

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



environmental affairs

Department:
Environmental Affairs
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 activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 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	<p>Contains generally accepted impact management outcomes and impact 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	Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA

Part	Section	Heading	Content
			<p>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 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.</p>

Part	Section	Heading	Content
			<p>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>
Appendix 1			<p>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.</p>

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	Environmental 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&AP's	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></p> <p>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.

Responsible Person(s)	Role and Responsibilities
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> <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> 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&AP's), 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</p>

Responsible Person(s)	Role and Responsibilities
	<p>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> <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;

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> - 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; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.
<p>developer Environmental Officer (dEO)</p>	<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;

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> - 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 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.

Responsible Person(s)	Role and Responsibilities
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; - 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 understands 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
<ul style="list-style-type: none"> - All staff must receive environmental awareness training prior to commencement of the activities; - The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; - Refresher environmental awareness training is available as and when required; - 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; - The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: <ul style="list-style-type: none"> a) Safety notifications; and b) No littering. - Environmental awareness training must include as a minimum the following: <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 	<p>dEO / cEO</p>	<ul style="list-style-type: none"> • Provide training to all personnel • Erect information posters • File record of training 	<ul style="list-style-type: none"> • Before workers start working on-site • Before new activities are undertaken 	<p>ECO</p>	<p>Monthly</p>	<ul style="list-style-type: none"> • Keep record of training provided • Check training attendance register • Observe whether activities are executed in line with EMPr requirements

<p>within sensitive areas;</p> <ul style="list-style-type: none"> f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. <ul style="list-style-type: none"> - A record of all environmental awareness training courses undertaken as part of the EMPr must be available; - Educate workers on the dangers of open and/or unattended fires; - A staff attendance register of all staff to have received environmental awareness training must be available. - Course material must be available and presented in appropriate languages that all staff can understand. 					
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5.2 Site Establishment development

Impact management outcome: Impacts on the environment are minimised 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
<ul style="list-style-type: none"> - 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 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 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; - Sites must be located where possible on previously disturbed areas; - The camp must be fenced in accordance with Section 5.5: Fencing and gate installation; and - The use of existing accommodation for contractor staff, where possible, is encouraged. 	dEO / cEO	As defined and stipulated in a Method Statement.	<ul style="list-style-type: none"> • Submit to ECO no less than 7 days prior to intended date of commencing an activity. • Prior to the establishment of a new construction camp. 	ECO	Monthly	<ul style="list-style-type: none"> • Accepted method statement • Site camp suitably fenced • Signage in place.

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
<ul style="list-style-type: none"> – Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; – 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 – Unauthorised access and development related activity inside access restricted areas is prohibited. 	dEO / cEO	As defined and stipulated in a Method Statement.	Start of construction in a new area.	ECO	Monthly / Start of construction in a new area.	<ul style="list-style-type: none"> • Check no-go areas are demarcated. • Check for evidence of disturbance in no-go 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
<ul style="list-style-type: none"> – An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – 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 – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the 	dEO / cEO	Signed agreement between DPM, Contractor and Landowner.	Prior to the use of access roads.	ECO	Monthly	<ul style="list-style-type: none"> • Filed signed agreement between DPM, Contractor and Landowner. • Check condition of the private roads. • Check private roads are reinstatement to at least the original condition. • Check that areas where vegetation

<p>development of new roads;</p> <ul style="list-style-type: none"> - 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; - Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands - Access roads must only be developed on a pre-planned and approved roads. 						<p>has been encroached upon has been re-vegetated.</p> <ul style="list-style-type: none"> • Check that only approved access roads are used.
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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
<ul style="list-style-type: none"> - Use existing gates provided to gain access to all parts of the area authorised for development, where possible; - Existing and new gates to be recorded and documented in accordance with section 4.9: photographic record; - All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; - At points where the line crosses a 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; - 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; - Where gates are installed in jackal proof fencing, a suitable 	dEO / cEO	<ul style="list-style-type: none"> • Photograph existing and new gates. • Lock all gates during construction, unless otherwise agreed with the landowner. • Obtain approval from landowners for the installation of gates, where required. • Re-electrify fencing. • Maintain fencing and barriers. • Removal all temporary fencing upon completion of 	Start of construction	ECO	Monthly	<ul style="list-style-type: none"> • Check photographic record. • Check if gates are locked. • Check approval has been obtained from landowners. • Check that electrified fencing is re-electrified. • Check that fences are being maintained. • Check that approval has been obtained from the landowner to erect fencing to restrict movement of livestock. • Check that all

<p>reinforced concrete sill must be provided beneath the gate;</p> <ul style="list-style-type: none"> - Original tension must be maintained in the fence wires; - All gates installed in electrified fencing must be re-electrified; - All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities; - Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; - Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. - All fencing must be developed of high quality material bearing the SABS mark; - The use of razor wire as fencing must be avoided; - 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; - On completion of the development phase all temporary fences are to be removed; - The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely. 		<p>construction.</p>				<p>temporary fencing has been removed appropriately upon completion of construction.</p>
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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; - 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. - 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. <p>The use of grey water is encouraged.</p>	dEO / CEO	<ul style="list-style-type: none"> • Ensure relevant permits and licenses are obtained for water abstraction. • As defined and stipulated in a Method Statement. 	Throughout construction	ECO	Monthly	<ul style="list-style-type: none"> • Check pollution control measures installed at areas where effluent is generated or stored. • Check for evidence of water wastage. • Check that water is recycled and reused where possible.

5.7 Storm and waste water 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
<ul style="list-style-type: none"> - 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; - 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; - Natural storm water 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; - 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. 	dEO / cEO	<ul style="list-style-type: none"> • Contain contaminated water for treatment or disposal at an approved location. • Remediate spills of oil or concrete. • Install a settling pond, if required 	Throughout construction.	ECO	Monthly	<ul style="list-style-type: none"> • Check for evidence of on-site disposal. • Check effluent from cement batching is controlled and collected. • Check that spills have been addressed as specified. • Check availability of remediation material. • Check pollution control measures installed at areas where effluent is generated or stored. • Check the used of settling ponds on site.

5.8 Solid and hazardous waste management

Impact management outcome: Waste is 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
<ul style="list-style-type: none"> - All measures regarding waste management must be undertaken using an integrated waste management approach; - Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; - A suitably positioned and clearly demarcated waste collection site must be identified and provided; - The waste collection site must be maintained in a clean and orderly manner; - Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; - Staff must be trained in waste segregation; - Bins must be emptied regularly; - General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; - Hazardous waste must be disposed of at a registered waste disposal site; - Certificates of safe disposal for general, hazardous and recycled waste must be maintained. 	dEO / cEO	<ul style="list-style-type: none"> • Identify and demarcate waste collection area. • Ensure waste is separated into labelled waste bins (e.g. recycling). • Include waste segregation in environmental awareness training. • File all waste disposal receipts. 	Throughout construction.	ECO	Monthly	<ul style="list-style-type: none"> • Check bins provided on site. • Check designated waste storage area. • Check records of recycling waste. • Check waste disposal receipts.

5.9 Protection of watercourses and estuaries

<p>Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.</p>					
Impact Management Actions	Implementation			Monitoring	
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Evidence of compliance
<ul style="list-style-type: none"> - 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; - In the event of a spill, prompt action must be taken to clear the polluted or affected areas; - Where possible, no development equipment must traverse any seasonal or permanent wetland - No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur; - Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; - There must not be any impact on the long term morphological dynamics of watercourses or estuaries; - Existing crossing points must be favored over the creation of new crossings (including temporary access) - When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: <ul style="list-style-type: none"> • Water levels during the period of construction; • No altering of the bed, banks, course or characteristics of a watercourse • 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 	<p>Not Applicable</p>				

<p>maintained;</p> <ul style="list-style-type: none"> • 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 – 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. 	
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5.10 Vegetation clearing

<p>Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>General:</p> <ul style="list-style-type: none"> – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – 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; – Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be filed; – 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; 	dEO / cEO	<ul style="list-style-type: none"> • Restrict vegetation clearance to the immediate development footprint. • Obtain necessary permits for the relocation and / or destruction of any protected trees. • Demarcate the construction footprint with visible barriers (i.e. safety tape / fencing). • Erect signage to demarcate the construction footprint. • Designate areas outside the 	Prior to construction	ECO	Monthly	<ul style="list-style-type: none"> • Check size of area cleared relative to development footprint • Check size of area disturbed outside of construction site boundary • Check Permit on file.

<ul style="list-style-type: none"> - Trees felled due to construction must be documented and form part of the Environmental Audit Report; - Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; - 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; - A daily register must be kept of all relevant details of herbicide usage; - No herbicides must be used in estuaries; - 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. 		<p>development footprint as No go areas.</p> <ul style="list-style-type: none"> • Ensure all alien invasive vegetation are removed. 				
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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
<ul style="list-style-type: none"> - No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; - The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; - 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; - Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; - 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; - No deliberate or intentional killing of fauna is allowed; - In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and - 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. 	CEO / CEO	<ul style="list-style-type: none"> • Undertake regular ECO audits / inspections to report on compliance with the EMP requirements. • Restrict construction activities to the immediate development footprint. • Apply a no poaching policy on site. • Ensure that Permits for the relocation of animals are obtained, if required. • Include avifauna impacts of off-road driving in the construction staff environmental awareness training. 	Throughout construction	ECO	Monthly	<ul style="list-style-type: none"> • Check Percentage compliance with EMP requirements in ECO Reports. • Check Permits on file. • Check size of area disturbed outside of construction site boundary. • Check environmental awareness training documentation.

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; - Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; - 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. 	dEO / cEO	<ul style="list-style-type: none"> • Implement a chance find procedure for palaeontology and heritage finds. • Put aside and photograph any fossils found during excavations and send pictures to a palaeontologist to assess their scientific importance. • If deemed important, the palaeontologist must obtain a SAHRA permit and remove stromatolites to a recognised repository. 	Throughout constructions.	ECO	Monthly	<ul style="list-style-type: none"> • Review chance finds procedure and check evidence of compliance. • Check photographic record on file • Check evidence of correspondence with palaeontologist on file.

5.13 Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.						
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 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.; - All unattended open excavations must be adequately fenced or demarcated; - Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; - Ensure structures vulnerable to high winds are secured; - Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged. 	dEO / cEO	<ul style="list-style-type: none"> • Notify local authority of potential fire threats. • Document incident and complaints. 	Throughout construction and maintenance	ECO	Monthly	<ul style="list-style-type: none"> • Check local authority notification. • Check open excavation are fenced or demarcated. • Check that structures are secured. • Check complaints register.

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
<ul style="list-style-type: none"> - Mobile chemical toilets are installed onsite if no other ablution facilities are available; - 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; - Where mobile chemical toilets are required, the following 	Contractor, cEO	<ul style="list-style-type: none"> • Secure toilets to the ground. • Maintain toilets in a hygienic state. 	Throughout construction	ECO	Monthly	<ul style="list-style-type: none"> • Check ablution facilities more than 100m from any watercourse. • Check that Portable toilets are secured. • Check for evidence

<p>must be ensured:</p> <p>a) Toilets are located no closer than 100 m to any watercourse or water body;</p> <p>b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;</p> <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>Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;</p> <p>f) A copy of the waste disposal certificates must be maintained.</p>						<p>of portable toilet chemical spills.</p> <ul style="list-style-type: none"> • Check for external closing mechanism. • Check toilet servicing receipt.
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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
<ul style="list-style-type: none"> - Undertake environmentally-friendly pest control in the camp area; - Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; - The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; - Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; - Free condoms must be made available to all staff on site at central points; - Medical support must be made available; - Provide access to Voluntary HIV Testing and Counselling Services. 	dEO / CEO	As defined and stipulated in a Method Statement	Throughout construction.	ECO	Monthly	<ul style="list-style-type: none"> • Check for records of pest control in the camp. • Check that information posters on AIDS are displayed at the Contractors Camp. • Check that medical support is available if required.

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
<ul style="list-style-type: none"> - Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; - The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; - All staff must be made aware of emergency procedures as part of environmental awareness training; 	dEO / CEO	<ul style="list-style-type: none"> • Compile ERAP. • Inform staff of the ERAP. • Inform local authorities immediately in 	<ul style="list-style-type: none"> • Prior to construction • Throughout construction 	ECO	Monthly	<ul style="list-style-type: none"> • Check ERAP is on file. • Check content of ERAP. • Check content of environmental

<ul style="list-style-type: none"> - The relevant local authority must be made aware of a fire as soon as it starts; - In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see Hazardous Substances section 5.17). 		<p>the event of a fire.</p>				<p>awareness training documentation.</p>
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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
<ul style="list-style-type: none"> - The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; - All hazardous substances must be stored in suitable containers as defined in the Method Statement; - Containers must be clearly marked to indicate contents, quantities and safety requirements; - All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; - Bunded areas to be suitably lined with a SABS approved liner; - An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; - All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); - All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; - Employees handling hazardous substances / materials must 	<p>dEO / CEO</p>	<ul style="list-style-type: none"> • As per approved Method Statement. 	<p>Throughout construction and maintenance</p>	<p>ECO</p>	<p>Monthly</p>	<ul style="list-style-type: none"> • Check procedures for storage of potential pollutants and hazardous substances. • Check hazardous material storage facilities. • Check the HCS control sheet. • Check MSDS are on file. • Check that staff are using PPE. • Check refuelling areas are established. • Check use of drip trays on site. • Check material stores are secured. • Check fire fighting equipment is

<p>be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available;</p> <ul style="list-style-type: none"> - The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; - The tanks/ bowsers 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/ bowsers (110% statutory requirement plus an allowance for rainfall); - The floor of the bund must be sloped, draining to an oil separator; - Provision must be made for refueling 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; - All empty externally dirty drums must be stored on a drip tray or within a bunded area; - No unauthorised access into the hazardous substances storage areas must be permitted; - No smoking must be allowed within the vicinity of the hazardous storage areas; - Adequate fire-fighting equipment must be made available at all hazardous storage areas; - Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; <p>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;</p> <ul style="list-style-type: none"> - The responsible operator must have the required training to make use of the spill kit in emergency situations; 							<p>available and serviced.</p> <ul style="list-style-type: none"> • Check forevidence of spills. • Check spill kit is present on site.
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<ul style="list-style-type: none"> - An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; - 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. 					
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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
<ul style="list-style-type: none"> - Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; - 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; - Leaking equipment must be repaired immediately or be removed from site to facilitate repair; - Workshop areas must be monitored for oil and fuel spills; - Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; - 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; - Water drainage from the workshop must be contained and managed in accordance Section 5.7: storm and waste water management. 	dEO / CEO	<ul style="list-style-type: none"> • Ensure drip trays are used during maintenance and repairs. • Notify local authorities in the event of a fire. • Ensure water drained from the workshop is contained. 	Throughout construction and maintenance	ECO	Monthly	<ul style="list-style-type: none"> • Check repairs take place in the workshop area. • Check drip trays are used during maintenance and repairs. • Check for evidence of leaks. • Check inspection / maintenance records.

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
<ul style="list-style-type: none"> - Concrete mixing must be carried out on an impermeable surface; - Batching plants areas must be fitted with a containment facility for the collection of cement laden water. - Dirty water from the batching plant must be contained to prevent soil and groundwater contamination - Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; - A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; - Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; - Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; - Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions) - Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; - Temporary fencing must be erected around batching plants in accordance with Section 5.5: Fencing and gate installation. 	<p>Contractor, cEO</p>	<ul style="list-style-type: none"> • Batch cement in a bunded area within the boundaries of the development footprint only. • Ensure that cement is mixed on mortar boards and not directly on the ground (where unavoidable). • Design and construct a containment facility for cement washwater. • Store cement at least 10m Away from watercourses, gullies and drains. • Fence the batching plants. 	<p>Throughout construction and maintenance</p>	<p>ECO</p>	<p>Monthly</p>	<ul style="list-style-type: none"> • Check for evidence of batching activities on exposed soil. • Check cement wash water containment facility. • Check bins are provided. • Check for dust emanating from the batching area. • Check excess sand, stone and cement is removed or reused on site. • Check batching plants are fenced.

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
<ul style="list-style-type: none"> - Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; - 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; - Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible 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; - Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; - Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; - Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; - Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all completed earthworks; - For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread 	cECO	<ul style="list-style-type: none"> • Regularly evaluate the effectiveness of all dust management measures. Amend how or which measures are used if necessary. • As per approved Method Statement. 	Throughout construction.	ECO	Monthly	<ul style="list-style-type: none"> • Check for dust coming off construction site. • Check dust mitigation measures in place. • Check number of dust complaints.

of dust.						
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5.21 Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
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"> Any blasting activity must be conducted by a suitably licensed blasting contractor; and Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site. 	dEO / cEO	<ul style="list-style-type: none"> Appoint suitably licensed blasting contractor. Notify surrounding landowners, emergency services and site personnel of blasting. 	<ul style="list-style-type: none"> Throughout construction. Notify at least 24 hours prior to blasting. 	ECO	Monthly	<ul style="list-style-type: none"> Check appointed contractor is appropriately licenced. Check notification of blasting.

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
<ul style="list-style-type: none"> The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or 	dEO / cEO	<ul style="list-style-type: none"> Investigate potential noise reduction measures, such as mufflers on equipment, if complaints regarding construction noise 	Throughout construction and maintenance	ECO	Monthly	<ul style="list-style-type: none"> Check number of noise complaints.

<p>applicable, provide transport to and from the site on a daily basis for construction workers;</p> <ul style="list-style-type: none"> – 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. 		<p>are received.</p> <ul style="list-style-type: none"> • Limit noisy construction activities to day-time from Monday to Friday or in accordance with relevant municipal bylaws, if applicable. 				
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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
<ul style="list-style-type: none"> – Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two way swop of contact details between ECO and FPA. 	dEO / cEO	<ul style="list-style-type: none"> • Designate smoking areas. • Procure firefighting equipment. • Liaise with the FPA where required. 	Throughout construction and maintenance.	ECO	Monthly	<ul style="list-style-type: none"> • Check designated smoking area. • Check firefighting equipment is available.

5.24 Stockpiling and stockpile areas

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.						
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 material that is excavated during the project development phase (either during piling (if required) or earthworks) must be 	dEO / cEO	<ul style="list-style-type: none"> • As defined and stipulated in a 	Throughout construction	ECO	Monthly	<ul style="list-style-type: none"> • Visually inspect for incidence of erosion.

<p>stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;</p> <ul style="list-style-type: none"> – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; – Topsoil stockpiles must not exceed 2 m in height; – During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); – Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material. 		<p>Method Statement.</p> <ul style="list-style-type: none"> • Locate topsoil stockpiles in an area protected from the wind, and agreed to with the ECO. • Ensure suitable control of run-off during the construction phase to prevent erosion of topsoil on adjacent land and undeveloped portions of the site.. 	<p>and maintenance.</p>			
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5.25 Civil works

<p>Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.</p>						
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"> – 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; – Areas to be rehabilitated include terrace embankments 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; – 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 	<p>dEO / cEO</p>	<ul style="list-style-type: none"> • Stockpile topsoil for rehabilitation. • Ensure erosion control is implemented on site. • Replace harvested topsoil in areas that are to be rehabilitated as soon as sections of the works are completed (i.e. not only following the 	<p>Throughout construction.</p>	<p>ECO</p>	<p>Monthly</p>	<ul style="list-style-type: none"> • Check for incidence of incorrect storage and harvesting of topsoil. • Visually inspect for incidence of erosion.

<p>adhered to and implemented strictly;</p> <ul style="list-style-type: none"> - Rehabilitation of the disturbed areas must be managed in accordance with Section 5.35: Landscaping and rehabilitation; - All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and - Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes. 		<p>completion of all works).</p>				
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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
<ul style="list-style-type: none"> - 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; - Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; - Management of equipment for excavation purposes must be undertaken in accordance with Section 5.18: Workshop, equipment maintenance and storage; and - Hazardous substances spills from equipment must be managed in accordance with Section 5.17: Hazardous substances. 	<p>dEO / cEO</p>	<ul style="list-style-type: none"> • Dispose of excess spoil at a licensed landfill site, if not used for backfilling. 	<p>Throughout construction</p>	<p>ECO</p>	<p>Monthly</p>	<ul style="list-style-type: none"> • Check use of spoil on site.

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
<ul style="list-style-type: none"> – Batching of cement to be undertaken in accordance with Section 5.19: Batching plants; and – Residual solid waste must be disposed of in accordance with Section 5.8: Solid waste and hazardous management. 	dEO / cEO	<ul style="list-style-type: none"> • As per section 5.19 and section 5.8. 	Throughout construction	ECO	Monthly	• As per section 5.19 and 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
<ul style="list-style-type: none"> – Management of dust must be conducted in accordance with Section 5.20: Dust emissions; – Management of equipment used for installation must be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage; – Management hazardous substances and any associated spills must be conducted in accordance with Section 5.17: Hazardous substances; and – Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management. 	dEO / cEO	<ul style="list-style-type: none"> • As per section 5.20, 5.18, 5.17 and 5.8 	Throughout construction	ECO	Monthly	• As per section 5.20, 5.18, 5.17 and 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
<ul style="list-style-type: none"> - During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts - 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. 	dEO / cEO	<ul style="list-style-type: none"> • As defined and stipulated in a Method Statement. • As per section 5.18. 	Throughout construction.	ECO	Monthly	<ul style="list-style-type: none"> • Check that wasted or unused material is collected and removed from site. • As per section 5.18.

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
<ul style="list-style-type: none"> - Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with Section 6.8: Solid waste and hazardous Management; - Management of equipment used for installation shall be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage; - Management hazardous substances and any associated spills shall be conducted in accordance with Section 5.17: Hazardous substances. 	dEO / cEO	<ul style="list-style-type: none"> • As defined and stipulated in a Method Statement. • As per section 6.8, 5.18 and 5.17 	Throughout construction	ECO	Monthly	<ul style="list-style-type: none"> • Check waste disposal receipts. • Check for litter on site. • Evidence of hazardous waste spills. • As per section 6.8, 5.18 and 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
<ul style="list-style-type: none"> Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management. 	dEO / cEO	<ul style="list-style-type: none"> As defined and stipulated in a Method Statement. As per section 5.8 	Throughout construction	ECO	Monthly	<ul style="list-style-type: none"> Waste disposal receipts. Check for litter on site. As per 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
<ul style="list-style-type: none"> Develop and implement communication strategies to facilitate public participation; Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; Sustain continuous communication and liaison with neighboring owners and residents Create work and training opportunities for local stakeholders; and Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers. 	dEO / cEO	<ul style="list-style-type: none"> Develop and implement communication strategies. Develop approach to conflict resolution. Communicate with neighbouring landowners and residents. Create job opportunities for local workers. 	Throughout construction and maintenance.	ECO	Monthly	<ul style="list-style-type: none"> Check methods developed for communication. Check communication with neighbouring landowners and residents. Check that no workers are staying overnight on the site.

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
<ul style="list-style-type: none"> - Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in sections 5.17: management of hazardous substances and 5.18 workshop, equipment maintenance and storage; - Hazardous storage areas must be well ventilated; - Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; - Emergency and contact details displayed must be displayed; - Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; - Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; - Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; - Structures vulnerable to high winds must be secured; - Wind and dust mitigation must be implemented; - Cement and materials stores must have been secured; - Toilets must have been emptied and secured; - Refuse bins must have been emptied and secured; - Drip trays must have been emptied and secured. 	<p>dEO / cEO</p>	<ul style="list-style-type: none"> • As defined and stipulated in a Method Statement. • As per section 5.17 and 5.18 • Store hazardous substances in well-ventilated area. • Ensure that bunds and drip trays are emptied and effluent appropriately disposed of. • Ensure fire extinguishers are accessible and serviced. • Display emergency contact details. • Secure any structures vulnerable to high winds. • Erosion control must be implemented. • Toilets and bins must be emptied. 	<p>Throughout construction.</p>	<p>ECO</p>	<p>Monthly</p>	<ul style="list-style-type: none"> • As per section 5.17 and 5.18 • Check that bunds and drip trays are emptied of effluent. • Check that hazardous substances are stored in a well ventilated area. • Check that firefighting equipment is serviced and accessible. • Check that communication to local authorities are filed, if necessary. • Check that structures vulnerable to high winds are secured. • Check that erosion control measures are implemented. • Check toilet servicing slips. • Check that bins have been

emptied.

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
<ul style="list-style-type: none"> – All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; – Oil containing equipment must be stored to prevent leaking or be stored on drip trays; – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; – 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; – The Contractor must also be equipped to contain and clean up any pollution causing spills; and – Disposal of unusable material must be at a licensed waste disposal site. 	CEO / CEO	<ul style="list-style-type: none"> • Plant should be placed on drip trays. • Materials should be stored neatly on site. • Remove all equipment or material that may cause pollution. • Ensure that there is a spill kit present on site. 	Throughout construction	CEO	Monthly	<ul style="list-style-type: none"> • Check for evidence of spills or leaks. • Check that materials are stored neatly on site. • Check waste disposal receipts.

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
<ul style="list-style-type: none"> – All areas disturbed by construction activities must be subject 	CEO, CEO	• As defined and	Throughout	CEO	Monthly	• Check that

<p>to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site;</p> <ul style="list-style-type: none"> - 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 - 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; - 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; - 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; - Rehabilitation of access roads outside of farmland; - Indigenous species must be used for with species and grasses to where it compliments or approximates the original condition; - Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: Stockpiling and stockpiled areas); - Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; - Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; - Subsoil must be ripped before topsoil is placed; - The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; - Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; - 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; 		<p>stipulated in a Method Statement.</p> <ul style="list-style-type: none"> • Ensure that slopes are assessed for contouring and terracing. • Ensure that access roads are rehabilitated. • Rehabilitate with indigenous species. • Ensure that top soil is used for rehabilitation rather than backfilling. 	<p>construction.</p>		<p>areas disturbed as a result of construction have been rehabilitated.</p> <ul style="list-style-type: none"> • Check that access roads have been rehabilitated. • Check that indigenous species are used for rehabilitation purposes. • Check that topsoil is used for rehabilitation. • Check that all sloped areas have appropriate erosion control (i.e. there is no evidence of erosion).
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<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. - 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"> • Annual and perennial plants are chosen; • Pioneer species are included; • Species chosen must be indigenous to the area with theseeds used coming from the area; • Root systems must have a binding effect on the soil; - The final product must not cause an ecological imbalance in the area 						
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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:

Name of applicant: **South Africa Mainstream Renewable Power Developments (Pty) Ltd**

Contact Person: **Gesie Theron**

Tel No: **021 657 4052 / 073 871 5781**

Fax No: **021 671 5665**

Postal Address: **PO Box 45063, Claremont, 7735**

Physical Address: **4th Floor Mariendahl House, Newlands on Main, Corner Main Road and Campground, Claremont, Cape Town**

7.1.2 Details and expertise of the EAP:

Name of EAP: **Kelly Armstrong**

Tel No: **021 659 3060**

Fax No: **086 530 7003**

E-mail address: karmstrong@srk.co.za

Expertise of the EAP (Curriculum Vitae [CVs] included):

**Kelly Armstrong: BSocSci (Hons) Environmental Science.
CV included in Appendix 2**

7.1.3 Project name:

Swallow on site substation

7.1.4 Description of the project:

Background

South Africa Mainstream Renewable Power Developments (Pty) Ltd (Mainstream) intends to construct up to nine PV facilities and associated infrastructure (including grid connections, Battery Energy Storage Systems (BESS) and ancillary infrastructure), referred to as the Stilfontein PV Cluster (see Figure 2). The Stilfontein Cluster is located ~20 km south-west of Potchefstroom and ~6 km north-east of Stilfontein, in the Dr Kenneth Kaunda District Municipality in North West Province and within the Klerksdorp Renewable Energy Development Zone (REDZ) and the Central Strategic Transmission Corridor (STC).

The Stilfontein Cluster comprises nine proposed PV facilities, each with a notional development area (footprint) of ~220 to 405 ha: Spoonbill (Project 1), Sunbird (Project 2), **Swallow (Project 3)**, Snipe (Project 4), Shrike (Project 5), Stilfontein (Project 6), Sparrow (Project 7), Starling (Project 8) and Swift (Project 9).

individual PV projects in the Stilfontein Cluster as well as the associated grid connections, as follows (see Figure 2):

- 9 x PV facilities, including 11-33 kV transmission lines, each including Battery Energy Storage Systems (BESS), and 9 x Independent Power Producer (IPP)-side on-site substations;
- 9 x Eskom-side on-site substations and 132 kV transmission lines to the Main Transmission Station (MTS); and
- 1 x MTS and 400 kV lines to existing Hermes Pluto transmission lines.

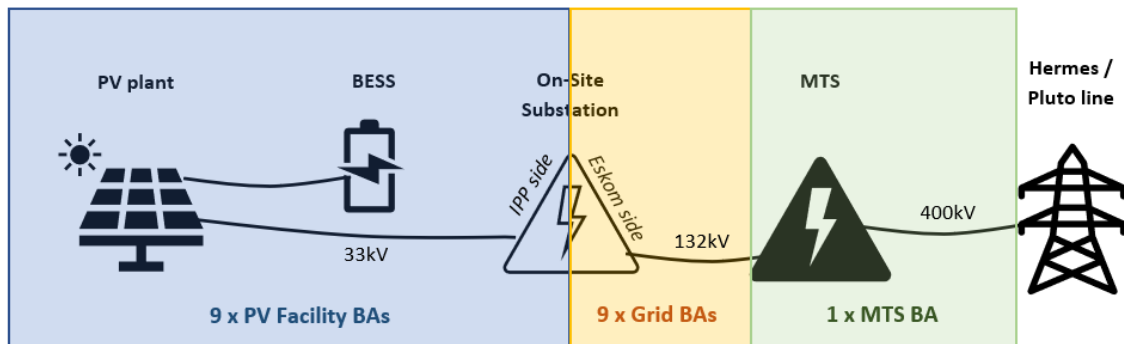
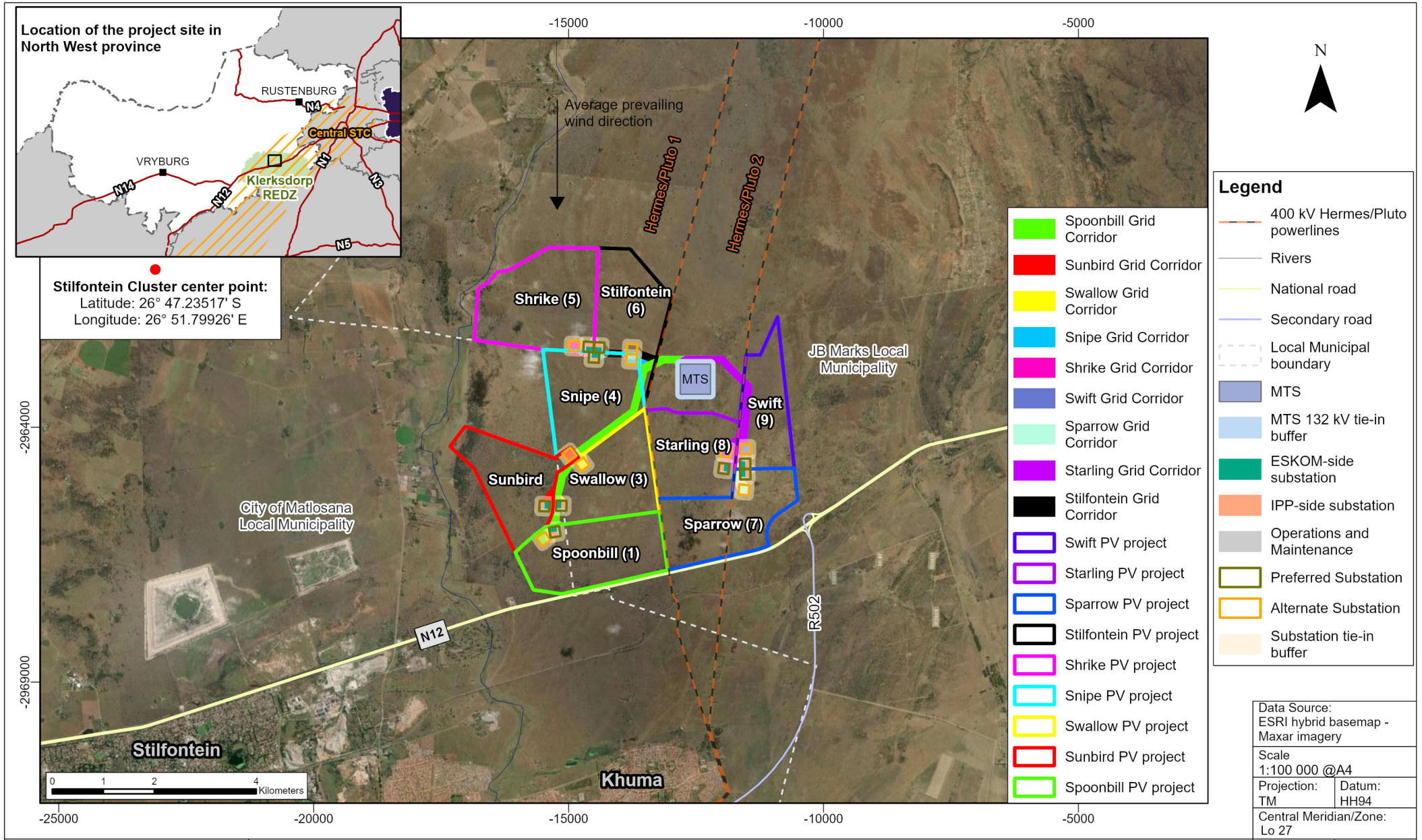
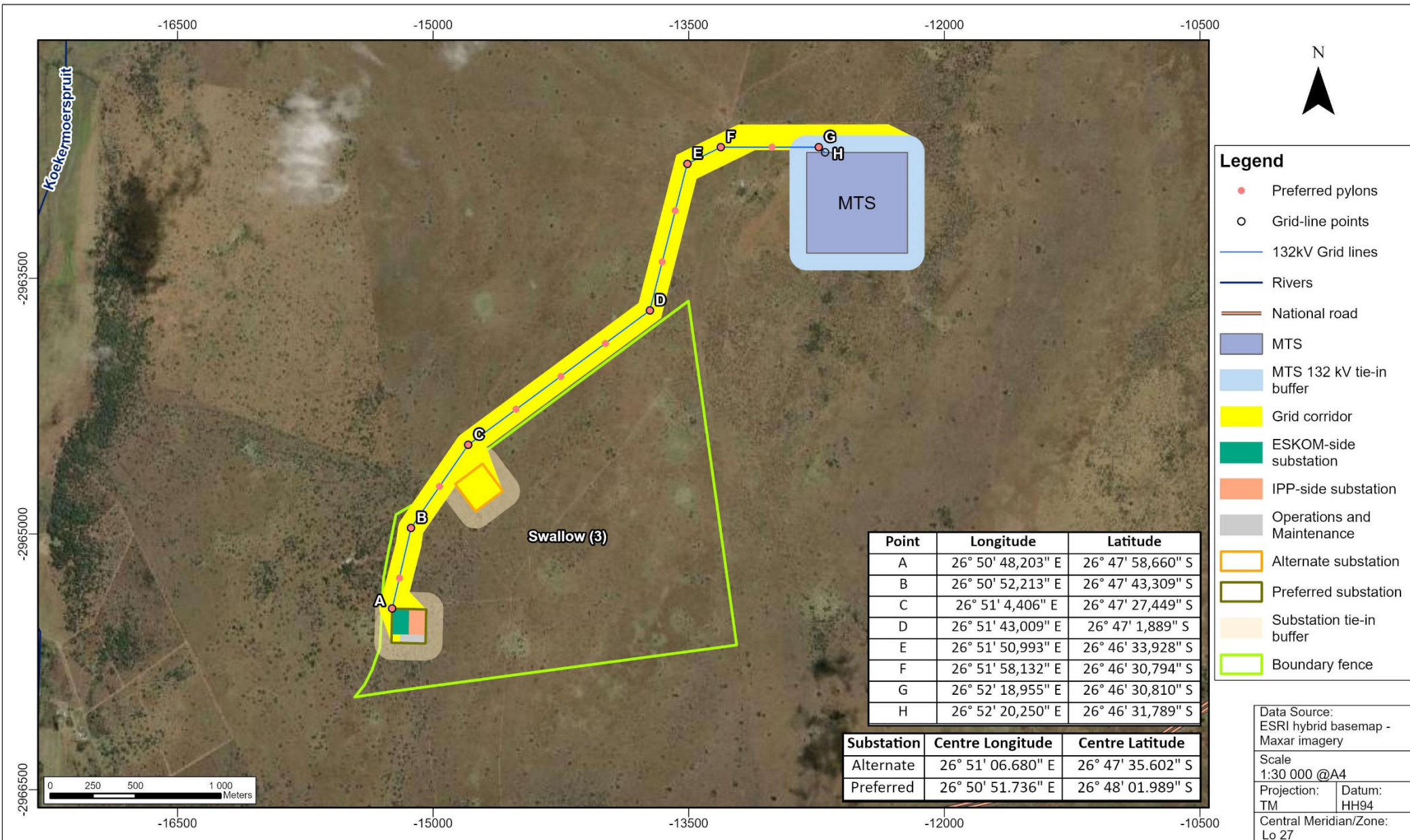


Figure 1: Components included in individual BA processes for the Stilfontein Cluster

This Generic EMPr is required to be implemented during the construction of the Swallow on-site substation (see Figure 3), which comprises of the Independent Power Producer (IPP) side and Eskom-side of the on-site substation (and will therefore be included as an EMPr in the 9 PV Facility BAs and 9 Grid BAs specific to the on-site substation only).





Legend

- Preferred pylons
- Grid-line points
- 132kV Grid lines
- Rivers
- National road
- MTS
- MTS 132 kV tie-in buffer
- Grid corridor
- ESKOM-side substation
- IPP-side substation
- Operations and Maintenance
- Alternate substation
- Preferred substation
- Substation tie-in buffer
- Boundary fence

Point	Longitude	Latitude
A	26° 50' 48,203" E	26° 47' 58,660" S
B	26° 50' 52,213" E	26° 47' 43,309" S
C	26° 51' 4,406" E	26° 47' 27,449" S
D	26° 51' 43,009" E	26° 47' 1,889" S
E	26° 51' 50,993" E	26° 46' 33,928" S
F	26° 51' 58,132" E	26° 46' 30,794" S
G	26° 52' 18,955" E	26° 46' 30,810" S
H	26° 52' 20,250" E	26° 46' 31,789" S

Substation	Centre Longitude	Centre Latitude
Alternate	26° 51' 06.680" E	26° 47' 35.602" S
Preferred	26° 50' 51.736" E	26° 48' 01.989" S

Data Source: ESRI hybrid basemap - Maxar imagery	
Scale 1:30 000 @A4	
Projection: TM	Datum: HH94
Central Meridian/Zone: Lo 27	
Date: 05/10/2023	Compiled by: MAHH
Project No. 581877	Fig No. 3



STILFONTEIN PV CLUSTER BAs - GRID INFRASTRUCTURE
SWALLOW PV PROJECT SITE

Description of IPP-Side of On-Site Substation

A substation is a part of an electrical generation, transmission and distribution system. Substations transform voltage from low to high, or the reverse, or perform any of several other important functions. Between the generating station and consumer, electric power may flow through several substations to deliver electricity at the required voltage. A substation typically includes transformers to change voltage levels from low distribution voltages to high transmission voltages and, and/or is constructed at the interconnection of two different transmission voltages.

The IPP-side of the on-site substation will receive incoming power from the Swallow PV facility at 11 - 33 kV and step up outgoing (Eskom-side) electricity to the Main Transmission Substation at 132 kV. The IPP-side of the substation will be owned and operated by the IPP and is therefore included in the Swallow PV facility application.

The IPP-side of the on-site substation comprises an inverter (step up facility) to convert power from DC to AC and step up the voltage from 11 - 33 kV to 132 kV. The proposed on-site substation will have a development footprint of up to 2 ha (110 m X 200 m) within the nominal 4 ha substation area (200 m x 200 m) assessed in the BA.

The technically preferred alternative for the IPP side of the on-site substation is shown in Figure 3.

Description of Eskom-Side of On-Site Substation

The Eskom-side of the on-site substation includes the 132 kV portion of the substation and associated equipment, infrastructure and buildings.

The proposed Eskom-side substation will have a development footprint of up to 2 ha (100 m x 200 m) within the nominal 4 ha substation area (200 m x 200 m) assessed in the BA.

The technically preferred alternative for the Eskom-side of the on-site substation is shown in dark green in Figure 3.

7.1.5 Project location:

The Swallow facility and associated on-site substation is located in the City of Matlosana and JB Marks Local Municipality within the Dr Kenneth Kaunda District Municipality in North West Province, South Africa. The project site is located approximately 6 km east of the town of Stilfontein along the N12 and forms part of the proposed, larger Stilfontein PV Cluster (Figure 2).

Table 1: Property details of Swallow on-site substation

Property name, number and portion	Centre Point Co-ordinates of Preferred On-Site Substation	Centre Point Co-ordinates of Alternative On-Site Substation
Stilfontein RE26/408 and Witstinkhoutbaken 1/409 (preferred) Doornplaat RE4/410 (alternative)	26° 50' 51.736"E 26° 48' 01.989"S	26° 51' 06.680"E 26° 47' 35.602"S

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.



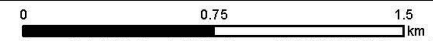
Swallow Agriculture Combined Sensitivity



29 September 2023

Legend

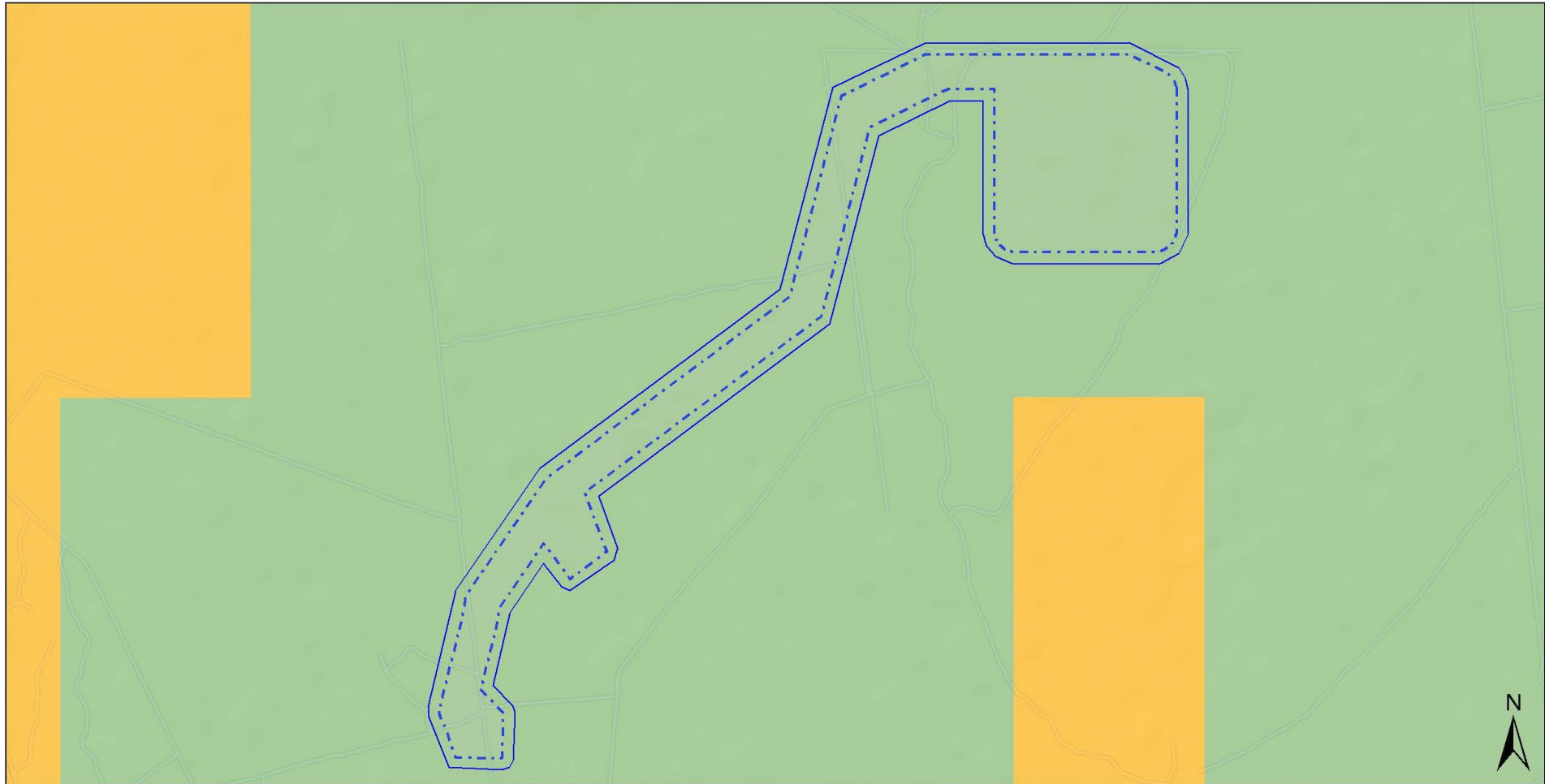
- Buffer
- Site Area
- Agriculture Combined Sensitivity
 - Very High
 - High
- Medium
- Low



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Animal Species Combined Sensitivity



29 September 2023

Legend

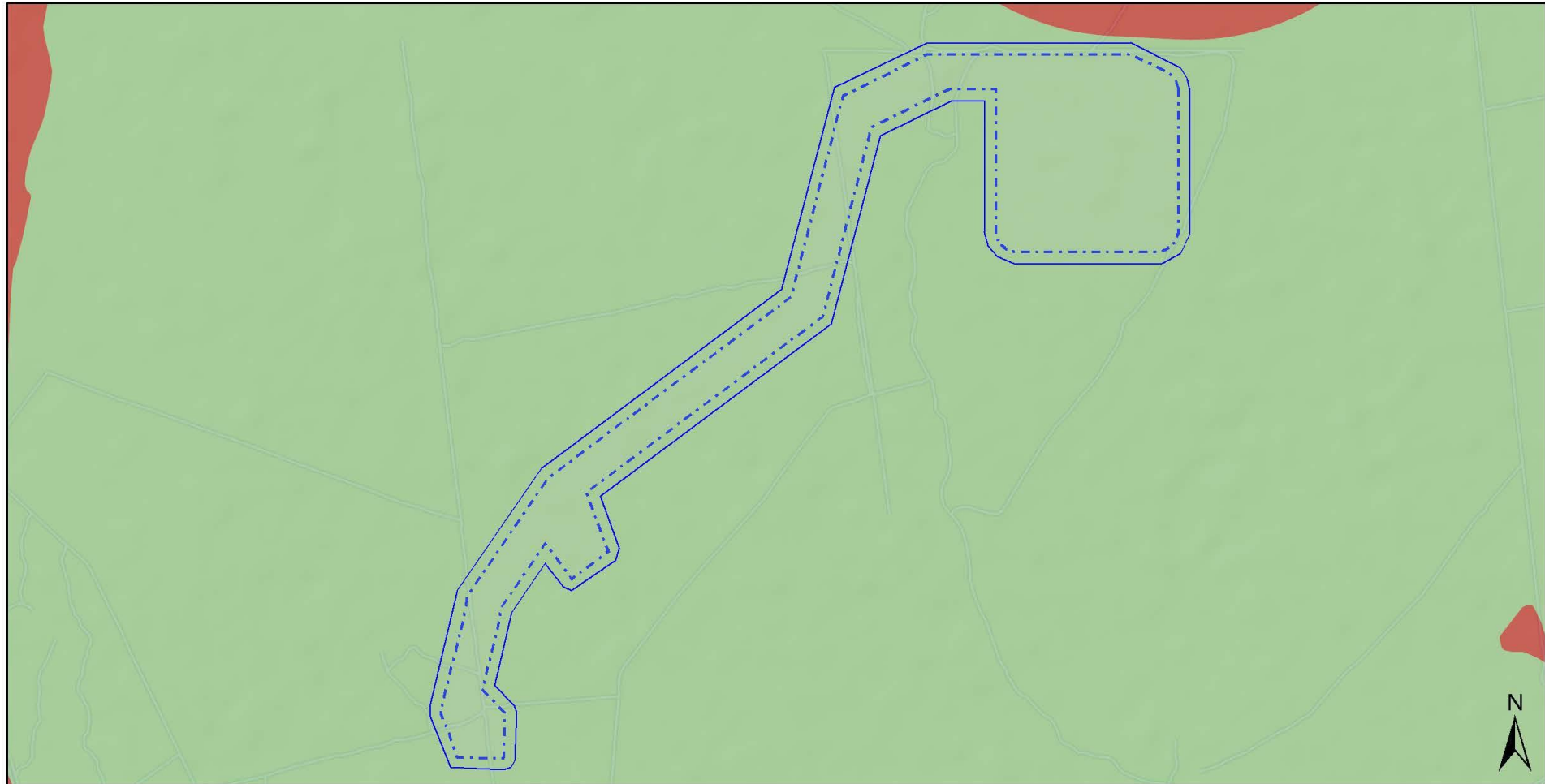
- Buffer
- Site Area
- Animal Species Combined Sensitivity
 - Very High
 - High
- Medium
- Low

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Aquatic Biodiversity Combined Sensitivity



29 September 2023

Legend

- Buffer
- Site Area
- Aquatic Biodiversity Combined Sensitivity**
 - Very High
 - Low

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Archeology and Cultural Heritage Combined Sensitivity



29 September 2023

Legend

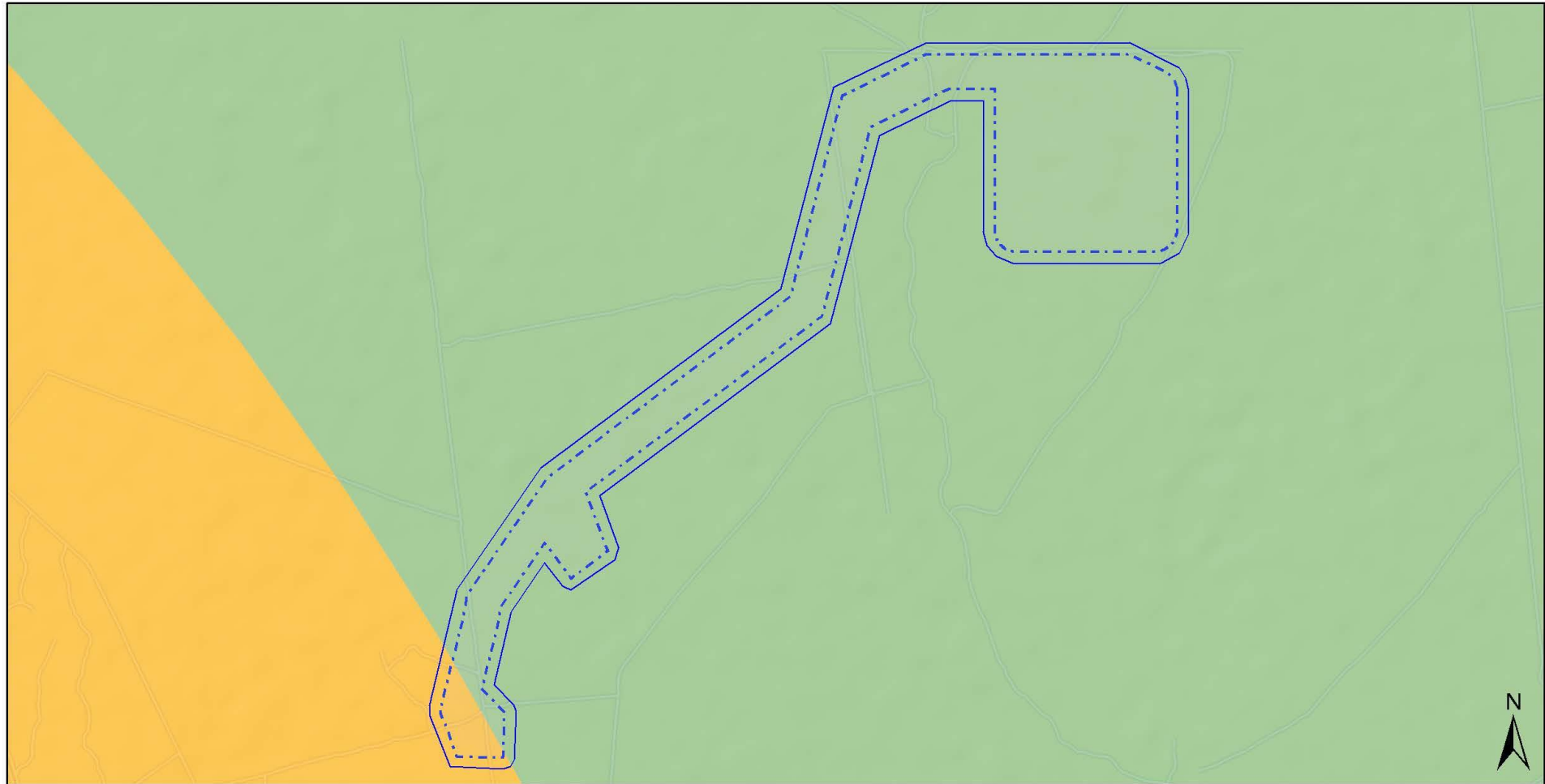
- Buffer
- Site Area
- Archaeological and Cultural Heritage Combined Sensitivity
 - Very High
 - High
 - Low

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Civil Aviation Combined Sensitivity



29 September 2023

Legend

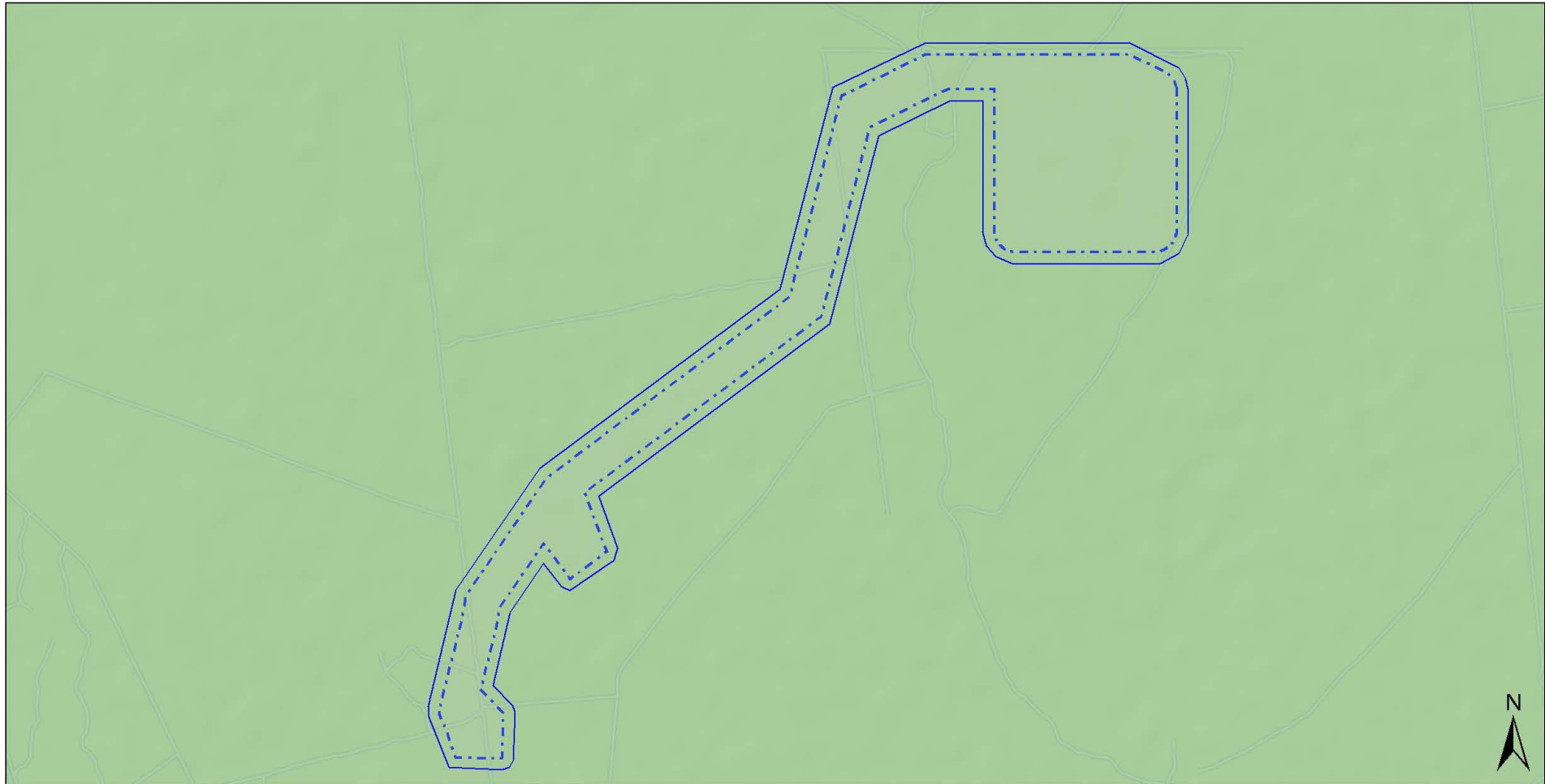
- Buffer
- Site Area
- Civil Aviation Combined Sensitivity
 - Very High
 - High
- Medium
- Low

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Defence Combined Sensitivity



29 September 2023

Legend

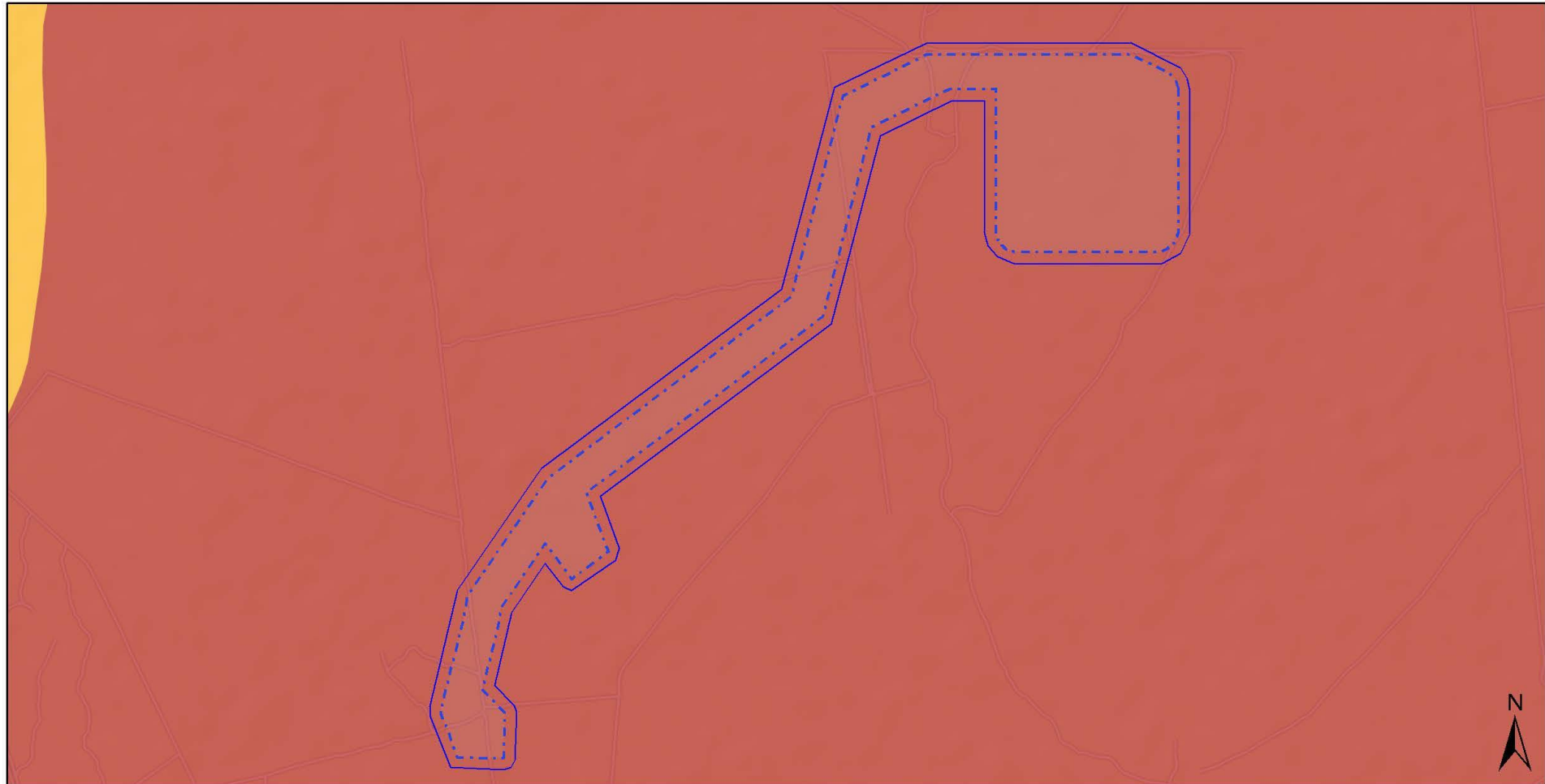
- Buffer
- Site Area
- Defence Combined Sensitivity
 - Very High
 - High
 - Medium
 - Low

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Paleontology Combined Sensitivity



29 September 2023

Legend

- Buffer Medium
- Site Area Low
- Paleontology Combined Sensitivity**
- Very High
- High

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Plant Species Combined Sensitivity



29 September 2023

Legend

- Buffer
- Site Area
- Plant Species Combined Sensitivity
 - Very High
 - High
 - Medium
 - Low

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



Swallow Terrestrial Biodiversity Combined Sensitivity



29 September 2023

Legend

- Buffer
- Site Area
- Terrestrial Biodiversity Combined Sensitivity**
 - Very High
 - Low

0 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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 of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA

Date:

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 Visual aspects

Impact management outcome: No or very limited visual clutter from construction activities and visual intrusion from operation activities to local communities

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"> - Minimise the on-site substation footprint, if possible. - Ensure that any built structures within the on-site substation footprint blend into the landscape. - Do not install or affix lights on pylons. - Reduce the height of lighting masts to a workable minimum. - Direct lighting inwards and downwards to limit light pollution. - Limit vegetation clearance and the footprint of construction to what is absolutely essential. - Consolidate the footprint of the construction camp to a functional minimum. - Avoid excavation, handling and transport of materials which may generate dust under very windy conditions. - Cover stockpiled aggregates and sand to minimise dust generation. - Implement dust suppression on access roads during dry conditions. - Keep construction site tidy. - Retain or re-establish natural vegetation around the on-site substation as far as practically possible. 	dEO / cEO	<ul style="list-style-type: none"> • As per impact management action 	<ul style="list-style-type: none"> • Design, construction and operation phases 	ECO	Monthly	<ul style="list-style-type: none"> • Check final design includes EMPr requirements • Check site camp located strategically to limit vegetation clearance • Check no. of complaints • Check compliance with EMPr dust management measures • Check the site is neat and tidy. • Check size of area cleared relative to development footprint.

8.2 Avifauna displacement

Impact management outcome: No unnecessary displacement of avifauna due to disturbance and habitat transformation

Impact Management Actions	Implementation	Monitoring
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	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> - Undertake regular ECO audits / inspections to report on compliance with the EMPr (including compliance with noise control mechanisms). - Restrict construction activities to the immediate development footprint. - Utilise existing access roads and keep the construction of new roads to a minimum. - Implement best practice measures to control noise and dust. - Demarcate access roads clearly. - Prohibit off-road driving. - Include avifauna impacts of off-road driving in the construction staff environmental awareness training. - Appoint a rehabilitation specialist to develop and implement a Habitat Rehabilitation Plan. - Conduct site inspections to monitor the progress of rehabilitation, as and when required based on specialist recommendations according to the Habitat Rehabilitation Plan. - <u>Retain or relocate existing waterpoints to ensure at least four waterpoints are retained within the Stilfontein Project Cluster, one of which must be in the north west and one in the south east of the Cluster.</u> - Implement (strictly) the mitigation measures made in the terrestrial ecology specialist assessment. 	dEO / cEO	<ul style="list-style-type: none"> • As per impact management actions 	<ul style="list-style-type: none"> • Throughout construction 	ECO	Monthly	<ul style="list-style-type: none"> • Percentage compliance with EMPr requirements • Size of area disturbed outside of construction site boundary • No. of noise and dust complaints • Access roads demarcated • Design plans indicate buffer • Evidence of disturbance outside of construction footprint • Compliance with the Habitat Rehabilitation Plan • No. of plants relocated • Alignment with Habitat Rehabilitation Plan • Plant cover • <u>Water points retained as per mitigation requirement</u> • Compliance with the Habitat Rehabilitation Plan • Compliance with EMPr

8.3 Avifauna mortality

Impact management outcome: No or very little mortality of avifauna due to electrocution						
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"> Investigate electrocution incidents and implement appropriate mitigation by insulating any hardware that causes repeat electrocutions. 	dEO / cEO	<ul style="list-style-type: none"> Visual inspection and investigation 	<ul style="list-style-type: none"> Throughout operations 	ECO	Monthly	<ul style="list-style-type: none"> Check bird mortality register on file Check number of recorded bird mortalities

8.4 Land based fauna displacement

Impact management outcome: No unnecessary disturbance to fauna						
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"> Design outside lighting to limit impacts on fauna. Fit lighting fixtures with baffles, hoods or louvres and directed light downward. Direct outside lighting away from sensitive areas such as the wetland. Avoid fluorescent and mercury vapor lighting. Utilise sodium vapor (yellow) lights wherever possible. Utilise motion detection lighting wherever possible to minimise the unnecessary illumination of areas. Minimise traffic and the use of vehicle lights during the night. Minimise noise from dusk to dawn to minimize disturbances to amphibian species and nocturnal mammals. Obtain permits for the relocation of animals as and if 	dEO / cEO	<ul style="list-style-type: none"> Include lighting requirements in design plan As per impact management action 	<ul style="list-style-type: none"> During design, construction and operation phase 	ECO	Monthly	<ul style="list-style-type: none"> Check final design compliant with EMPr requirements Check complaints register No. of noise and traffic and visual complaints Prevalence of amphibian species and nocturnal

required.							mammals in the area
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8.5 Habitat loss / fragmentation

Impact management outcome: No unnecessary degradation and loss of habitat and protected species

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"> - Demarcate the construction footprint with visible barriers (i.e. safety tape / fencing/ signage). - Restrict vegetation clearance to the immediate development footprint. - Clear vegetation by hand cutting to avoid heavy machinery, as far as practically possible. - Utilise existing access routes and paths, where possible. - Limit construction of new roads as much as possible. - Avoid disturbance to rocky habitats. - Minimise the number (and size) of laydown, storage and staff facilities. - Remove all remaining construction materials once the construction phase ends. - Store topsoil stockpiles on flat ground and use bunds and/or other stabilisation methods (e.g., netting) to avoid erosion. - Obtain relocation or destruction permits before any protected trees (<i>Vachellia erioloba</i>) are relocated or destroyed. - Compile and implement a hydrocarbon spill management plan; - Compile and implement a Fire Management Plan. - Compile and implement an Alien Vegetation Management Plan. - Appoint a rehabilitation specialist to develop and 	<p>dEO / cEO</p>	<ul style="list-style-type: none"> • As per impact management action. 	<ul style="list-style-type: none"> • During design and construction phases 	<p>ECO</p>	<p>Monthly</p>	<ul style="list-style-type: none"> • Check final design compliant with EMPr requirements • Check barriers in place • Check evidence of disturbance outside of project footprint • Permits on file • No. of hydrocarbon spill incidents • Safe disposal certificates on file

<p>implement a Habitat Rehabilitation Plan.</p> <ul style="list-style-type: none">- Rehabilitate areas as soon as they are no longer impacted by construction.- Utilise indigenous vegetation only for habitat rehabilitation.- Return topsoil as soon as possible.						
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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: CVs

Kelly Armstrong

Environmental Consultant



Profession	Environmental Consultant
Education	BSocSc Hons (Environmental & Geographical Studies), University of Cape Town, 2017
Registrations/ Affiliations	Reg. EAP (2019/1167) (EAPASA); IAIAAsa
Awards	Not Applicable

Specialisation	Environmental Impact Assessment; Environmental Management Planning, Environmental Control Officer; Stakeholder Engagement; Water Use Authorisations; Atmospheric Emission Licences; Waste Management License audits; Visual Impact Assessment; Glare Modelling.
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Expertise	<p>Kelly has five years' experience in the ESG sector. Her core expertise includes:</p> <ul style="list-style-type: none"> • coordinating environmental impact assessment processes across a range of sectors; • compiling environmental management programmes for projects; • auditing compliance with environmental management programmes; • managing stakeholder engagement processes; and • managing visual impact assessments, and glint and glare modelling.
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Employment	
2019 - present	SRK Consulting (Pty) Ltd, Environmental Consultant
2018 - 2019	Terramanzi Group, Junior Environmental Consultant

Publications	1. Keeping an Eye on PV Glint and Glare. <i>Multiple publications</i> . August 2022.
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Languages	English – read, write, speak (fluent)
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Kelly Armstrong **Environmental Consultant**

Environmental Impact Assessments (EIA)

- Mainstream Renewable Power South Africa (Pty) Ltd, Scoping and Environmental Impact Report for Hanover WEF and SEF Cluster, 2022 – ongoing, R3 300 000.
- Oceana Group Limited, Basic Assessment (BA) for Oceana's 10 MW SPV Facility in St Helena Bay, Western Cape, 2021 – 2023, R400 000.
- Transnet SOC Ltd, Scoping and EIA for the Increase of Manganese Handling and Storage at the Multi-purpose Terminal, Port of Saldanha, Western Cape, 2021 - 2022, R1 125 000.
- City of Cape Town, EIA for the proposed upgrades of Cape Flats Wastewater Treatment Works, Western Cape, 2019 – 2021, R400 000.
- Eskom Holdings SOC Ltd, Screening Study for 765 kV Kappa – Sterrekus Powerline, Western Cape, 2020 – 2022, R5 000 000.
- Nadeson Consulting Engineers, Middelpoos Stormwater Upgrades EA Amendment, Saldanha Bay, Western Cape, 2020, R25 000.
- Eskom Holdings SOC Ltd, BA for the Single Circuit Powerline from Ceres to Witzenberg Substations, Witzenberg Local Municipality, Western Cape, 2020 – 2021, R435 000.
- Nadeson Consulting Engineers, Middelpoos Stormwater Upgrades Basic Assessment (BA), Saldanha Bay, Western Cape, 2019 – 2020, R250 000.
- Human Settlements Holistic Services, Charlesville Low Cost Housing BA, Cape Town, Western Cape, 2019 – 2021, R150 000.
- Paarl Valleij Developments, BA for Paarl Valleij Residential Development, Western Cape, 2019.
- Copperton Wind Farm, Copperton Wind Energy Facility Environmental Management Programme (EMPr) Amendment, Northern Cape, 2019.
- Val de Vie Investments, Substantive Amendment of Pearl Valley Phase II Environmental Authorisation (EA), Western Cape, 2018 – 2019.
- Val de Vie Investments, Substantive Amendment of Levendal Development EA, Western Cape, 2018 - 2019
- Watchman Properties, BA for Vendome Estate Development, Western Cape, 2018 – 2019.
- Val de Vie Investments, BA for River Farm Estate Development, Western Cape, 2018 – 2019.
- G7 Renewable Energies, Substantive Amendment of Brandvalley Wind Energy Facility EA, Western Cape, 2018.
- Haga Haga Wind Farm, EIA for Haga Haga Wind Energy Facility, Eastern Cape, 2018.
- Haga Haga Wind Farm, BA for Haga Haga Overhead Powerline, Eastern Cape, 2018.

Environmental Management Programme (EMPr)

- Victoria & Alfred Waterfront (Pty) Ltd, Environmental Specification for V&A Revetment Upgrades Phase 2, Granger Bay, March 2021, R35 000
- Victoria & Alfred Waterfront (Pty) Ltd, Environmental Specification for V&A Revetment Upgrades Phase 1, Granger Bay, August 2020, R35 000
- Zutari (Pty) Ltd, Specification for the Environmental Management for the Decommissioning of the Athlone Power Station, 2020, R50 000.

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Environmental Consultant

- Water and Wastewater Engineering (Pty) Ltd, for the City of Cape Town, Cape Flats Aquifer Recharge Water Treatment Plant (WTP) Environmental Method Statement, Western Cape, 2020, R30 000.
- KSS Holdings (Pty) Ltd, EMPr for concrete batching for Karusa and Soetwater Wind Farms, December 2019, R10 000.
- Saint-Gobain Gyproc, Update Maskam Mine EMPr, Vanrhynsdorp, Western Cape, 2019, R200 000.

Environmental Control Officer (ECO)

- Victoria & Alfred Waterfront (Pty) Ltd, V&A Revetment Upgrades, ECO during phase two of the repair works on the Revetments, 2021, R35 000.
- Lions Hill Development Company, The Ridge Residential Development, ECO for Construction Phase, 2020 – 2022, R75 000.
- Project Assignments (Pty) Ltd, Reactor Refurbishments at the Cape Flats and Mitchells Plain WWTW, ECO during the refurbishment, 2020 - 2021, R145 000
- Victoria & Alfred Waterfront (Pty) Ltd, V&A Revetment Upgrades, ECO during repair works on the Revetments, 2020, R35 000.
- Water & Wastewater Engineering (Pty) Ltd, Athlone WWTW Blower House Complex Demolition ECO, ECO during the demolition works, 2020 – 2021, R220 000.
- Coega Development Corporation (on behalf of NDPW), St Helena Bay Fishing Harbour ECO during maintenance dredging. 2019 – 2021, R70 000.
- Coega Development Corporation (on behalf of NDPW), Hout Bay Fishing Harbour ECO during maintenance dredging. 2019 – 2020, R75 000.
- Coega Development Corporation (on behalf of NDPW), Gordon's Bay Fishing Harbour ECO during maintenance dredging. 2019 – 2020, R75 000.
- Coega Development Corporation (on behalf of NDPW), Lambert's Bay Fisheries Harbour ECO during maintenance dredging. 2019 – 2021, R70 000.
- Department of Agriculture, Forestry and Fisheries (DAFF), ECO for operational phase Aquaculture Development Zone, Saldanha Bay. 2019 – 2020, R200 000.
- Evergreen Developments, ECO for construction phase of Evergreen Lifestyle Estate, Paarl, 2018 – 2019.
- Val de Vie Investments, ECO for construction phase of River Club Residential Precinct, Paarl, 2018 – 2019.
- Val de Vie Investments, ECO for construction phase of Pearl Valley Phase II Estate, Paarl, 2018 – 2019.
- Copperton Wind Farm, ECO for construction phase of Copperton Wind Farm, Northern Cape, 2018 – 2019.

Environmental Compliance Audits

- Astron Energy (Pty) Ltd, Waste Management Licence External Compliance Audit: Astron Energy, Milnerton Refinery, 2022, R75 000.
- Tronox Mineral Sands (Pty) Ltd, Fines Dam 6 Environmental Compliance Audits, January 2020, R100 000.
- Astron Energy, EA Audits for Various Astron Energy Projects, Milnerton, Western Cape, 2019, R215 000.

Atmospheric Emission Licences (AEL)

- Tronox Namakwa Sands, AEL Renewal for the Tronox Smelter, Saldanha, Western Cape, 2023, R122 000.

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- Transnet, AEL Variation for Iron Ore Terminal, Port of Saldanha, Western Cape, 2019, R40 000.

Water Use Licences (WUL)

- Eskom Holdings SOC Ltd, BA for the Single Circuit Powerline from Ceres to Witzenberg Substations, Witzenberg Local Municipality, Western Cape, 2020 -2021, R435 000.
- Human Settlements Holistic Services, Charlesville Low Cost Housing General Authorisation, 2019 – ongoing, R150 000.

Visual Impact Assessments (VIA)

- Mainstream Renewable Power South Africa (Pty) Ltd, Visual Fatal Flaw Analysis for Springbok Renewable Energy Cluster, Springbok, Northern Cape, 2023, R15 000.
- SiVEST SA (Pty) Ltd, Shadow Flicker Assessment for Ujekamanzi 1 and 2 WEF, Ermelo, Mpumalanga, 2023, R83 000.
- SiVEST SA (Pty) Ltd, Visual Impact Assessment for Mayogi SPV Facility (including Glint and Glare), Kirkwood, Eastern Cape, 2022, R115 000.
- SiVEST SA (Pty) Ltd, Visual Impact Assessment for Lesaka SPV Facility (including Glint and Glare), Loeriesfontein, Northern Cape, 2022, R120 000.
- SiVEST SA (Pty) Ltd, Visual Impact Assessment for Hendrina South 132 kV Powerline and Substation, Hendrina, Mpumalanga Province, 2022, R60 000.
- SiVEST SA (Pty) Ltd, Visual Impact Assessment for Hendrina North 132 kV Powerline and Substation, Hendrina, Mpumalanga Province, 2022, R60 000.
- SiVEST SA (Pty) Ltd, Visual Impact Assessment (including Glint and Glare) for Bonsmara PV and Associated Infrastructure, Kroonstad, Free State Province, 2022, R72 000.
- Mainstream Renewable Power South Africa (Pty) Ltd, Visual Impact Assessment for the Hanover PV and WEF Cluster, Hanover, Northern Cape, 2022 – ongoing, R141 000
- Mainstream Renewable Power South Africa (Pty) Ltd, Visual Impact Assessment for the Stilfontien SPV Cluster and Associated Infrastructure, Stilfontein, North West Province, 2022, R95 000.
- Oceana Group Limited, Visual Impact Assessment for Oceana's 10 MW SPV Facility in St Helena Bay, Western Cape, 2021 – ongoing, R70 000.
- The Environmental Partnership, VIA for the Wingfield Interchange Upgrade BA, Cape Town, Western Cape, 2021, R56 000.
- Mineral Sand Resources (Pty) Ltd, VIA for the Tormin Mine Expansion EIA, Matzikama Local Municipality, Western Cape, 2021, R131 166.
- Mineral Sand Resources (Pty) Ltd, Visual Specialist Study for the De Punt Baseline Study, Matzikama Local Municipality, Western Cape, 2021, R95 466

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Profession	Environmental Practitioner
Education	MPhil (EnvSci), Cape Town, 1994 BBusSc (Hons), Cape Town, 1985
Registrations/ Affiliations	Registered Environmental Assessment Practitioner (South Africa) Member International Association of Impact Assessment Director SRK South Africa 2018 - 2021 Director SRK Australia 2019 - 2023 Director SRK Investments 2011 - 2020 Director SRK Global 2013 - 2017 SRK Cape Town Managing Partner 2007 – 2015

Specialisation ESG consulting.

Expertise Chris Dalgliesh has been involved in management and environmental projects for the past 36 years. His expertise includes:

- EIA and ESIA (EMPR);
- environmental and social due diligence;
- socio-economic impact assessments;
- stakeholder engagement;
- strategic environment assessments and management plans;
- state of environment reporting;
- environmental management frameworks;
- site safety reports for the nuclear industry;
- natural resource management;
- waste management.

Employment

2000 – present	SRK Consulting (Pty) Ltd, Director, Partner and Principal Environmental Consultant
1999 – 2000	Arcus Gibb (Pty) Ltd, Associate, Cape Town, South Africa
1996 – 1998	African Environmental Solutions (Pty) Ltd, Senior Environmental Consultant
1994 – 1996	Environmental Evaluation Unit, Environmental Consultant, UCT
1991 – 1993	Novello Music Publishers, Marketing Manager, London, UK
1988 – 1990	JR Phillips, Product Manager, Wokingham, UK
1986 – 1988	Unilever, Trade and Assistant Brand Manager, Durban, South Africa

Publications I have been interviewed and quoted in numerous environmental and sustainability articles published in the press and sector specific journals, including *Engineering News*, *Mining News*, *Business Report* and *Cape Times*, and am a frequent guest lecturer.

Languages English – read, write, speak
Afrikaans – read, write, speak
Dutch - read

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Environmental and Social Impact Assessment (ESIA) and Environmental Management Programmes (EMP)

- Mainstream Renewable Power South Africa (Pty) Ltd, Port Nolloth Fatal Flaw Study, Northern Cape, South Africa, August 2023 – ongoing, R 195 000
- Mainstream Renewable Power South Africa (Pty) Ltd, Springbok Cluster Fatal Flaw Study, Northern Cape, South Africa, June 2023 – ongoing, R 100 000
- Red Cap, Renoster Wind Farm EIA, Edenville, Free State Province, South Africa, May 2023 – ongoing, R 3 820 000
- Staatsolie Maatschappij Suriname, Produced Water Re-injection (PWRI) Project EIA, Saramacca, Suriname, 2022 – ongoing, US\$65 000
- AES, Cabinda Total Waste Management Facility FS: Environmental Screening Study, Cabinda, Angola, 2022 – ongoing, US\$26 000
- Mainstream Renewable Power South Africa (Pty) Ltd, EIA for Hanover SPV and Windfarm and Associated Infrastructure, Eastern Cape Province, South Africa, 2022 – ongoing, R 2 300 000
- Mainstream Renewable Power South Africa (Pty) Ltd, EIA for Stilfontein SPV Cluster and Associated Infrastructure, North West Province, South Africa, 2021 – ongoing, R 2 100 000
- PetroSA, PetroSA Gas to Power EIA, Mossel Bay, Western Cape, South Africa, 2021 – 2023, R 750 000
- Oceana Group Limited, Basic Assessment for 10 MW SPV Facility, St Helena Bay, Western Cape, South Africa, 2021 – ongoing, R 400 000
- Samara Mining (Pty) Ltd, Offshore Diamond Prospecting EIA, Offshore, West Coast, South Africa, 2021-2022, R 1 250 000
- Blue Crane Funerals, EIA for a Crematorium, Strand, Western Cape, 2021 – ongoing, R400 000
- Mineral Sand Resources, Tormin Mine Inland EIA, Lutzville, Western Cape Province, 2021 – ongoing R2 500 000
- AES, Bengo Landfill EIA, Angola, 2021 - ongoing, US\$80,000
- Mineral Sand Resources, De Punt Prospecting Block Baseline Study, Lutzville, Western Cape Province, 2021 – ongoing R1 000 000
- Coega Development Corporation, four EIAs for Gas to Power Plants (3 000MW), Eastern Cape Province, South Africa, 2020 – ongoing, R2 800 000
- Tronox Mineral Sands, EIA for East Mine In-Pit Residue Storage Facility, Namakwa Sands Mine, Brand se Baai, South Africa, 2019 – 2021, R900 000
- N.V. Energiebedrijven Suriname, ESIA for Tout lui Faut Kanaalweg Power Plant, Wanica District, Suriname, 2019, US\$115 000
- Eskom, EIA for Kappa-Sterrekus Powerline, Western Cape Province, South Africa, 2019 - ongoing, R3 000, 000
- Staatsolie Maatschappij Suriname, ESIA for Cyclic Steam Stimulation Enhanced Oil Recovery Project, Saramacca District, Suriname, 2019, US\$50 000
- Staatsolie Maatschappij Suriname, ESIA for Polymer Flood Enhanced Oil Recovery Project, Saramacca District, Suriname, 2019, US\$85 000
- Maritieme Autoriteit Suriname, ESIA for Suriname River Dredging Project, Suriname, 2019, US\$185 000

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- Staatsolie Maatschappij Suriname, ESIA for Saramacca Power Plant, Saramacca District, Suriname, 2018 - 2019, US\$125 000
- Tronox Mineral Sands, EIA for coastal setback prospecting, Namakwa Sands Mine, Brand se Baai, South Africa, 2018 – ongoing, R800 000
- Motaengil Africa, IFC compliant EIA for Patriota Hospital, Luanda, Angola, 2018 – ongoing, R640 000
- Ricocure (Pty) Ltd, EIA for Exploration Right application for Offshore Block 3B, West Coast, South Africa, 2018-2019, R150 000
- Sezigyn (Pty) Ltd, EIA for Exploration Right application for Offshore Mid-Orange Basin, West Coast, South Africa, 2018-2019, R150 000
- Rheinmetall Denel, Multi Purpose Nitration Plant EIA, Wellington, Western Cape Province, South Africa, 2018 - ongoing, R650, 000
- Impact Oil and Gas, Orange Deep Basin Seismic Survey EIA, Offshore West Coast, South Africa, 2017, R600,000
- Sungu Sungu Oil (Pty) Ltd, Pletmos Basin EIA, Offshore Southern Cape, South Africa, 2017, R525,000
- City of Cape Town, Vissershok North Landfill Waste Management Licence, Cape Town, Western Cape Province, 2016 – ongoing, R1 250,000
- Mineral Sand Resources, Tormin Mine EIA, Lutzville, Western Cape Province, 2016 – ongoing R1 250 000
- Department of Agriculture, Forestry and Fisheries, Project Definition and EIA for a proposed Aquaculture Development Zone in Saldanha Bay, Western Cape, 2016 – 2018, R1,000,000
- Easigas, EIA for LNG Plant, Mossel Bay, Western Cape Province, South Africa, 2016 – 2017, R600,000
- Gyproc St Gobain, EMPr for gypsum mine, Vanrhynsdorp, Western Cape Province, South Africa, 2016, R125,000
- Tronox Namakwa Sands, EIA for new slimes dam, Brand se Baai, Western Cape Province, South Africa, 2015 – ongoing, R900,000
- The River Club, EIA for redevelopment of the property, Cape Town, Western Cape Province, South Africa, 2015 – ongoing, R1 900,000
- SIMO Petroleum Ltd, ESIA for fuel supply project, Guinea, 2015, US\$200,000
- SIMO Petroleum Ltd, EIA for fuel supply project, Liberia, 2015, US\$200,000
- Eskom, EIA for Transient Interim Storage Facility, Western Cape, South Africa, 2015 – ongoing, R900,000
- Falcon Oil & Gas, Environment Management Programme Report (EMPr) update and engagement, Western, Northern and Eastern Cape, South Africa, 2014 – 2015, US\$90,000
- Department of Environmental Affairs (DEA), Waste Management Licence applications and Basic Assessment for 20 waste facilities, Western Cape, South Africa, 2014 – 2015, R2,600,000
- Sable Mining / West Africa Explorations (WAE), Cumulative Impact Assessment (CIA) for WAE's Nimba iron ore mine, Guinea, May 2014 – on hold, US\$90,000
- De Beers Buffalo Camp, Basic Assessment and EMPr Amendment, Kimberley, Northern Cape, 2014, R260,000
- EFG Engineers, EIA for Hermanus bypass road, Western Cape Province, South Africa, 2014 – 2017, R1,200,000
- SRK Turkey, CIA of Copler gold mine, Turkey, 2014, US\$30,000

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- Sable Mining Africa Ltd, ESIA for railway line and port expansion, Liberia, 2014, US\$480,000
- Tronox Namakwa Sands, EIA for abalone farm, Brand se Baai, Western Cape Province, South Africa, 2014 – ongoing, R1,050,000
- Matzikamma Municipality, EIAs for three abalone farms, Doringbaai, Western Cape Province, South Africa, 2014 – 2017, R1,100,000
- De Beers, EMPr amendment for fine residue pond, Kimberley, South Africa, 2013, R120,000
- AES, ESIA of landfill, Soyo, Angola, 2013, US\$70,000
- PetroSA, EIA of offshore gasfield, Southern Cape, South Africa, 2013 – ongoing, R500,000
- EnergieBedrijven Suriname, ESIA for new power plant, Suriname, 2013, US\$135,000
- AES, ESIA of Thermal Desorption Unit, Soyo, Angola, 2013, US\$65,000
- Staatsolie Maatschappij Suriname, Rapid EIA of power plant expansion, Suriname, September 2012 – 2014, US\$100,000
- BP, ESIA of Blocks 18 & 31 Drilling and Seismic Survey, Angola, 2012, US\$40,000
- Frontier, EIA for desalination plant and water pipeline, Abraham Villiers Bay, Northern Cape, South Africa, August 2012 – ongoing, R1,250,000
- Tronox Namakwa Sands, EIA /EMPr for two mining application areas, Namakwaland, Western Cape Province, South Africa, 2012 – ongoing, R1,250,000
- Airports Company South Africa, EIA of realignment of runway, Cape Town International Airport, Western Cape, South Africa, R3,175,000
- Grindrod Mauritius, EIA of Matola Coal Terminal Phase 4 Expansion, Maputo, Mozambique, 2012 - 2013, US\$425,000
- Maersk, ESIA of Block 16 Seismic Survey, Angola, 2010 – 2011, US\$25,000
- Staatsolie Maatschappij Suriname, EIA for diesel, gasoline and LGP pipelines, Suriname, October 2011 – 2013, US\$120,000
- Premier Fishing, EIA for re-establishment of fishmeal plant, Saldanha Bay, South Africa, May 2011 – 2015, R1,200,000
- Eni Angola BV, ESIA of development of Block 15/06 West Hub oil fields, Angola, 2011 - 2013, US\$110,000
- Falcon Oil & Gas, EMPr, Western, Northern and Eastern Cape, South Africa, 2010 – 2011, US\$100,000
- Great Western Minerals Group, EIA and EMPr of rare earth mine, Vanrhynsdorp, Western Cape, South Africa, 2010 – 2012, R1,760,000
- Vale, ESIA of phosphate mine, Nampula Province, Mozambique, 2010 – 2013, US\$630,000
- Sonangol Lda, EIA (x6) of onshore hydrocarbon facilities, Luanda, Malange and Lubango, Angola, March – November 2010, US\$280,000
- Empresa Moçambicana de hidrocarbonetos and Buzi Hydrocarbons Pty Ltd, ESIA for seismic surveys and exploration drilling in Buzi Block, Sofala Province, Mozambique, 2009 – 2010, US\$200,000
- Staatsolie, ESIA of refinery expansion, Paramaribo, South America, 2009 – 2010, US\$400,000
- Sasol Technology, EIA for proposed new gas pipeline from Ressano Garcia to Moamba, Mozambique, Moamba, Mozambique, 2009 – 2010, R1,000,000
- Anglo American, State of Environment Report, Strategic Environment Assessment, and ESIA of Gamsberg zinc mine, Aggeneys, South Africa, 2008 – 2010, R13,000,000

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- CIC Energy, Environmental screening and fatal flaw assessment of Trans Kalahari Railroad and port, Botswana and Namibia, 2008 – present, R1,300,000
- BHP Billiton, ESIA of Corantijn River dredging, Suriname, 2007 – 2008, US\$750,000
- BHP Billiton, ESIA of Bakhuis transport project, Suriname, 2006 – 2008, US\$1,600,000
- Altona Developments, EIA of mixed development, Worcester, Western Cape Province, South Africa, 2006 – 2010, R750,000
- BHP Billiton, ESIA of Bakhuis bauxite mine, Suriname, 2005 – 2008, US\$3,200,000
- Levendal Developments (Pty) Ltd, EIA of mixed development, Suider-Paarl, Western Cape Province, South Africa, 2005 – 2008, R450,000
- Bevcan, Angola, EIA of canning facility, Viana, Angola, 2005 -2010, US\$75,000
- Chevron Texaco, EIA of landfill, Cabinda, Angola, 2004 – 2005, US\$90,000
- Attpower Developments (Pty) Ltd, EIA of mixed coastal development, Mossel Bay, Western Cape Province, South Africa, 2004, R600,000
- Intels Services Luanda, EIA of landfill, Cacuaco, Angola, 2004, US\$65,000
- Kwezi V3, EIA of waste water treatment works, Gansbaai, Western Cape Province, South Africa, 2003 – 2005, R350,000
- City of Cape Town, EIA of Fisantekraal waste water treatment works, Cape Town, Western Cape Province, South Africa, 2003 – 2004, R450,000
- St Francis Bay Municipality, EIA of beach remediation, St. Francis Bay, Eastern Cape Province, South Africa, 2002 – 2003, R300,000
- City of Cape Town, Environmental Impact Control Report of Vissershok North landfill, Western Cape Province, South Africa, 2001 – 2004, R175,000
- NDC, EMPr for NDC diamond mine, Vredendal district, Western Cape Province, South Africa, 2001 – 2003, R800,000
- Coega Development Corporation, EIA for rezoning, Eastern Cape Province, South Africa, 1999, R85,000
- BHP Billiton, EIA (Scoping) of Alusaf Hillside smelter, Richards Bay, KwaZulu-Natal Province, South Africa, 1999, R150,000
- Gencor, EIA of zinc refinery and phosphoric acid plant, Port Elizabeth, Eastern Cape Province, South Africa, 1995 – 1998, R800,000
- Duferco, EIA of steel rolling mini-mill, Saldanha, Western Cape Province, South Africa, 1997, R90,000
- Hoechst, EIA of polymer extension, Durban, KwaZulu-Natal Province, South Africa, 1993 – 1994, R280,000

Environmental Planning and Natural Resource Management

- AES, Angola Waste Valorisation and Greenhouse Gas Emissions Management Plan, Luanda and Soyo, Angola, 2022 – ongoing, US\$18 000
- Mineral Sand Resources, West Matzikama Strategic Environmental Assessment Terms of Reference, Lutzville, Western Cape Province, 2021 R180 000
- Tronox Mineral Sands (Pty) Ltd, renewal of the Atmospheric Emission Licence for the Namakwa Sands UMM Plant, Brand-se-Baai, Western Cape, 2018-ongoing, R320 000
- Tronox Mineral Sands (Pty) Ltd, renewal of the Atmospheric Emission Licence for the Namakwa Sands Mineral Separation Plant, Koekenaap, Western Cape, 2018-ongoing, R290 000

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- Tronox Mineral Sands (Pty) Ltd, renewal and variation of the Atmospheric Emission Licence for the Namakwa Sands Smelter Plant, Saldanha, Western Cape, 2018-ongoing, R300 000
- Kudumane Manganese Resources, EMP Amendment for KMR Manganese Mine, Hotazel, Northern Cape, 2017 – ongoing, R170 000
- Eskom, Ecological Reports, Duynefontyn and Thyspunt, Nuclear Site Safety Reports Update, South Africa, 2017 – present, R800,000
- DEA&DP, Western Cape State of Environmental Report, 2017, R1,700,000
- Tronox Namakwa Sands, Development of Closure Commitments and Rehabilitation Monitoring Plan Namakwaland, Western Cape Province, South Africa, 2015 – ongoing, R600,000
- West Coast District Municipality, Integrated Coastal Management Plan, West Coast, South Africa, 2012 – 2013, R700,000
- City of Cape Town, Environmental Management Framework and control zones, Cape Town, Western Cape Province, South Africa, 2008 – 2009, R600,000
- Eskom, Ecological Reports, Koeberg, Bantamsklip and Thyspunt, South Africa, 2008 – 2013, R900,000
- City of Cape Town, Environmental Management Framework and control zones, Cape Town, Western Cape Province, South Africa, 2008, R500,000
- Knysna Municipality, State of Environmental Report, Western Cape Province, South Africa, 2004 – 2005, R130,000
- DEA&DP, Western Cape State of Environmental Report, 2004 – 2005, R1,400,000

Environmental and Social Review and Due Diligence

- Eskom Holdings Limited SOC Ltd, Nuclear Power Station EIA Review, Duynefontein, Western Cape, South Africa, 2023, R 2 700 000
- Vedanta - Black Mountain Mining (Pty) Ltd, BMM and Gamsberg Water Use Licence and EMPr Performance Assessment, Northern Cape Province, South Africa, 2023, R210 000
- UniCredit, Environmental and Social Action Plan and Performance Review of Caculo Cabaca Hydropower Dam, Angola, 2022 - 2023, €320 000
- HSBC, Annual Monitoring Reports for MIGA Review, Cambambe Hydropower Dam, Angola, 2019 – 2021, €110 000
- Vedanta - Black Mountain Mining (Pty) Ltd, BMM and Gamsberg Water Use Licence and EMPr Performance Assessment, Northern Cape Province, South Africa, 2021, R105,000
- HSBC, Environmental and Social Due Diligence and Annual Review of Lauca Hydropower Dam, Angola, 2014 – 2021, €410 000
- Eramet Comilog Manganese, Environmental Regulatory Due Diligence of Heavy Minerals Mine, Alexander Bay, South Africa, 2020, €11 000
- HSBC, Environmental and Social Compliance Monitoring of Fertilizer Plant and Railway Line, Ghorashal, Bangladesh, 2020 – 2032, \$670 000
- BNP Paribas, Environmental and Social Due Diligence of Elandsfontein mine Expansion, Langebaan, South Africa, 2020, R115 000
- Euler Hermes/ UniCredit / Voith, Environmental and Social Due Diligence and Action Plan of Caculo Cabaca Hydropower Dam, Angola, 2020, €30 000

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- Vedanta - Black Mountain Mining (Pty) Ltd, BMM and Gamsberg EMPr Performance Assessment, Northern Cape Province, South Africa, 2019, R125,000
- Easigas, ESDD of Avedia LPG terminal, Saldanha Bay, South Africa, 2018, R90 000
- Kropz, Environmental and Social Due Diligence for Competent Persons' Report, Elandsfontein mine, Langebaan, South Africa, 2018, R130 000
- Standard Bank South Africa Limited, Environmental and Social Due Diligence and Environmental and Social Action Plan (ESAP) for Caculo Cabaca Hydropower Dam, Angola, 2017, \$23 000
- Voith Hydro, Zenzo Hydroelectric Project Gap Analysis and Environmental and Social Action Plan, Angola, 2017, €30 000
- Voith Hydro, Koyscha Hydroelectric Project Gap Analysis, Ethiopia, 2017, €15 000
- AES, Cacuaco Landfill Environmental Compliance Audit, Luanda, Angola, 2017, US\$17,500
- Industrial and Commercial Bank of China, Environmental and Social Due Diligence and Environmental and Social Action Plan (ESAP), and Annual Compliance Audits for Caculo Cabaca Hydropower Dam, Angola, 2016-2017, \$31 000
- Deutsche Bank, Environmental and Social Due Diligence and Annual Review of Be'er Tuvia Combined Cycle Gas Turbine Power Plant, Israel, 2016 – 2022, €150 000
- Confidential, Environmental and Social Gap Analysis of Caculo Cabaca Hydropower Dam, Angola, 2016, €20 000
- BNP Paribas, Environmental and Social Due Diligence of Elandsfontein mine, Langebaan, South Africa, 2015, R60,000
- Tronox Namakwa Sands, Water Use Licence Audit(s), Namakwaland, Western Cape Province, South Africa, 2015 and 2014, R175,000 (x2)
- Tronox Namakwa Sands, EMPr Performance Assessment, Namakwaland, Western Cape Province, South Africa, 2014, R175,000
- West Africa Exploration Ltd, Environment and social gap analysis of Nimba iron ore mine, Guinea, 2014, US\$80,000
- HSBC, Environmental and Social Due Diligence and Annual Review, Cambambe Hydropower Dam, Angola, 2013 – 2017, €255,000
- Tronox Namakwa Sands, EMPr Performance Assessment, Namakwaland, Western Cape Province, South Africa, 2012 – 2013, R150,000
- Biovac, Environmental due diligence audit of pharmaceutical plant, Cape Town, Western Cape Province, South Africa, 2012, R100,000
- SRK UK, Environmental Due Diligence of phosphate mine, Brazil, 2010, US\$15,000
- SRK Russia, Environmental Due Diligence of Rossing South uranium mine, Namibia, 2009, US\$12,000
- SonaGas, EIA external review of LNG plant EIA, Soyo, Angola, 2006, US\$50,000
- Confidential, Environmental Due Diligence, Cape Town, Western Cape Province, South Africa, 2004, R80,000
- Netherlands Commission for EIA, External EIA review of Mavoco hazardous landfill EIA, Maputo, Mozambique, 2002, R30,000

Management Plans

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- Black Mountain Mining (Pty) Ltd, Gamsberg Mine IWWMP Update, Aggenys, Northern Cape Province, South Africa, 2018 – ongoing, R185 000
- West Africa Exploration Ltd, Stakeholder Engagement Plan, Guinea, 2014, US\$15,000
- West Africa Exploration Ltd, Biodiversity Action Plan, Guinea, 2014, US\$20,000
- Tronox Namakwa Sands, Integrated Water and Waste Management Plan for Namakwa Sands mine, Namakwaland, Western Cape Province, South Africa, 2013 – 2014, R125,000
- Tronox Namakwa Sands, Integrated Water and Waste Management Plan for Namakwa Sands Smelter, Saldanha Bay, Western Cape Province, South Africa, 2013, R110,000
- BHP Billiton, Conceptual Closure and Rehabilitation Plan, Suriname, 2007 – 2013, US\$210,000
- Namakwa Sands, Closure Plan, Namakwaland, Northern Cape Province, South Africa, 2003, R170,000

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Socio Economic Impact Assessments

- Mineral Sand Resources, Tormin Mine Socio-Economic Benefits Assessment, Lutzville, Western Cape Province, 2021 R165 000
- Department of Environmental Affairs and Development Planning (DEA&DP), Papenkuils Wetland Valuation, South Africa, 2020 – 2021, R500 000
- Departments of Public Works and Basic Education, Helderberg School and Hospital Socio-economic impact assessment, South Africa, 2020, R80 000
- Client: RSK, Basra Master Plan: Modelling of Economic and Population Dynamics, Iraq, 2020 – 2021, \$15 000
- Aecom, Social Impact Assessment of Kayamandi Bulk Water Pipeline, South Africa, 2020 - 2021, R80 000
- Allied Gold Corp, Economic specialist study for the Dish Mountain Gold Project, Ethiopia, 2018 – ongoing, \$11 000
- Joule Africa, Initial Environmental and Social Assessment of the KPEP Hydropower Project, Cameroon, 2018 – ongoing, \$10,800
- Anglo Gold Ashanti, Economic Baseline Report for Siguiri Gold Mine, Guinea, 2018, R130 000
- Pam Golding / Pennyroyal (Gibraltar) Ltd., Economics benefits analysis of Amber Resort Development, Zanzibar, Tanzania, 2017, R300 000
- RSK, EACOP Pipeline Economic Study, Uganda and Tanzania, 2017, \$ 40,000
- Tronox, Socio-Economic Impact Assessment of Mining and Associated Operations, South Africa, 2017, R120 000
- SRK UK, Sintoukola Potash Mine Economic Impact Assessment, Republic of Congo, 2012, \$30,000
- Staatsolie Maatschappij Suriname, Refinery Expansion Community Relations Plan, Suriname, 2011, \$120,000
- SRK UK, Reko Diq Phosphate Mine Review of Economic Impact Assessment, Pakistan, 2010, \$7,500
- DEADP, Western Cape State of the Environment Report Economic Study, 2004, R40,000