<p>Environmental and Social Screening Study for a Hydropower Plant in Gabon, Confidential Client, Gabon, 2017</p>
<p>Environmental and Social Due Diligence (ESDD) for two Solar PV and two Wind Farm Projects South Africa, Confidential Client, South Africa (2017)</p>	<p>Project Director for the ESDD for two Solar PV and two Wind Farm Projects in South Africa.</p>
<p>Environmental, Health and Safety Risk assessment of four Solar PV sites in South Africa, Enel Green Power, South Africa (2017)</p>	<p>Project Director for the EHS Risk Assessments.</p>
<p>Environmental and Social Impact Assessment for a 100MW to 250MW solar PV Plant, Globeleq, Zambia (2016-17)</p>	<p>Project Director for an Environmental and Social Impact Assessment for a 100MW to 250MW solar PV plant in Zambia. The study included the analysis of key environmental and social impacts, compilation of an ESIA and ESMP reports and stakeholder engagement.</p>

Environmental and Social Screening Study for a solar PV Plant, Confidential client, Zambia (2016)	Project Director for an Environmental and Social Screening Study for the establishment of solar PV power plant in Zambia. The study included the analysis of key environmental and social risks including regulatory, biodiversity and social risks.
Environmental and Social Due Diligence, Six Solar PV Farms, Confidential Client, South Africa (2016)	Project Director for an ESDD for six solar pv farms in South Africa. The ESDD was undertaken against SA Legislation and Regulations and IFC Performance Standards.
Environmental and Social Impact Assessment for a CCGT Power Plant, ArcelorMittal, South Africa (2016)	Project Director for an Environmental and Social Impact Assessment study for the establishment of a CCGT power plant for ArcelorMittal in Saldanha Bay, South Africa. The ESIA includes detailed specialist studies including air emissions modelling, noise modelling, biodiversity and heritage assessment. Full stakeholder engagement is also part of the scope of work.
Environmental and Social Management Plans, Wind Farm Development, Confidential Client, Kenya (2016)	Project Director and involved in advising the client on various strategies including vantage point bird monitoring and management plan development.
Environmental and Social Screening Study of potential solar PV sites, Confidential Client, Ivory Coast (2016)	Environmental and Social Screening Study of potential solar PV sites, Confidential Client, Ivory Coast, 2016
Environmental and Social Impact Assessment for the Tete-Macuse Railway Line and Macuse Power Development, Italthai, Mozambique (2015-17)	Project Director for the Environmental and Social Impact Assessment (ESIA) for the proposed Tete-Macuse railway line and Macuse Port development for the export of coal from Tete Province in Mozambique. The project included the development of over 700km of railway line and a new port development.
Strategic Environmental Assessment for the supporting infrastructure for the Baynes Hydropower Project, Baynes PJTC, Namibia/Angola (2014-15)	Project Director for the Strategic Environmental Assessment of the associated infrastructure for the Baynes hydropower project. The SEA covered the assessment of access roads for construction, transmission lines routing in Angola and Namibia and locations of an airfield.
Cumulative Impact Assessment of the development of numerous hydropower plants on the Kwanza River, Odebrecht, Angola (2014-15)	Project Director for the Cumulative Impact Assessment of the development of a number of hydropower plants on the Cuanza River in Angola.
Environmental and Social Impact Assessment for the Batoka Gorge Hydropower Project, ZRA, Zambia/Zimbabwe (2014-15)	Advisor to the ESIA team undertaking the Environmental and Social Impact Assessment (ESIA) for the proposed Batoka Gorge Hydropower Plant on the Zambezi River below the Victoria Falls. The project includes the construction of a dam wall, hydropower plants, transmission lines and associated infrastructure. The ESIA is being conducted in alignment with the IFC Performance Standards and the World Bank Safeguard Policies.
Environmental and Social Impact Assessment for the Rehabilitation of the Kariba Dam Wall, ZRA, Zambia/Zimbabwe (2014-15)	Project Director for the Environmental and Social Impact Assessment (ESIA) for the proposed Kariba Dam Rehabilitation Project. The project includes the rehabilitation of the plunge pool and spillway of the dam wall. The project is being funded by the World Bank, African Development Bank and the EU.

<p>Environmental and Social Due Diligence (ESDD) for a 98 MW wind farm in South Africa, Confidential Client, South Africa (2015)</p>	<p>Project Director for the ESDD.</p>
<p>Environmental and Social Due Diligence (ESDD) for a 2 x 75 MW solar pv farm in South Africa, Confidential Client, South Africa (2015)</p>	<p>Project Director for the ESDD.</p>
<p>Environmental and Social Due Diligence (ESDD) for a 74 MW wind farm in South Africa, Confidential Client (2015)</p>	<p>Project Director for the ESDD.</p>
<p>Environmental and Social Screening Study for a CCGT Power Plant, Confidential Client, South Africa (2015)</p>	<p>Project Director for an Environmental and Social Screening study for the establishment of a gas power plant in Saldanha Bay, South Africa. The screening study outputs included a permitting strategy, environmental opportunities and constraints maps, and input into the site selection process.</p>
<p>Environmental and Social Impact Assessment for Floating Power Plants in the Port of Richards Bay, Department of Energy IPP Office, South Africa (2015-16)</p>	<p>Project Director for the ESIA for the establishment of Floating Power Plants in the Ports of Richards Bay in South Africa. The ESIA includes detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.</p>
<p>Environmental and Social Impact Assessment for Floating Power Plants in the Port of Richards Bay, Department of Energy IPP Office, South Africa, (2015-16)</p>	<p>Project Director for the ESIA for the establishment of Floating Power Plants in the Ports of Saldanha in South Africa. The ESIA includes detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.</p>
<p>Environmental and Social Impact Assessment for LNG Import Terminal in the Port Richards Bay for the Gas to Power Programme, Department of Energy IPP Office, South Africa (2015-16)</p>	<p>Project Director for the ESIA for the establishment of LNG Import Terminals as part of the DoE’s Gas to Power Programme in South Africa. The ESIA includes detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.</p>
<p>Environmental and Social Impact Assessment for LNG Import Terminal in the Port Saldanha for the Gas to Power Programme, Department of Energy IPP Office, South Africa, (2015-16)</p>	<p>Project Director for the ESIA for the establishment of LNG Import Terminals as part of the DoE’s Gas to Power Programme in South Africa. The ESIA includes detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.</p>
<p>Environmental and Social Screening study for the establishment of an CCGT power plant in the Ports of Richards Bay, Confidential client, South Africa (2015)</p>	<p>Project Director for an Environmental and Social Screening Study for the establishment of a CCGT power plant in Richards Bay, South Africa. The study included the analysis of key environmental and social risks including air emissions, effluent emissions, biodiversity (terrestrial and marine) and social issues. The assessment applies to the power plant site, transmission line routing and pipeline routing and compares the opportunities and constraints associated with the two locations.</p>

<p>Environmental and Social Screening study for the establishment of an CCGT power plant in the Port of Saldanha, Confidential client, South Africa (2015)</p>	<p>Project Director for an Environmental and Social Screening Study for the establishment of a CCGT power plant in Saldanha Bay, South Africa. The study included the analysis of key environmental and social risks including air emissions, effluent emissions, biodiversity (terrestrial and marine) and social issues. The assessment applies to the power plant site, transmission line routing and pipeline routing and compares the opportunities and constraints associated with the two locations.</p>
<p>Environmental and Social Screening study for the establishment of an SCGT power plant in the Ports of Saldanha, Confidential client, South Africa (2015)</p>	<p>Project Director for an Environmental and Social Screening Study for the establishment of an SCGT power plant in the Port of Saldanha. The study included the analysis of key environmental and social risks including air emissions, effluent emissions, biodiversity (terrestrial and marine) and social issues. The assessment applies to the power plant site, transmission line routing and pipeline routing.</p>
<p>Environmental and Social Impact Assessment for the Burgan Oil Fuel Storage Depot in the Port of Cape Town, Burgan Oil, South Africa (2014-15)</p>	<p>Project Director for the ESIA for the Burgan Oil Fuel Storage Depot in the Port of Cape Town.</p>
<p>Millennium Challenge Account – Malawi: Infrastructure Development Project – Energy Sector (hydropower plants, transmission and distribution lines and substations), MCC, Malawi (2014-15)</p>	<p>Environmental Lead for the Independent Engineer to review all the Contracting Engineers environmental and social studies associated with the Infrastructure Development Project. The project includes the upgrade and development of new power infrastructure including hydropower plants, transmission lines, distribution lines and substations.</p>
<p>Strategic Environmental Assessment of the New Town Integrated Development Zone, TFM Mining, Katanga Province, DRC (2014)</p>	<p>Project Director for the Strategic Environmental Assessment of the New Town Integrated Development Zone undertaken for Tenke Fungurume Mining (TFM) in Katanga Province, DRC.</p>
<p>Environmental and Social Impact Assessment (ESIA) for the Gamsberg Zinc Mine, South Africa, Black Mountain Mine (Vedanta) (2012-13)</p>	<p>Project Director for the Environmental and Social Impact Assessment for a new Zinc Mine in the Northern Cape Province in South Africa. The ESIA includes the assessment of the mine and all associated infrastructure including waste rock dumps, tailing dams, processing plant, transmission lines, a new township development, upgrade of a water pipeline and associated water treatment facilities, and transport options to the Port of Saldanha via both road and rail. The ESIA is being undertaken as an integrative process to meet various environmental legal requirements including National Environmental Management Act (NEMA): EIA Regulations, NEM: Waste Act, NEM: Air Quality Act, NEM: Biodiversity Act, National Heritage Resource Act, National Water Act and the Minerals Petroleum Resources Development Act. The process includes various specialist studies, full stakeholder engagement as well as integration with a Biodiversity Off-sets process.</p>
<p>Environmental and Social Impact Assessment for the Expansion of Transnet's existing Manganese Ore Export Railway Line and Associated Infrastructure, South Africa (2012)</p>	<p>Project Director for the ESIA for the Expansion of Transnet's existing Manganese Ore Export Railway Line and Associated Infrastructure in the Northern and Eastern Cape, South Africa.</p>

<p>Ore Line Expansion Project for the Sishen-Saldanha Ore Line and Port of Saldanha, various Mining Companies and Transnet, South Africa (2011-2012)</p>	<p>Project Director for the Environmental and Social Screening Study for the Pre-feasibility Phase of the Ore Line Expansion Project. This included compiling a detail Environmental and Social Design Criteria Report together with initial Stakeholder Engagement. A detailed multi-criteria assessment for various port and stockpile options was undertaken. The project included upgrading over a 1000 km of railway line and upgrading the port facilities including stockpiles, stacker-reclaimers, conveyors and ship loading facilities. The stakeholder engagement process was specifically designed to obtain buy-in from stakeholder who were strongly opposed some components of the port and rail expansion.</p>
<p>Strategic Environmental Assessment for the Mozambican Regional Gateway Programme, MRGP, Mozambique, Malawi, Zambia, Zimbabwe (2012)</p>	<p>Project Director for the SEA of the MRGP. The MRGP aims to support the improvement of the Southern African transport (roads, rail and ports), regional infrastructure network, which uses Mozambique as a gateway for international trade. The MRGP geographic scope encompasses the Beira and Nacala Transport Corridors and the respective links to the Maputo and Limpopo Corridors. The SEA identified environmental and social issues that need to be considered in the long terms planning an implementation of the rail and port infrastructure that makes up the Beira and Nacala Transport Corridors.</p>
<p>Strategic Environmental Assessment (SEA) for the coastline of Mozambique, MICOA, Mozambique (2012)</p>	<p>Adviser on the SEA for the coast of Mozambique. The SEA aims to identify potential conflicts between various uses of the coastal zone and to recommend strategic interventions to facilitate sustainable development within the coastal zone. Various users of the coastal zone that are being considered include off-shore oil and gas operations, coastal mining, tourism, conservation and artisanal and industrial fishing.</p>
<p>Environmental and Social Screening Study for port options in Pemba Bay, Anadarko, Mozambique (2012)</p>	<p>Project Lead for an Environmental and Social Screening Study for various port options in Pemba Bay. The screening study includes a multi-criteria assessment of various port locations taking into account marine and terrestrial ecology, social issues, land ownership, legal aspects and physical marine conditions.</p>
<p>Environmental and Social Impact Assessment for a LPG import and distribution facility, Sunrise Energy, South Africa (2011-2012)</p>	<p>Project Director for the Scoping/EIA for a LPG importation, storage and distribution facility which includes a marine offloading facility in Saldanha Bay, a pipeline and a storage facility. The environmental permitting process required the liaison with local and provincial environmental authorities, co-ordination of specialist studies, public participation and impact assessment.</p>
<p>Environmental and Social Screening Study for a Mine development in Angola, Confidential Client, Angola (2011-2012)</p>	<p>Project Director for the Environmental and Social Screening Study for the Concept Phase for a new mine development in Angola. The study included identifying environmental and social risks to the project and costing a full ESIA according to IFC Performance Standards and Equator Principles.</p>
<p>Equator Principles and IFC Performance Standards Training, Vedanta Resources Plc, Zambia (2012)</p>	<p>Lead facilitator of a 5-day training course on the implementation of the Equator Principles and IFC Performance Standards for a number of Vedanta's mining operations across Southern Africa, Europe and Australia.</p>
<p>Environmental and Social Impact Assessment for the upgrade of the Principe Airport, HBD, Principe (2011-2012)</p>	<p>Project Director for the Environmental and Social Impact Assessment for the upgrade of the airport in Principe.</p>
<p>EIA for a 380MW renewable energy facility north of Touwsrivier in the Western Cape (2010-2011)</p>	<p>Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.</p>

EIA for a 170MW renewable energy facility east of Touwsrivier in the Western Cape (2010-2011)	Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.
EIA for a 670MW renewable energy facility south of Sutherland in the Western and Northern Cape (2010-2011)	Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process requires the liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.
EIA for a 500MW renewable energy facility south of Beaufort West in the Western Cape (2010-2011)	Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.
EIA for a 120MW renewable energy facility south east of Victoria West in the Northern Cape (2010-2011)	Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.
EIA for a 225MW wind farm in the Richtersveld, Western Cape (2011)	Project Director for the Scoping/EIA for a proposed wind farm. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.
EIA for a 750MW wind farm in the Roggeveld, Western Cape and Northern Cape (2011) Director	Project Director for the Scoping/EIA for a proposed wind farm. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.
EIA for a 225MW renewable energy facility between Vredenburg and Velddrif in the Western Cape (2010-2011)	Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.
Environmental and Social Impact Assessment for the Lesotho Highland 150 MW Wind Power Project, Breeze Power, Lesotho (2011)	Project Director for the Scoping Phase of the Environmental and Social Impact Assessment for a 150MW wind farm development in Lesotho. The Scoping Phase included the analysis of available information to identify key environmental and social risks associated with the siting of the wind farm.
Environmental Screening Study for a Wind Farm Development in the Southern Cape, South Africa (2011)	Project Director for the Environmental Screening Study for a wind farm development in the Southern Cape.
Environmental and Social Due Diligence for a Wind Farm Development in Coega, Electrawinds, South Africa (2011)	Project Director for the Environmental and Social Due Diligence for a wind farm development in the Coega.

<p>Environmental and Social Impact Assessment for Venetia Diamond Mine, De Beers, South Africa (2011)</p>	<p>Project Director for the Scoping and ESIA for the proposed new underground mine and EMP consolidation for existing mining activities. The ESIA was undertaken as an integrative process to meet various environmental legal requirements including National Environmental Management Act (NEMA): EIA Regulations, NEM: Waste Act, NEM: Air Quality Act, NEM: Biodiversity Act, National Heritage Resource Act, National Water Act and the Minerals Petroleum Resources Development Act.</p>
<p>Environmental and Social Impact Assessment for a river barging project on the Zambezi River, Riversdale Mining, Mozambique (2010-2011)</p>	<p>Project Director for the project which includes the assessment of environmental and social impacts associated with dredging over 500km of the Zambezi River. The project includes full stakeholder engagement, coordination of various specialist studies with extensive field work and the integration of all information into an ESIA report and ESMP.</p>
<p>EIA for two solar PV plant development, South Africa (2010)</p>	<p>Project Director of the EIA for the development of two solar PV plants in the Northern Cape and Free State Provinces of South Africa. ERM undertook the required studies to obtain environmental approval for these developments, including specialist studies such as landscape and visual and cultural heritage assessments, and stakeholder engagement.</p>
<p>Basic Assessment for the installation of wind measuring masts on six sites in the Western Cape and two sites in the Northern Cape (2010)</p>	<p>Project Director for the Basic Assessments to install wind measuring masts at eight sites in South Africa. The scope of work included the submission of the application, public participation, preparation of an EMP and submission of the Basic Assessment report.</p>
<p>EIA for a 100MW renewable energy facility north of Velddrif in the in the Western Cape (2010)</p>	<p>Project Director for the Scoping process for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required the liaison with local, provincial and national environmental authorities, co-ordination of specialist studies and public participation.</p>
<p>EIA for a 300MW renewable energy facility east of Lambert’s Bay in the Western Cape (2010)</p>	<p>Project Director for the Scoping process for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies and public participation.</p>
<p>External adviser and reviewer for an ESIA for a wind farm development in the Eastern Cape, Confidential Client, South Africa (2010)</p>	<p>Adviser and reviewer for an EIA for the development of a wind farm in the Eastern Cape.</p>
<p>Environmental Advisor Environmental and Social Impact Assessment for the Mphanda Nkuwa Hydropower Project in Mozambique (2010)</p>	<p>Advisor for the ESIA for the Mphanda Nkuwa Hydropower Project in Mozambique. The core service was to advise the project team on international standards such as the IFC Performance Standards and World Commission on Dams.</p>
<p>Environmental Sensitivity Study of the Durban Airport Site Expansion Project , South Africa, Transnet (2010)</p>	<p>Project Director for the Environmental Sensitivity Study for the proposed dig-out port currently being considered by Transnet at the Durban International Airport Site. The aim of this assessment was to determine the biophysical, natural and social opportunities and constraints to the development of the dig-out port, as well as provide a strategic overview of the environmental context of the site. In addition, the sensitivity study provided strategic guidance in terms of the environmental due process and licensing requirements with respect to the National Environmental Management Act, and associated legislation.</p>

<p>ESIA for a new high voltage overhead transmission power line in Cameroon, AES Sonel, Cameroon (2007- 2009)</p>	<p>Project Director for the Environmental and Social Impact Assessment and a full Resettlement Action Plan for a new electricity distribution project, comprising a 113km overhead power line, for AES Sonel. As Project Director, Mr Heather-Clark was responsible for client liaison, quality control and final review of all reports.</p>
<p>Advisor to the Environmental and Social Impact Assessment for the Baynes Hydropower Project in Namibia and Angola (2009)</p>	<p>Project Advisor for the Environmental and Social Impact Assessment for the proposed Baynes Hydropower Project on the Kunene River. The ESHIA process is being conducted in accordance to the Angolan EIA Regulations, the Namibian EIA Regulations, the World Bank Safeguard Policies and the IFC performance standards.</p>
<p>Environmental and Social Impact Assessment for the upgrade of a 1100 km railway line in South Africa, Transnet (2008- 2009)</p>	<p>Project Director for the Environmental and Social Impact Assessment for the upgrade of a commodities railway line across South Africa. The project included a number of specialist studies, managing subcontractors, interfacing with the railway engineering team, report writing, managing an extensive stakeholder consultation process, client liaison and management of project finances.</p>
<p>Environmental and Social Impact Assessment for the services corridor associated with the development of a greenfield CTL Plant, Sasol, South Africa (2009)</p>	<p>Project Director for an ESIA of a services corridor to support the development of a greenfield CTL plant development in South Africa. The ESHIA process was conducted in accordance to the South African EIA Regulations and the IFC performance standards.</p>
<p>Environmental and Social Impact Assessment for 2D seismic exploration project in the Rovuma Basin, Petronas, Mozambique (2009)</p>	<p>Project Director for the ESIA for the offshore seismic exploration activities in Blocks 3 & 6, situated in the Rovuma Basin off the coast of Mozambique. The exploration activities comprise 2D seismic surveys in deepwater.</p>
<p>Environmental and Social Screening Study for a river barging project on the Zambezi River, Riversdale Mining, Mozambique (2009)</p>	<p>Project Director for the project which included the assessment of environmental and social risks associated with dredging over 500km of the Zambezi River. The project included reviewing existing information, mapping key sensitivities and facilitating a specialist workshop in order to develop Terms of Reference for detailed baseline studies that will be required should the project proceed to a full ESIA.</p>
<p>Equator Principled and IFC Performance Standards Review and Training, African Housing Solutions, South Africa (2009)</p>	<p>Lead reviewer for the ESIA and Resettlement Policy Framework, for a housing development in Nigeria, against the Equator Principles and IFC Performance Standards. Mr Heather-Clark was responsible for reviewing the ESIA Report and for presenting a 2 ½ day training course on the Equator Principles and IFC Performance Standards.</p>
<p>Environmental Assessment for the dredging and disposal of dredge spoil at the Port of Saldanha, Transnet, South Africa (2008)</p>	<p>Project Director for this project and was responsible for guidance of technical studies which included dredging studies and marine sediment contamination characterization. The study included the assessment of dredge spoil dumping alternatives. Stakeholder engagement included an important component of the project.</p>
<p>Environmental and Social Screening Study, Port of Saldanha, Transnet, South Africa (2008)</p>	<p>Project Director for the screening study which included an assessment of alternative berth options for the export of iron ore at the iron ore terminal at the Port of Saldanha, South Africa. The work included ongoing interaction with the port engineering and design teams, together with stakeholder engagement.</p>

<p>ESIA for an Early Production System (EPS) and Power Plant for Kaiso-Tonya Area, Exploration Area 2, Tullow Uganda Operations Pty Ltd, Uganda (2007-08)</p>	<p>Project Director for the project which included a full ESIA for an Early Production System and associated Power Plant in the Kaiso-Tonya area on the banks of Lake Albert, Uganda. The intent of the project is to produce oil (and small amounts of gas) which will be converted into electrical power and distillate products (kerosene and diesel) for consumption within Uganda. The electrical power will be fed into the main grid supplementing the Ugandan electrical power grid while the distilled products (diesel and kerosene) will be used to displace the currently imported fuels. The ESIA included a detailed assessment of alternative sites for the proposed EPS and power plant, together with various environmental and social baseline studies and stakeholder engagement.</p>
<p>ESIA monitoring studies for Sasol’s Off-shore gas exploration activities in Inhambane and Sofala Provinces, Mozambique, Sasol Petroleum Sofala & Empresa Nacional de Hidrocarbonetos (2007-08)</p>	<p>Project Director for an environmental monitoring survey programme for Sasol’s offshore hydrocarbon exploration activities. Monitoring studies included seismic noise modelling and monitoring, dugong surveys, artisanal fish catch monitoring, coral reef surveys and monitoring, sea turtle monitoring and tourism monitoring.</p>
<p>Strategic Environmental and Social Overview and ESIA’s for offshore exploration well drilling activities in Blocks 2 and 3A, Lake Albert, Uganda. Tullow Oil Plc and Heritage Oil and Gas Limited (2006- 2008)</p>	<p>Project Director for this project. The project involved undertaking a strategic overview study of Lake Albert that provided background information on the limnological (physical, chemical and biological) features of the lake as well as environmental and socio-economic resources (such as nature reserves, tourism nodes, prime fishing areas etc). It also presented areas of environmental risk and opportunity associated with oil explorations on, and immediately adjacent to, the lake. The strategic overview provided a framework within which ESIA’s were undertaken for the offshore drilling project. A site selection study was undertaken for onshore support infrastructure. Baseline studies included shoreline sensitivity mapping, oil spill modelling, water and sediment quality surveys, fish and fisheries surveys, socio-economic surveys and terrestrial ecology surveys. An extensive public participation process was undertaken as part of the ESIA’s.</p>
<p>Environmental and Social Baseline Assessment for a green fields coal mine and CTL plant development, Sasol, South Africa (2008)</p>	<p>Project Director the environmental and social baseline studies to support the evaluation of sites for potential development of a green field’s coal mine and associated CTL Plant in South Africa. Mr. Heather-Clark has assisted with review and quality control of the various baseline studies.</p>
<p>Development of guideline document for the integration of environmental and social issues into the project lifecycle for mine development, De Beers, South Africa (2008)</p>	<p>Team member of the project team that assisted the client in developing a detailed guideline document for the integration of social and environmental issues into mine planning. This included all phases of the planning process from Concept through to Pre-feasibility, Feasibility and Implementation. Mr Heather-Clark, as lead facilitator, presented a 2 day training course on these guidelines, to mine planners and engineers.</p>
<p>EIA for a Metal Recovery Plant and Slag Crushing, Screening and Weathering facility at Arcelor Mittal Saldanha Works, MultiServ, South Africa (2007 – 2008)</p>	<p>Project Director for the EIA, including a public consultation process and the following specialist studies: air quality, groundwater, noise impact assessment, botanical and archaeology studies and a traffic impact assessment. Mr Heather-Clark was responsible for client liaison, quality control and final review of all reports.</p>

<p>Implementation of the Equator Principles for Standard Bank's Project Financing Processes, Standard Bank, South Africa (2008)</p>	<p>Lead facilitators for Equator Principles and IFC Performance Standards training to assist Standard Bank in adopting the Equator Principles. An assessment system (based on the IFC Performance Standards) to link with Standard Bank's project finance transaction life-cycle was developed. This involved the development of "tools" and guidance documents to form a system, together with training on the use of the system for all project finance staff.</p>
<p>Comparative review of EIAs undertaken by ERM globally for electricity utilities, Eskom, South Africa (2007)</p>	<p>Project Director for this project. The project included research to provide Eskom with an overview of different EIA governance systems and approaches to managing EIAs in other countries, as well as identifying trends in EIA practice.</p>
<p>Environmental and Social Screening and Qualitative Risk Assessment Western Ports and Rail Corridor, Transnet, South Africa (2007)</p>	<p>Project Director involved in identifying environmental and social risks associated with future port development in the Port of Saldanha, Port of Cape Town and Port of Mossel Bay. The scope of the study included the review of previous EIAs, SEAs and other planning documents to identify environmental and social drivers and assess their risk to future port planning, development and operations. As the environmental team, ERM interacted on a regular basis with the port engineering and design teams to develop a port development framework for a 30 year planning period.</p>
<p>Environmental and Social Screening and Qualitative Risk Assessment Central Ports and Rail Corridor, Transnet, South Africa (2007)</p>	<p>Project Director involved in identifying environmental and social risks associated with future port development in the Port of East London, Port of Port Elizabeth and Port of Ngqura. The scope of the study included the review of previous EIAs, SEAs and other planning documents to identify environmental and social drivers and assess their risk to future port planning, development and operations. As the environmental team, ERM interacted on a regular basis with the port engineering and design teams to develop a port development framework for a 30 year planning period.</p>
<p>Environmental and Social Screening and Qualitative Risk Assessment Eastern Ports and Rail Corridor, Transnet, South Africa (2007)</p>	<p>Project Director involved in identifying environmental and social risks associated with future port development in the Port of Durban and Port of Richards Bay. The scope of the study included the review of previous EIAs, SEAs and other planning documents to identify environmental and social drivers and assess their risk to future port planning, development and operations. As the environmental team, ERM interacted on a regular basis with the port engineering and design teams to develop a port development framework for a 30 year planning period.</p>
<p>EIA of the Moatize Coal Mine and associated railway line and deep water port infrastructure, CVRD, Tete Province, Mozambique (2006-2007)</p>	<p>Project Coordinator and Cost Controller on this project. ERM was commissioned by CVRD, a Brazilian Mining Company, to undertake environmental studies related to the green fields development of a coal mine in Tete Province, Mozambique. The project included the development of a power plant, railway line and port for the export of coal.</p>
<p>Corporate Social Responsibility Strategy development for a leading South African retailer, South Africa (2006)</p>	<p>Lead facilitator for this project. The project involved identifying and prioritising the company's sustainability issues and defining a strategy to address these issues. The process was driven by the need for the company to be listed on the Johannesburg Stock Exchanges SRI Index.</p>
<p>Research project on the effects of water scarcity on the fresh produce supply to a major South Africa retailer, South Africa (2006)</p>	<p>Project Leader coordinated a group of researchers to identify water scarce areas and to plot these against the location of fresh produce suppliers for a major retailer in South Africa. This researched form a core component of the companies Sustainability Strategy.</p>
<p>Independent Environmental Advisers to the Financing Parties of the Gautrain Rapid Rail Link project, Bowman Gilfillan (2006)</p>	<p>Independent Environmental Advisers to the Financing Parties, provided review and advisory services through Bowman Gilfillan on Environmental Management Plans for the Gautrain Rapid Link project.</p>

<p>ESIA for seismic surveys and exploration well drilling and testing in Blocks 16 and 19 off the coast of Mozambique, Sasol Petroleum Sofala & Empresa Nacional de Hidrocarbonetos (2005 – 2006)</p>	<p>Project Manager for the ESIA which involved undertaking an ESIA and compiling EMPs for offshore exploration activities in Blocks 16 & 19, situated to the east of the Bazaruto Archipelago National Park, off the coast of Mozambique. The exploration activities comprised 2D and 3D seismic surveys in deepwater and shallow water as well as exploration well drilling and testing activities.</p>
<p>EIA for the upgrade and expansion of the existing sinter plant at Vanderbijlpark, ArcelorMittal, South Africa (2006)</p>	<p>Project Director for the EIA and stakeholder engagement process to meet South African requirements. This included coordination of the technology review, air quality, health and waste management specialist studies and compilation of the integrated Scoping and EIA Report.</p>
<p>Review of Sustainability Report and Sustainability Management System, Confidential, South Africa (2004)</p>	<p>Lead reviewer of the Sustainability Report of a leading retailer in South Africa and providing adhoc advice on sustainability issues. This included compiling a monthly news letter to staff on relevant sustainability issues facing the retail industry in South Africa.</p>
<p>EIA of a proposed expansion of the Container Terminal Stacking area at the Port of Cape Town, National Ports Authority, South Africa (2003-2004)</p>	<p>Project Manager for this EIA. The project included the expansion of the Cape Town container terminal into the sea through dredging 1 million m3 of material for reclamation. The project included a detailed study on alternative sources for fill material and other studies which focused on marine archaeology, coastal erosion, marine hydrodynamics and water quality, visual, noise and traffic. The EIA included full stakeholder engagement throughout the EIA process.</p>
<p>Environmental Site Suitability Study for a manganese smelter, Asia Minerals Limited (2004)</p>	<p>Part of the project team that undertook a preliminary site selection process for a manganese smelter by identifying key environmental and social issues for potential sites within Southern Africa. Sites included the Belualane Industrial Park (Mozambique) and Richards Bay, the Coega Industrial Development Zone (IDZ) and Saldanha (South Africa).</p>
<p>DFID funded project to assess progress towards meeting the water related targets of the Millennium Development Goals, DIFD, Zambia (2004)</p>	<p>Country Coordinator for Zambia on this project. The project included detailed stakeholder surveys secondary data analysis to establish the countries progress towards meeting the Millennium Development Goals, specifically related to water supply and sanitation.</p>
<p>Roll-out of ISO14001 and OHSAS18001 management systems to 2 industrial sites in South Africa, Confidential, South Africa (2004)</p>	<p>Project Manager responsible for undertaking ISO14001 training at two industrial sites. The project formed part of a global initiative to have several industrial sites throughout Africa and Europe ISO14001 certified.</p>
<p>Strategic Environmental Assessment (SEA) for the Port of Cape Town, National Ports Authority of South Africa, South Africa (2003)</p>	<p>Project Manager for this project and played a lead role in directing the course and outcome of the SEA. The SEA focussed on key environmental and social opportunities and constraint to the future long term development of the Port of Cape Town. A Sustainability Framework was developed to address key opportunities and constraints and to set up long terms monitoring programs. A key component of this study was to understand the Port-City linkages and developing mechanisms to ensure that port planning was supported by city planning and visa-versa.</p>
<p>Strategic Environmental Assessment (SEA) for the Port of Richards Bay, National Ports Authority of South Africa, South Africa (2003)</p>	<p>Project Adviser for this project and played a lead role in directing the course and outcome of the SEA. The SEA focussed on key environmental and social opportunities and constraint to the future long term development of the Port of Cape Town. A Sustainability Framework was developed to address key opportunities and constraints and to set up long terms monitoring programs. A key component of this study was to understand the Port-City linkages and developing mechanisms to ensure that port</p>

	planning was supported by city planning and visa-versa.
E&S Due Diligence of the Phase 2 Maputo Port Revitalisation and Rehabilitation Project, Standard Corporate Merchant Bank, Mozambique (2003)	Environmental Adviser to the Standard Corporate Merchant Bank for the review of the EIA and Risk Assessment studies undertaken for the Phase 2 Maputo Port Revitalisation and Rehabilitation Project. The EIA was reviewed against the Mozambican and International Best Practice guidelines and detailed recommendation made on how to manage the environmental risks associated with the revitalisation project.
National Oil Spill Contingency Plan for Cameroon, funded by the World Bank, Cameroon Government, Cameroon (2003)	Part of the team that compiled a comprehensive Oil Spill Contingency Plan for Cameroon (OSCP). The OSCP form a core component of the Chad Cameroon Pipeline and included contingency plans for both on land and marine based spills. The OSCP was compiled according to the IPEACA guidelines and was reviewed by the World Bank.
EIA/SEA Capacity Building, Environmental Public Authority (EPA), State of Kuwait (2003)	Lead facilitator for a 2 day training course on SEA and EIA for the Environmental Public Authority (EPA) of the State of Kuwait.
Training Workshop on Strategic Environmental Assessment for South Eastern Africa and the Western Indian Ocean Island States, SEACAM, Mozambique (2003)	Lead course facilitator for the SEA training course funded by SEACAM. The training course included the principles of SEA, SEA process and case studies of SEA's in Southern Africa.
Improving the Effectiveness of EIA and the Potential of SEA in Southern Africa: Case Study on SEA of the National Commercial Ports Policy and SEA for the Port of Cape Town, World Bank/SAIEA, Namibia (2003)	Presenter of two case studies on SEA at a regional workshop funded by the World Bank and SAIEA.
Environmental Impact Assessment for the Eskom SABRE-GEN wind turbine test facility, Eskom, South Africa (2002)	Project Manager for the EIA. The EIA included stakeholder engagement throughout the process and included the following specialist studies: visual assessment, bird strike modelling and noise assessment.
Strategic Environmental Assessment: Scoping Phase Port of Richards Bay, National Ports Authority of South Africa, South Africa (2002)	Project Leader and integrative writer for the Scoping Phase of the SEA for the Port of Richards Bay. This phase included detailed stakeholder consultation to identify opportunities and constraints to long term port development at the Port of Richards Bay.
White Paper on National Commercial Ports Policy, National Ports Authority, South Africa 2002	Lead reviewer of the White Paper on National Commercial Ports Policy for South Africa. The review focussed on the integration of environmental and social issues into the port planning process. Mr Heather-Clark made a formal submission and presentation to the Portfolio Committee on Transport in the South African Parliament.

Environmental Liability and Risk Assessment for the Multi-Purpose Terminal at the Port of Saldanha, National Ports Operations, South Africa (2002)	Project Manager for the project. The purpose of the project was to identify key environmental risks associate with the material handling at the Multi-Purpose Terminal at the Port of Saldanha.
Environmental Overview of South Africa's major ports with special reference to future container terminal development, National Ports Authority Container Terminal Strategy, National Ports Authority, South Africa (2002)	Project Manager for the comparative assessment of the relative environmental sensitivity of the seven commercial ports in South Africa with reference to future container terminal development. The study included a detail review of secondary environmental information of all the ports, the identification of specific environmental criteria and the use of these criteria to rank each port in terms of its sensitivity to future container terminal development.
Review of the EIA undertaken for the Maputo Port Privatisation and Rehabilitation Project, Development Bank of Southern Africa (DBSA), South Africa (2002)	Environmental Adviser to the Development Bank of Southern Africa to review the Phase 1 EIA for the Maputo Port Privatisation and Rehabilitation Project. The review was undertaken against the Mozambican EIA Regulations and International Best Practice.
Oil Spill Contingency Plan, Agip Angola oil operations, Angola, (2002)	Team member of the team to develop an oil spill contingency plan according to the IPEICA International Guidelines.
Ecologically Sustainable Industrial Development Programme, United Nations Industrial Development Organisation (UNIDO), Tanzania (2002)	Team member of the project team appointed to review the Industrial Development Strategy for Industrial Development in Tanzania. The focus of the project was to integrate environmental and social issues into the programme.
Environmental Audit and Assessment of the Socio-economic Impacts of the Trans-Kgalagadi Highway, Botswana, Development Bank of Southern Africa, Botswana (2002)	Lead reviewer of the EIA and EMP implementation for the Trans-Kalagadi corridor in Botswana. The review included site visits, detailed interviews and review of secondary data and records.
World Bank EIA Project Management Training Course, World Bank/SAIEA, Zambia (2002)	Lead facilitator for the 5 day EIA Project Management Training Course. The course was presented to 20 African delegates from southern Africa. The course focused on the practical aspects of EIA project management including budgeting and scheduling an EIA, contract negotiations with clients, managing specialist studies, managing the public participation phase and compiling an integrated EIA report. The course formed part of a Southern Africa capacity building initiative lead by the SAIEA.
Environmental screening study for the establishment of a deep-water port at Ponta Dobela, Confidential Client, Mozambique (2001)	Team member of the project team who undertook a screening study to identify environmental, social and economic issues and show stoppers associated with the development of a deep-water port on the coast on Mozambique.
ESIA of the proposed seismic survey in licence area 2814a on the continental shelf of Namibia, Shell Exploration and Production Namibia B.V., Namibia (2001)	Team member of the ESIA for the offshore seismic exploration project. The ESIA included all issues associated with seismic surveys including seismic noise impacts on marine mammals, oil spill modelling and general environmental management issues.

<p>Environmental Impact Review for the abandonment of the Cuntala Well Protector Platform off the coast of Angola (Block 2), Texaco Panama Inc., Angola (2001)</p>	<p>Team member of the project team who developed a decommissioning plan for a well protector platform off the coast of Angola.</p>
<p>Legal, Technical and Economic Feasibility Study for the Commercialisation of the SSF Association Milnerton Tank Farm and its links to the Port of Cape Town, SFF, Cape Town (2001)</p>	<p>Project Manager for this project.</p>
<p>ESIA of the Phase 2 expansion of the Mozal Aluminium Smelter and Matola Port Terminal in Maputo, BHP Billiton, Mozambique (2000-2001)</p>	<p>Project Manager and integrative writer for this ESIA. The EIA included an assessment of the expansion of the port terminal at the Port of Matola and a review of the Phase 2 expansion of the aluminium smelter. All reports together with the EIA process were reviewed and approved by the International Finance Corporation (IFC).</p>
<p>Scoping Phase of the Environmental Impact Assessment for the expansion of the Container Terminal at the Port of Cape Town, Portnet, South Africa (2000)</p>	<p>Project Manager for the EIA for the expansion of the container terminal at the Port of Cape Town. The project included the dredging of 1 million m3 dredge material to provide fill for the expansion of the port. Specialist studies that were required included coastal dynamic modelling, hydrodynamic modelling to assess water quality issues associated with dredging, marine archaeological issues, marine ecology issues, traffic, visual and noise.</p>
<p>Strategic Integrated Port Planning, Port of Saldanha, Transnet (1998)</p>	<p>Project Manager for the Strategic Integrated Port Planning process for the Port of Saldanha. The process culminated in the first Port Development Framework for the Port of Saldanha which integrated environmental and social issues into the port planning process. It included the identification and inclusion of environmental and social opportunities and constraints into the future port planning and development.</p>
<p>Environmental Impact Assessment for the PPC Slag Grinding Mill within the Saldanha Steel Complex, PPC (1998)</p>	<p>Project Manager for the EIA for PPC slag grinding mill. The EIA included a number of specialist studies and comprehensive stakeholder engagement.</p>

MEMBERSHIPS	
CEAPSA	Certified as an Environmental Practitioner with the Interim Certification Board for Environmental Assessment Practitioners of South Africa (2006)
IAIAsa	Member of the International Association for Impact Assessment South Africa
IAIA International	Member of the International Association for Impact Assessment
PUBLICATIONS	
	Sep 2007: Co-author of case study for IIEDs 'User Guide' to effective tools and methods for integrating environment and development. South African case study: Role of environmental and social screening in informing the conceptual design and planning of large-scale projects in the pre-feasibility stage.
	Aug 2003: Author of a case study on the SEA for the Port of Cape Town, contained in "The Status and Potential of Strategic Environmental Assessment" by Barry Dalal-Clayton and Barry Saddler, DRAFT 17 September 2003.
	March 2002: Strategic Integrated Port Planning: Moving from EIA to SEA. International Conference on Coastal Zone Management and Development, Kuwait 18 to 20 March 2002.
	Nov 2000: Sustainable Port Development: Report on the preparatory seminar for Africa. 7th International Conference of the International Association for Cities and Ports, Marseilles – France.
	Mar 2000: The development of Strategic Environmental Assessment in South Africa: Journal of Impact Assessment and Project Appraisal, Vol 18, Number 3, pg 217-223. September 2000.
	April 1999: Integrating environmental opportunities and constraints into Port Planning, Development and Operation. 5th International Conference on Coastal and Port Engineering in Developing Countries, Cape Town, 19 to 23 April 1999.

CURRICULUM VITAE



LIANDRA SCOTT-SHAW

SENIOR ENVIRONMENTAL CONSULTANT

Environmental Management, Planning and Approvals, South Africa

QUALIFICATIONS

Pr.Sci.Nat	2017	Professional Natural Scientist (Ecological Science), South African Council for Natural Scientific Professions
BSc Hons.	2009	BSc Honours (Ecological Science), University of KwaZulu Natal
BSc	2008	BSc (Biological Science), University of KwaZulu Natal

EXPERTISE

- Environmental Impact Assessment
- Environmental licensing
- Environmental Compliance monitoring and auditing
- Vegetation Impacts Assessment and permitting
- Diatom Biomonitoring

Liandra joined SLR in March 2021 in her capacity as Senior Environmental Consultant and has over 8 years' experience as an Environmental Assessment Practitioner within the environmental consulting field. She has degrees in Biological and Ecological Science and has expertise in a wide range of environmental disciplines, including Environmental Impact Assessments, Environmental Management Programmes, Environmental Compliance Monitoring & Auditing and Vegetation Assessments and Diatom Biomonitoring.

She has been responsible for the management of a wide range of projects, including environmental authorisations, compliance monitoring and auditing, vegetation assessments and permitting and diatom biomonitoring.

Over the last few years Liandra's focus has been in the renewable energy sector. Specifically involved with Environmental Impact Assessments and specialist management for the Risk Mitigation Independent Power Producer Procurement and Renewable Energy Independent Power Producer Procurement Programmes (RMIPPPP and REIPPPP).

A sample of Liandra's recent project experience, is provided below.

PROJECTS

RENEWABLE ENERGY

Oya Energy Hybrid Facility EIA and Grid Connection BA (2020-2021)

Completed the Environmental Impact Assessment, Basic Assessment, and associated Amendment Processes for the 128MW facility, which included powerlines, wind energy facility (WEF), solar photovoltaic (PV), Battery Energy Storage System (BESS) and fuel-based generators (FBG).

Liandra project managed the processes and assisted the client in compiling and submitting the bid for RMIPPPP. The project is a preferred bidder for the RMIPPPP

Kudusberg Wind Energy Facility (WEF) Amendment (2020-2021)

Completed the Amendment Process for getting the facility bid ready, this included finalizing layouts and EMPrs.

Droogfontein 3 PV BESS BA (2020)

Completed the Basic Assessment for Battery Energy Storage System (BESS). Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.

Mierdam PV BESS BA (2020)	Completed the Basic Assessment for Battery Energy Storage System (BESS). Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Dwarsrug WEF BESS BA (2020)	Completed the Basic Assessment for Battery Energy Storage System (BESS). Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Platsjambok East PV BESS BA (2020)	Completed the Basic Assessment for Battery Energy Storage System (BESS). Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Platsjambok West PV BESS BA (2020)	Completed the Basic Assessment for Battery Energy Storage System (BESS). Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Loeriesfontein 3 PV BESS BA (2020)	Completed the Basic Assessment for Battery Energy Storage System (BESS). Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Grid connection for between the Dwarsrug WEF to Loeriesfontein PV	Completed the Basic Assessment for the Grid connection. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Tooverberg Wind Energy Facility (WEF) EIA and Grid Connection BA (2018-2019)	Assisted in completing the EIA and BA Processes for the facility. Liandra undertook technical and report writing and client liaison when the original project manager left.
Rondekop Wind Energy Facility (WEF) EIA (2018-2019)	Completed the EIA Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Umsobomvu PV Project EIAs (x3) and Grid Connections Bas (x3) near Noupoot and Middelburg, Eastern and Northern Cape Provinces (2018-2020)	Completed the Amendment Process for the facilities. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Amendments for the proposed development of the Hartebeest Leegte Wind Farm near Loeriesfontein, Northern Cape Province (2019)	Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.
Amendments for the development of the Graskoppies Wind Farm and grid near Loeriesfontein, Northern Cape Province (2019)	Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.

<p>Amendments for the proposed development of the Ithemba Wind Farm near Loeriesfontein, Northern Cape Province (2019)</p>	<p>Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.</p>
<p>Amendments for the proposed development of the Xha! Boom Wind Farm near Loeriesfontein, Northern Cape Province (2019)</p>	<p>Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.</p>
<p>Amendment for the Proposed Beaufort West Wind Farm, Western Cape Province (2019)</p>	<p>Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.</p>
<p>Amendment for the Proposed Trakas Wind Farm, Western Cape Province (2019)</p>	<p>Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.</p>
<p>Amendments for the Proposed Dwarsrug Wind Farm near Loeriesfontein, Northern Cape Province</p>	<p>Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.</p>
<p>Amendments for the Grid Connections for Graskoppies, Haratebeest Leegte, Itemba and !Xha Boom Wind Energy Facilities near Loeriesfontein, Northern Cape Province</p>	<p>Completed the Amendment Process for the facility. Liandra project managed the processes as well as undertaking technical and report writing, public participation, specialist team management.</p>
<p>Regulation 54 Audits (2019)</p>	<ul style="list-style-type: none"> • Darling Wind Energy Facility, Western Cape Province • Great Kei Wind Energy Facility, Eastern Cape Province • Motherwell Wind Energy Facility, Eastern Cape Province • Ncora Wind Energy Facility, Eastern Cape Province • Nqamakwe Wind Energy Facility, Northern Cape Province • Peddie Wind Energy Facility, Eastern Cape Province • Ukomeleza Wind Energy Facility, Eastern Cape Province • Umsobomvu Wind Energy Facility, Northern and Eastern Cape Provinces
<p>MEMBERSHIPS</p>	
<p>SACNASP</p>	<p>Registered with South African Council for Natural Scientific Professions as a Professional Natural Scientist (Pr.Sci.Nat) in Environmental Science (117442)</p>
<p>IAIASa</p>	<p>Member of the International Association of Impact Assessors (3624)</p>

PUBLICATIONS

Lang P, Taylor J, Bertolli L, Lowe S, Dallas H, Kennedy MP, Gibbins C, Sichingabula H, Saili, Day J, Willems F, Briggs JA and Murphy KJ 2013. Proposed procedure for the sampling, preparation and analysis of benthic diatoms from Zambian rivers: a bioassessment and decision support tool applicable to freshwater ecoregions in tropical southern Africa. Africa, Caribbean, Pacific-European Union Project Report.

Martins S, Kennedy M, Lowe S, Lang P, Briggs J, Dallas H, Taylor J, Bertolli L, Gibbins C, Soulsby C, Day J, Sichingabula H, Saili H, Kapungwe E, Willems F, Mbulwe F, Murphy K. 2013. SAFRASS Methodology Manual.

Shrader AM, Bell C, Bertolli L and Ward D 2012. Forest or the trees: at what scale do elephants make foraging decisions? *Acta Oecologica* 42: 3-10.

Lang P, Taylor J, Bertolli L, 2012. River diatom biodiversity assessments in Zambian rivers: a SAFRASS conservation perspective. European Congress of Conservation Biology, Glasgow.

Martins S, Kennedy M, Lowe S, Lang P, Briggs J, Dallas H, Taylor J, Bertolli L, Gibbins C, Soulsby C, Day J, Sichingabula H, Saili H, Kapungwe E, Willems F, Mbulwe F, Murphy K. 2012. SAFRASS Photographic guide to the Aquatic Macroinvertebrates of Zambia. European Union Project Report

CURRICULUM VITAE



STEPHAN JACOBS

ENVIRONMENTAL CONSULTANT

EMPA, Durban

QUALIFICATIONS

B.Sc. Hons	2014	Environmental Management and Analysis
B.Sc.	2012- 2013	Environmental Sciences

EXPERTISE

- Environmental Impact Assessments (EIAs), particularly Renewable Energy developments
- Basic Assessments (BAs), particularly Renewable Energy developments
- Environmental Compliance Monitoring

Stephan has six years of experience in undertaking Environmental Impact Assessment (EIA) and Basic Assessment (BA) processes for various types of projects. For the majority of his career he has focussed on renewable energy projects which form part of South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) as well as the 2020 Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP). He was one of the main consultants who worked on the EIA for a project that was chosen as a preferred bidder as part of the December 2020 RMIPPPP and which will be Africa's largest hybrid energy facility once constructed. Stephan also has experience in undertaking and facilitating public participation and stakeholder engagement processes, particularly for renewable energy developments. He has in the past undertaken field work and the compilation of reports for specialist studies such as Surface Water and Visual Impact Assessments. Stephan also has considerable experience in Environmental Compliance and Auditing and have acted as an Environmental Control Officer (ECO) for several infrastructure projects.

PROJECTS

BAs for four (4) Substations, Linking Substations and associated 132kV Power Lines, South Africa, South Africa, Mainstream Renewable Power Developments (2016-2018)

BASIC ASSESSMENTS (BAs) FOR RENEWABLE ENERGY PROJECTS

Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake four (4) BA processes for four (4) Substations, Linking Substations and Associated 132kV power lines to serve four (4) respective 235MW wind farms in the Northern Cape Province. The BAs included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna monitoring, visual, social, noise, geotechnical, transportation and heritage baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of BA Reports and EMPs. EMI and RFI assessments were also undertaken.

<p>BA for a 264MW WEF, South Africa, ENERTRAG (2017-2019)</p>	<p>Environmental Consultant assisting project Leader / Lead Environmental Consultant to undertake a BA process for a 264MW Wind Energy Facility (WEF) and associated infrastructure near Touws River in the Western Cape Province. Also assisted in facilitating public participation process. The BA included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna and bat monitoring, visual, social, noise, geotechnical, transportation, heritage and Palaeontology baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of a BA Report and EMPr.</p>
<p>BA for an On-site Eskom Substation and 132kV Power Line to serve a 264MW Wind Energy Facility (WEF), South Africa, ENERTRAG (2017-2019)</p>	<p>Environmental Consultant assisting project Leader / Lead Environmental Consultant to undertake a BA for an on-site Eskom substation and 132kV power line to serve a 264MW Wind Energy Facility (WEF) near Touws River, Western Cape Province. Also assisted in facilitating public participation process. BA included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna and bat monitoring, visual, social, noise, geotechnical, transportation, heritage and Palaeontology baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of a BA Report and EMPr.</p>
<p>BA for 132kV Power Line, South Africa, G7 Renewable Energies (2020 – 2021)</p>	<p>One (1) of the Lead Environmental Consultants undertaking the BA process for a 132kV power line to serve renewable energy facilities near Matjiesfontein, Western and Northern Cape Provinces. Also took part in facilitating public participation process. BA included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna monitoring, visual, social, noise and heritage baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of a BA Report and EMPr.</p>
<p>BA for 132kV Powerlines between an authorised PV Solar Energy Facility, Wind Energy Facility and a Substation, South Africa, Mainstream Renewable Power (2020)</p>	<p>Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake the BA process for 132kV Powerlines between authorised PV Solar Energy and Wind Energy facilities, and from the authorised Wind Energy Facility to an authorised Substation. Project located near Loeriesfontein in the Northern Cape Province of South Africa. BA included several baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of a BA Report and EMPr.</p>
<p>BA for four (4) 9.9MW Solar PV Plants, two (2) 132kV power lines and associated infrastructure, South Africa, Confidential Client (2020-2021)</p>	<p>Lead Environmental Consultant and Public Participation Facilitator undertaking four (4) BA and Public Participation processes for four (4) 9.9MW Solar Photovoltaic (PV) Plants, which included two (2) 132kV power lines, and associated infrastructure near Leeudoringstad in the North West Province. BAs included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna monitoring, visual, social, geotechnical, transportation, heritage and Palaeontology baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of BA Reports and EMPrs.</p>
<p>BA for 132/11kV Solar Plant Substation, South Africa, Confidential Client (2020-2021)</p>	<p>Lead Environmental Consultant and Public Participation Facilitator undertaking a BA and Public Participation process for 132/11kV Solar Plant Substation near Leeudoringstad in the North West Province. BA included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna monitoring, visual, social, geotechnical, transportation, heritage and Palaeontology baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of a BA Report and EMPr.</p>

<p>BA for 800MW Solar PV Facility, South Africa, G7 Renewable Energies (2020)</p>	<p>One (1) of the Lead Environmental Consultants undertaking the BA process for an 800MW Solar Photovoltaic (PV) Facility and associated Infrastructure near Matjiesfontein, Western Cape Province. Also assisted in facilitating the Public Participation process. BAs included soils & agricultural potential, air quality, terrestrial and aquatic biodiversity, avifauna and bat monitoring, visual, social, geotechnical, transportation, glint and glare, noise, heritage, cultural landscapes and Palaeontology baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of a BA Report and EMPr. A major hazardous installation assessment was also undertaken.</p>
	<p>ENVIRONMENTAL IMPACT ASSESSMENTS (EIAs) FOR RENEWABLE ENERGY PROJECTS</p>
<p>EIAs for four (4) 235MW Wind Farms South Africa, Mainstream Renewable Power Developments (2016-2018)</p>	<p>Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake four (4) EIA processes for four (4) 235MW wind farms near Loeriefontein in the Northern Cape Province. Also assisted in facilitating the Public Participation process. EIAs included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna and bat monitoring, visual, social, noise, geotechnical, transportation and heritage baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of EIA Reports and EMPrs. EMI and RFI assessments were also undertaken. EMI and RFI assessments were also undertaken.</p>
<p>EIA for a 325MW Wind Energy Facility South Africa, G7 Renewable Energies (2018-2019)</p>	<p>Environmental Consultant assisting Project Leader / Lead Environmental Consultant undertake EIA process for a 325MW Wind Energy Facility between Matjiesfontein and Sutherland, Northern Cape Province. EIA included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna and bat monitoring, visual, social, noise, transportation and heritage (including palaeontology, archaeology & cultural landscape) baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of an EIA Report and EMPr.</p>
<p>EIAs for three (3) 400MW Solar PV Energy Facilities, South Africa, EDF Renewables South Africa (2018-2020)</p>	<p>Project Leader / Lead Environmental Consultant and Public Participation Facilitator undertaking three (3) EIA and Public Participation processes for three (3) solar PV energy facilities, including associated infrastructure, with capacities up to 400MW respectively. EIAs included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna monitoring, visual, social, transportation, heritage and palaeontology baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of EIA Reports and EMPrs.</p>
<p>EIA for 301MW Hybrid Energy Facility and associated infrastructure, South Africa, G7 Renewable Energies (2020-2021)</p>	<p>One (1) of the Lead Environmental Consultants and main Public Participation Facilitator undertaking the EIA and Public Participation processes for a 301MW Hybrid Energy Facility. Hybrid Energy facility consists of a solar PV facility, BESS and Fuel-Based Generator Facility (FBGF). EIA included soils & agricultural potential, terrestrial and aquatic biodiversity, avifauna and bat monitoring, visual, social, transportation, geotechnical, heritage and palaeontology, glint and glare, air quality and climate change baseline studies, as well as stakeholder engagement (i.e., public participation) and the compilation of an EIA Report and EMPr. A major hazardous installation assessment was also undertaken. Preferred bidder project as part of December 2020 RMIPPPP and will be Africa’s largest hybrid energy facility once constructed.</p>
	<p>PART 1 ENVIRONMENTAL AUTHORISATION (EA) AMENDMENT PROCESSES FOR RENEWABLE ENERGY PROJECTS</p>

<p>Part 1 EA Amendment Process for an authorised 140MW Wind Energy Facility, South Africa, Mainstream Renewable Power (2020-2021)</p>	<p>One (1) of the Lead Environmental Consultants undertaking the Part 1 EA amendment process for an authorised 140MW Wind Energy Facility near Loeriesfontein in the Northern Cape Province. Amendments were administrative and therefore only an application was required to be submitted to the Department.</p>
<p>Part 1 EA Amendment Process for four (4) authorised PV Solar Energy Facilities, South Africa, Mainstream Renewable Power (2020-2021)</p>	<p>One (1) of the Lead Environmental Consultants undertaking the Part 1 EA Amendment Processes for four (4) authorised PV Solar Energy Facilities near Loeriesfontein and Prieska in the Northern Cape Province. Amendments were administrative and therefore only an application was required to be submitted to the Department.</p>
<p>PART 2 ENVIRONMENTAL AUTHORISATION (EA) AMENDMENT PROCESSES FOR RENEWABLE ENERGY PROJECTS</p>	
<p>Part 2 EA Amendment Process for a 140MW WEF and associated infrastructure, South Africa, BTE Renewables (formally known as BioTherm Energy) (2018-2019)</p>	<p>Project Lead / Lead Environmental Consultant undertaking the Part 2 EA amendment process for an authorised 140MW WEF near Copperton in the Northern Cape Province. Amendment included increasing the turbine specifications (i.e., hub height and rotor diameter) and generation output. Amendments included further assessment in terms of the Path Loss and Risk Assessment which was undertaken as part of the original EIA processes. Process also included stakeholder engagement (i.e., public participation) and EMPr updates.</p>
<p>Part 2 EA Amendment Processes for three (3) 140 MW Wind Farms, South Africa, Mainstream Renewable Power (2018-2019)</p>	<p>One (1) of the Lead Environmental Consultants undertaking the respective Part 2 EA Amendment processes for two (2) authorised 140 MW Wind Farms near Beaufort West in the Western Cape Province and one (1) authorised 140MW Wind Farm near Loeriesfontein in the Northern Cape Province. Amendments involved increasing the turbine hub height and rotor diameters. Avifauna, Bat, Noise and Visual specialists were commissioned to assess the impacts of the proposed amendments. Process included stakeholder engagement (i.e., public participation) and EMPr updates.</p>
<p>Part 2 EA Amendment Processes for four (4) 235MW Wind Farms, South Africa, Mainstream Renewable Power (2018-2019)</p>	<p>One (1) of the Lead Environmental Consultants undertaking the respective Part 2 EA Amendment processes for four (4) authorised 235MW Wind Farms near Loeriefontein, Northern Cape Province. Amendments involved increasing the turbine hub height and rotor diameters. Avifauna, Bat, Noise and Visual specialists were commissioned to assess the impacts of the proposed amendments. Process included stakeholder engagement (i.e., public participation) and EMPr updates.</p>
<p>Part 2 EA Amendment Process for a 325MW WEF and Associated Infrastructure, South Africa, G7 Renewable Energies (2020-2021)</p>	<p>One (1) of the Lead Environmental Consultants undertaking the Part 2 EA Amendment process for an authorised 325MW WEF and associated Infrastructure, between Matjiesfontein and Sutherland in the Western and Northern Cape Provinces. Amendments involved splitting an authorised WEF into two (2) separate WEFs, one (1) northern WEF and one (1) southern. Soils & agricultural potential, avifauna, bat, terrestrial ecology, heritage, palaeontology, noise, socio-economic, surface water, transport and Visual specialists were commissioned to assess the impacts of the proposed amendments. Process included stakeholder engagement (i.e., public participation) and EMPr updates.</p>

	VISUAL IMPACT ASSESSMENTS (VIAs) FOR RENEWABLE ENERGY PROJECTS
VIA for a 75MW Solar PV Plant, South Africa, BTE Renewables (formally known as BioTherm Energy) (2015)	Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report as part of the VIA for a 75MW Solar PV Plant near Copperton in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.
VIAs for three (3) 75MW Solar PV Energy Facilities, South Africa, BTE Renewables (formally known as BioTherm Energy) (2016)	Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports as part of the VIAs for three (3) 75MW Solar PV Energy Facilities near Vryburg in the North West Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.
VIAs for the proposed construction of a 400kV Substation and associated 400kV Power Line, South Africa, BTE Renewables (formally known as BioTherm Energy) (2016)	Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the VIAs for a 400kV Substation and associated 400kV power line near Vryburg in the North West Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.
VIAs for two (2) 75MW Solar PV Energy Facilities, South Africa, BTE Renewables (formally known as BioTherm Energy) (2016)	Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the VIAs for two (2) 75MW Solar PV Energy Facilities near Lichtenburg in the North West Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.
VIAs for two (2) 132kV Substations and associated 132kV power lines, South Africa, BTE Renewables (formally known as BioTherm Energy) (2016)	Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the VIAs for two (2) 132kV substations and associated 132kV power lines near Lichtenburg in the North West Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.
VIA for a 3000MW Wind Farm, South Africa, Confidential Client (2017)	Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for a 3000MW Wind Farm and associated infrastructure near the town of Richmond in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the projects.

<p>VIA for two (2) 140MW Wind Energy Facilities, South Africa, BTE Renewables (formally known as BioTherm Energy) (2016)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the VIAs for two (2) 140MW Wind Energy Facilities near Copperton in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.</p>
<p>VIA for a 132kV substation and associated 132kV power line, South Africa, BTE Renewables (formally known as BioTherm Energy) (2016)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for a 132kV substation and associated 132kV power line near Copperton in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>VIA for a 400kV substation and 400kV power line, South Africa, BTE Renewables (formally known as BioTherm Energy) (2016)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for a 400kV Substation and 400kV power line near Copperton in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>VIAs for four (4) 235MW Wind Farms, South Africa, Mainstream Renewable Power (2016-2017)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the VIAs for four (4) 235MW Wind Farms near Loeriesfontein in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.</p>
<p>Basic VIAs for four (4) 33kV/132kV Substations, 132kV Linking Substations and associated 132kV Power Lines, South Africa, Mainstream Renewable Power (2016-2017)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the Basic VIAs for four (4) 33/132kV substations, 132kV linking substations and associated 132kV power lines near Loeriesfontein in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.</p>
<p>VIA for a 315MW Wind Energy Facility, South Africa, Phezukomoya Wind Power (2017)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for a 315MW Wind Energy Facility near Noupoot in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>VIA for a 390MW Wind Energy Facility, South Africa, San Kraal Wind Power (2017)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for a 390MW Wind Energy Facility near Noupoot in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>

<p>VIA for two (2) 4.5MW Wind Energy Facilities, South Africa, Mulilo Renewable Project Developments (2018)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the VIAs for two (2) 4.5MW Wind Energy Facilities near Kuruman in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.</p>
<p>Basic VIA for supporting electrical infrastructure to two (2) 4.5MW Wind Energy Facilities, Mulilo Renewable Project Developments (2018)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment reports for the Basic VIAs for supporting electrical infrastructure to two (2) 4.5MW Wind Energy Facilities near Kuruman in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA reports. Reports were reviewed and approved by the Visual specialist appointed for the projects.</p>
<p>VIA for a 325MW Wind WEF, South Africa, G7 Renewable Energies (2018)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for a 325MW WEF between Matjiesfontein and Sutherland in the Northern and Western Cape Provinces. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>Basic VIA for an up to 132kV Power Line and Associated Infrastructure for the Rooipunt Solar Thermal Power Plant, South Africa, SolarReserve SA (2016)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the Basic VIA for an up to 132kV power line and associated infrastructure for the Rooipunt Solar Thermal Power Plant near Upington in the Northern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>Basic VIA for an up to 132kV Power Line and Associated Infrastructure for the proposed Kalkaar Solar Thermal Power Plant, South Africa, SolarReserve SA (2016)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the Basic VIA for an up to 132kV power line and associated Infrastructure for the proposed Kalkaar Solar Thermal Power Plant near Kimberly in the Free State and Northern Cape Provinces. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>VISUAL IMPACT ASSESSMENTS (VIAs) FOR INFRASTRUCTURE PROJECTS</p>	
<p>VIA for Nsoko Msele Integrated Sugar Project, Swaziland, Confidential Client (2015)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for the Nsoko Msele Integrated Sugar Project in Swaziland. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>

<p>VIA for Tinley Manor South Banks Beach Enhancement Solution, South Africa, Tongaat Hulett Developments (2015)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for the Tinley Manor South Banks Beach Enhancement Solution in the KwaZulu-Natal Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>VIA for Mlonzi Hotel and Golf Estate Development, South Africa, Confidential Client (2018)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for the Mlonzi Hotel and Golf Estate Development near Lusikisiki in the Eastern Cape Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>VIA for Assagay Valley Development, South Africa, Confidential Client (2018)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for VIA for the Assagay Valley Development in the KwaZulu-Natal Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p>VIA for Kassier Road North Development, South Africa, Confidential Client (2018)</p>	<p>Assisted Visual Specialist by undertaking fieldwork / ground-truthing and compiling impact assessment report for the VIA for the Kassier Road North Development in the KwaZulu-Natal Province. Tasks involved undertaking the desktop screening, fieldwork / ground-truthing component and compiling and updating the VIA report. Report was reviewed and approved by the Visual specialist appointed for the project.</p>
<p style="text-align: center;">ENVIRONMENTAL CONTROL OFFICER (ECO) MONITORING / AUDITING PROJECTS</p>	
<p>ECO for Polokwane IRPTS, South Africa, Polokwane Municipality (2015)</p>	<p>Acted as ECO for the Polokwane Integrated Rapid Public Transport System (IRPTS) project in the Limpopo Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also attended monthly site meetings with project team and reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department.</p>
<p>ECO for Phase 1 and Phase 2 of Newmarket Retail Development, South Africa, Rejem Property Development (2015-2016)</p>	<p>Acted as ECO for Phase 1 and Phase 2 of the Newmarket Retail Development in the Gauteng Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also attended monthly site meetings with project team and reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department. Also regularly liaised with relevant environmental department.</p>

<p>ECO for NuPay Office Block at Newmarket Retail Development, South Africa, Rejem Property Development (2017-2018)</p>	<p>Acted as ECO for the NuPay Office Block development at the Newmarket Retail Development in the Gauteng Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also attended monthly site meetings with project team and reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department. Also regularly liaised with relevant environmental department.</p>
<p>ECO for Decathlon Building at the Newmarket Retail Development, South Africa, Rejem Property Development (2018)</p>	<p>Acted as ECO for the construction of the Decathlon Building at the Newmarket Retail Development in the Gauteng Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also attended monthly site meetings with project team and reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department. Also regularly liaised with relevant environmental department.</p>
<p>ECO for external road upgrades at the Newmarket Retail Development, South Africa, Rejem Property Development (2018)</p>	<p>Acted as ECO for the external road upgrades at the Newmarket Retail Development in the Gauteng Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also attended monthly site meetings with project team and reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department. Also regularly liaised with relevant environmental department.</p>
<p>ECO for Netcare Alberton Hospital Development as part of the Greater Newmarket Development, South Africa, Rejem Property Development (2019-2020)</p>	<p>Acted as ECO for the Netcare Alberton Hospital Development as part of the Greater Newmarket Development in the Gauteng Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also attended monthly site meetings with project team and reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department. Also regularly liaised with relevant environmental department.</p>
<p>ECO for Kwagqikazi TVET College Campus Development, South Africa, Department of Higher Education (2021)</p>	<p>Acted as ECO for the Kwagqikazi TVET College Campus Development in Nongoma, KwaZulu-Natal Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department.</p>

<p>ECO for Greytown TVET College Campus Development, South Africa, Department of Higher Education (2021)</p>	<p>Acted as ECO for the Greytown TVET College Campus Development in Greytown, KwaZulu-Natal Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also reported back on environmental non-compliances (including recommendations). Also involved with the compilation of monthly audit reports which were submitted to Project Team and relevant environmental department.</p>
<p>ECO for Vulamehlo Rural Housing Project, South Africa, Confidential Client (2021)</p>	<p>Acted as ECO for the Vulamehlo Rural Housing Project in the KwaZulu-Natal Province. Tasks involved undertaking site inspections / audits of the site camp and construction site every month as duty of care, in accordance with the National Environmental Management Act (Act No. 107 of 1998). Also reported back on environmental non-compliances (including recommendations). Also involved with the compilation of audit reports which were submitted to Project Team.</p>
<p>ECO for Ntuzuma D Phase 2 and 3 Housing Projects, South Africa, Confidential Client (2021)</p>	<p>Acted as ECO for the Ntuzuma D Phase 2 and 3 Housing Project, within the eThekweni Municipality of the KwaZulu-Natal Province. Tasks involved undertaking monthly site inspections / audits of the site camp and construction site to ensure compliance with the conditions of the EA and recommendations set out in the EMPr. Also attended monthly virtual site meetings with project team and reported back on environmental non-compliances (including recommendations). Also compiled monthly audit reports which were submitted to Project Team and relevant environmental department.</p>
<p>BASIC ASSESSMENTS (BAS) FOR INFRASTRUCTURE PROJECTS</p>	
<p>BA for a Non-Motorised Transport (NMT) Training and Recreational Park adjacent to the Peter Mokaba Stadium, South Africa, Confidential Client (2015)</p>	<p>Graduate Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake a BA process for a Non-Motorised Transport (NMT) Training and Recreational Park adjacent to the Peter Mokaba Stadium in Polokwane within the Limpopo Province. The BA included terrestrial and aquatic biodiversity, visual, social and heritage baseline studies, stakeholder engagement and compilation of a BA Report and EMPr.</p>
<p>BA for expansion of the Tissue Manufacturing Capacity at the Twinsaver Kliprivier Operations Base, South Africa, Twinsaver Group (2016)</p>	<p>Graduate Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake a BA process for the expansion of the Tissue Manufacturing Capacity at the Twinsaver Kliprivier Operations Base in the Gauteng Province. The BA included surface water, heritage and air-quality baseline studies, stakeholder engagement and compilation of a BA Report and EMPr.</p>
<p>BA for new SPAR Distribution Centre in Port Elizabeth, South Africa, the SPAR Group (2018)</p>	<p>Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake the BA process for the construction of a new SPAR Distribution Centre at Redhouse in Port Elizabeth. The BA included surface water, heritage and air-quality baseline studies, stakeholder engagement and compilation of a BA Report and an EMPr.</p>
<p>ENVIRONMENTAL SCREENING / ENVIRONMENTAL REVIEW / ENVIRONMENTAL DUE DILIGENCE PROJECTS</p>	

<p>Environmental Review of Xakwa Coal Operations, South Africa, Confidential Client (2021)</p>	<p>Graduate Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake an environmental review and provide a professional opinion for the Xakwa Coal Operations, adjacent to the Eastside Junction Development. Tasks involved reviewing the activities associated with the proposed project and providing feedback (in the form of a report) whether there are any environmental constraints and/or fatal flaws preventing development.</p>
<p>Environmental Due Diligence for the Woodlands and Harrowdene Office Parks, South Africa, Growthpoint Properties (2016)</p>	<p>Graduate Environmental Consultant assisting Project Leader / Lead Environmental Consultant to undertake an environmental due diligence for the Woodlands and Harrowdene Office Parks in Woodmead within the Gauteng Province. Tasks involved undertaking a site visit at the Woodlands and Harrowdene Office Parks and providing feedback / confirmation whether there are any non-compliance issues from an environmental perspective. Also involved reviewing future planned activities within office parks and providing feedback whether there are any environmental constraints and/or fatal flaws preventing future development.</p>
<p>SURFACE WATER ASSESSMENTS FOR INFRASTRUCTURE PROJECTS</p>	
<p>Surface Water Assessment for Steve Thswete Local Municipality, South Africa, Steve Thswete Local Municipality (2015)</p>	<p>Assisted Surface Water Specialist with undertaking Surface Water Assessment for the Steve Thswete Local Municipality within the Mpumalanga Province. Tasks involved undertaking the desktop screening and assisting with the compilation of a surface water impact assessment report.</p>
<p>Surface Water Delineation and Assessment for a coal Railway Siding and associated road upgrade, South Africa, Confidential Client (2015)</p>	<p>Assisted Surface Water Specialist with undertaking a Surface Water Delineation and Assessment for a coal Railway Siding at the Welgedacht Marshalling Yard and associated Milner Road Upgrade within the Ekurhuleni Metropolitan Municipality. Tasks involved undertaking the desktop screening and assisting with the compilation of a surface water impact assessment report.</p>

APPENDIX 3: CHANCE FIND FOSSIL PROCEDURE

Beaufort West Cluster wind farms: 33kV / 132 kV substation, 132 kV powerline and associated infrastructure	
Province & region:	Western Cape: Central Karoo District Municipality
Responsible Heritage Resources Agency	Heritage Western Cape (3 rd Floor Protea Assurance Building, 142 Longmarket Street, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 021 483 5959 Email: ceoheritage@westerncape.gov.za)
Rock unit(s)	Abrahamskraal Formation (Lower Beaufort Group), Late Caenozoic alluvium / eluvium / soils.
Potential fossils	Fossil vertebrate bones, teeth, trace fossils, trackways, petrified wood, plant-rich beds in the Lower Beaufort Group bedrocks. Fossil mammal bones, teeth, horn cores, freshwater molluscs, plant material, trace fossils in Late Caenozoic sediments.
ECO protocol	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (N.B. safety first!), safeguard site with security tape / fence / sandbags if necessary.
	2. Record key data while fossil remains are still <i>in situ</i> : <ul style="list-style-type: none"> • Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo • Context – describe position of fossils within stratigraphy (rock layering), depth below surface • Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (e.g. rock layering)
	3. If feasible to leave fossils <i>in situ</i> : <ul style="list-style-type: none"> • Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation • Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume
	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <ul style="list-style-type: none"> • <i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock) • Photograph fossils against a plain, level background, with scale • Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags • Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist • Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
	4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.

APPENDIX 4: ESKOM REQUIREMENTS