2015

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED UPGRADE OF THE ESKOM ARIES SUBSTATION AND CONSTRUCTION OF APPROXIMATELY 5KM 50kV POWER LINE FROM ARIES TO THE PROPOSED NEW TRANSNET ARIES TRACTION FEEDER SUBSTATION

NSOVO ENVIRONMENTAL CONSULTING

DOCUMENT CONTROL

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Quality Control		
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ACRONYMS	
BAR	Basic Assessment Report
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CEO	Contractor Environmental Officer
DAFF	Department of Agriculture Forestry and Fishery
DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EA	Environmental Authorisation
ECA	Environmental Conservation Act, 1989 (Act 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
HSA	Hazardous Substance Act (Act 15 OF 1973)
HIA	Heritage Impact Assessment
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMWA	National Environmental Management Waste Act (Act 36 of 2008)
NEMAQA	National Environmental Air Quality Act (Act 39 of 2004)
NEMBA	National Environmental Management Biodiversity Act (Act 10 of 2004)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
OHSA	Occupational Health and Safety Act (Act of 85 of 1993)
SACNASP	South African Council of Natural Scientist Profession
SAHRA	South African Heritage Resources Agency
Tx	Transmission
WULA	Water Use Licence Application

1 INTRODUCTION

The construction of infrastructure can have a major impact on the natural environment. It is therefore imperative that precautions are taken to ensure that environmental degradation is minimised while the project is undertaken. This will take a concerted effort from the project team and proper planning is of the utmost importance.

Nsovo Environmental Consulting has been appointed by Eskom Holdings SOC Limited (hereafter Eskom) to compile an Environmental Management Programme (EMPr) which will be a guideline for the mitigation and management measures to be implemented during the construction phase of the project as well as during the operational phase. This EMPr is a living document that guides the day to day activities throughout the lifecycle of the project; it may from time to time, require revisions as may be dictated by the course of construction.

This EMPr has been compiled in compliance with section 28 of the National Environmental Management Act, 1998 (Act 107 of 1998) which imposes a duty of care and remediation of environmental damage.

The purpose of the EMPr is to give effect to precautionary measures, which are to be put in place for controlling the activities that take place on site. It has been developed to ensure compliance with National legislative and regulatory requirements.

2 DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo is conversant with the definition and general requirements of an Environmental Assessment Practitioner (EAP) as defined in Section 1 the National Environmental Management Act, 1998 (No 107 of 1998) (NEMA) and Regulation 13 of the Environmental Impact Assessment Regulations promulgated in December 2014. Nsovo is:

- Independent and Objective;
- Has expertise in conducting EIA's;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 2: Details of the EAP

Name of Company	Nsovo Environmental Consulting
Person Responsible	Masala Mahumela Pr.Sci.Nat.
Professional Registration	Registered with the South African Council for Natural Scientific Professions (SACNASP).
Postal Address	P/Bag x29, Postnet Suite 696 Gallo Manor 2052
Telephone Number	011 312 5153
Fax Number	086 602 8821
Email	masala.mahumela@nsovo.co.za
Qualifications & Experience	B.Sc. Honors Environmental Management B.Sc. Environmental Sciences **8 years of experience**
Project Related Expertise	In terms of project related expertise the EAP has completed the following projects: • Basic Environmental Assessment for the Vaal River water pipeline for AngloGold Ashanti Mine's Vaal River Operations (North West Province, South Africa). • Environmental Impact Assessment (EIA) for Eskom's Isundu-Mbewu 400kV transmission power lines in KwaZulu-Natal (KwaZulu-Natal Province, South Africa). • Basic Environmental Assessment for the West Wits Tau Tona pipeline in Carletonville (Gauteng Province, South Africa). • Environmental Impact Assessment (EIA) for the realignment of the Sasol Gas pipeline in Tembisa (Gauteng Province, South Africa). • Environmental Impact Assessment (EIA) for the deviation of the Sasol Gas pipelines in Dalview, Elspark, Verword Park, Burton Park and Mindalore (Gauteng Province, South Africa).

CV attached as Appendix E.

3 PROJECT DESCRIPTION

The Sishen-Saldanha line, Transnet Freight Rail's (TFR) export iron ore corridor, forms the backbone of the company's growth strategy. As part of the Transnet Orex expansion, TFR will be replacing the 9E Electrical Locomotives and Diesel Locomotives with the new energy efficient 15E Electrical Locomotives.

Consequently, to enable TFR to expand their operations without overloading and interruption of supply, the proposed development entails the following:

- Construction of approximately 5km of the 50 kV power line in parallel to the existing line from Eskom Aries substation to the proposed new Transnet Traction Feeder substation. The new line will have three single phase supplies each rated at 60MVA;
- Installation of 1x60 MVA 400/50 kV transformer;
- Connect in parallel the existing 2x40 MVA 400/50kV transformers and make them to feed south of the substation;
- Development of the Transnet Traction feeder substation; and
- Decommissioning of the existing 50kV power lines.

The aforementioned development triggers a listed activities under GNR 584 (Listing Notice 1) Activity therefore Environmental Authorisation was issued by the Department of Environmental Affairs on 31 March 2015 and 02 April 2015 in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations of 2010.

3.1 DESCRIPTION OF LOCALITY

The proposed project will be located on Farm Klein Zwart Bast 188 Portion 1, 2 and 4 within the jurisdiction of Kai !Garib Local Municipality in the Northern Cape Province of South Africa. The proposed line will require approximately 30 meter servitude however; the environmental assessment earmarked a 200m corridor as depicted in the Locality map below.

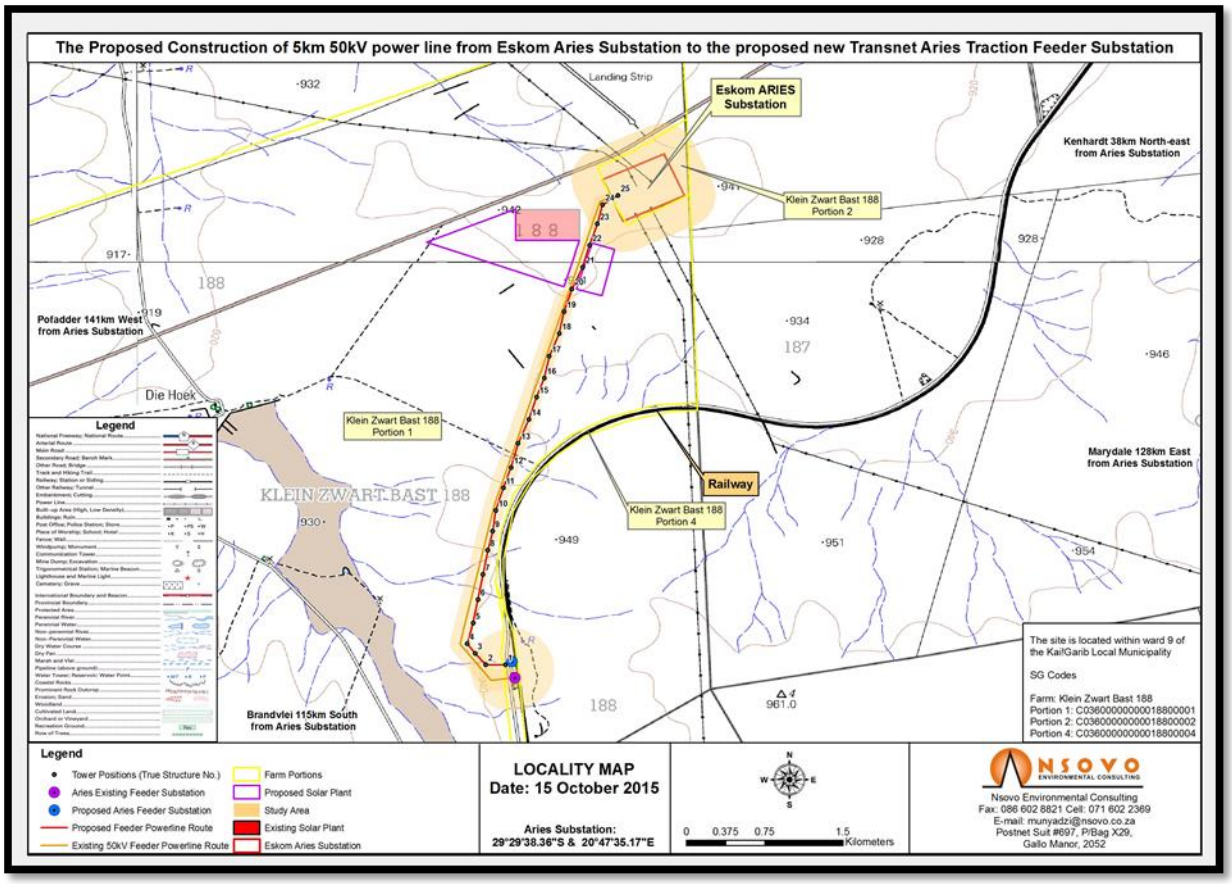


Figure 1: Substation site and loop in loop out lines

4 PURPOSE AND SCOPE OF THE EMPR

The EMPr sets out general environmental specifications, which are applicable to the construction activities associated with the proposed project. This document serves as a guideline for the management of the site and provides specifications and regulations that must in all instances be adhered to. It is the responsibility of all parties, including Contractors and sub-contractors, involved in the project to commit themselves to the implementation of the EMPr in all phases of the project, or in those instances where specific instructions are provided.

The objectives of the EMPr are to:

- Ensure that the activity is undertaken in compliance with national and provincial environmental legislations as well as local by-laws and policies.
- Ensure that Eskom Transmission's Environmental Policy, TRMPBAAX3 Rev 3, is underwritten at all times;
- All Landowner special conditions are identified and taken into consideration as the proposed projects is located adjacent to other private properties;
- Ensure that all environmental conditions stipulated in the EA are implemented;

- Detail mitigation measures, time-frames and criteria for assessing the success or failure of each measure;
- Provide detailed monitoring programmes to ensure compliance;
- Provide input and strategies for environmental quality control and risk management;
- To preserve the natural environment by limiting destructive actions on site;
- Ensure appropriate restoration of areas affected by construction; and
- Prevent long term environmental degradation.

5 GENERAL ENVIRONMENTAL GUIDELINES FOR THE CONSTRUCTION PHASE

This EMPr has been compiled in fulfillment with requirements of Section 28 of the National Environmental Management Act, 1998 (Act 107 of 1998) and is therefore legally binding. This document serves as a guideline for the management of the site by the Authorisation holder (Eskom) and his/her Contractor and subcontractors, in order to minimise adverse environmental impacts. Eskom will be responsible for ensuring compliance of the Contractor with the EMPr and will rely on the Environmental Control Officer (ECO) to monitor compliance. The Contractor must in turn monitor his employees to ensure compliance with the provisions of the EMPr.

The main Contractor shall receive a copy of the EMPr from Eskom on which he / she will be given the opportunity to clear any misconceptions and uncertainties. The EMPr will form part of the contract and will therefore be a legally binding document. In the event of discrepancy with regard to environmental matters or environmental specifications this document shall take precedence.

6 APPLICABLE LEGISLATION

This list is not intended as an exhaustive analysis of the applicable environmental legislations but provides a guideline to the relevant aspects of each Act.

Table 1: Legislation pertaining to the proposed project

Aspect	Relevant Legislation	Brief Description
Environment	National Environmental Management: Act 1998, (Act No. 107 of 1998)	The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), The principles set out in the National Environmental Management Act, 1998 (Act No. 107 of 1998), hereafter, referred to as NEMA, apply to all listed projects.

Aspect	Relevant Legislation	Brief Description
		Construction and operation have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).
Air quality management and control	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	The object of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air and to prevent pollution of air and ecological degradation. Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. Whilst none are promulgated at present, it provides that the Minister or MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance by dust or

Aspect	Relevant Legislation	Brief Description
		other measures aimed at the control of dust.
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr. Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation , 1989 (Act 73 of 1989).
Water	National Water Act, 1998 (Act 36 of 1998)	This Act provides for fundamental reform of law relating to water resources and use[1]. The preamble to the Act recognizes that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users.
Waste	National Environmental Management: Waste Act, 2008 (Act 58 of 2008)	The objectives of the Act are to protect health, well-being and the environment by providing reasonable measures for avoiding and minimising the generation of waste; reducing, re-using, recycling and recovering waste and generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources in order to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act.

Aspect	Relevant Legislation	Brief Description
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996	The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). In terms of Section 7, the state is obliged to respect, promote and fulfill the rights in the Bill of Rights. The environmental right states that: "Everyone has the right - a) To an environment that is not harmful to their health or well-being; and b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – -Prevent pollution and ecological degradation; -Promote conservation; and -Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

6.1 STANDARD ESKOM POLICIES TO BE COMPLIED WITH

In addition to the approved EMPr, the EA and other permits and licenses, the construction activities must also comply with the standard Eskom documents listed below. It is the responsibility of all parties involved in the implementation of the EMPr to ensure that the most recent updated Eskom policies/documents are used. Policies are attached as Appendix C.

6.2 METHOD STATEMENTS FOR THE ACTIVITIES TO BE CARRIED OUT

The following Method Statements (MS) must be prepared and signed by the Eskom's construction team, ECO and the Contractor prior to commencement of activities on site:

- Vegetation clearing;

- Fauna and flora management;
- Excavations for construction of substation and installation of pylons;
- Chemical/hazardous substance storage;
- Cement/concrete use;
- Logistics of the environmental awareness training;
- Fire management;
- Emergency Response;
- Storm water and soil erosion management;
- Waste management;
- Access road(s);
- Contaminated water management;
- Site establishment and site layout plan;
- Use of herbicides/pesticides;
- Temporary site closure;
- Site Rehabilitation;
- Alien plants removal and use of herbicides and pesticides
- Dust suppression

This list has not exhausted all the activities/aspects that may require MS prior to commencement of the work. The ECO may require more MSs to be submitted as the project progresses.

7 PROJECT TEAM

7.1 ROLES AND RESPONSIBILITIES OF THE PROJECT TEAM

7.1.1 Environmental Control Officer

An independent Environmental Control Officer (ECO) must be appointed to assist the Contractor(s) on site regarding environmental matters. The primary role of the ECO is as follows:

- To provide an on-site environmental management service to Eskom to ensure effective implementation of EA, EMPr and landowner conditions.
- To ensure implementation and compliance with any Eskom site procedures and requirements.

- Be responsible for the planning and management of all environmental activities for this position, but more specifically the following:

  - Communication Services
    - To liaise closely with the Eskom and Contractor's Environmental Officer (EO)
    - To ensure that the landowners agreed General and Special Conditions are implemented.
    - To negotiate the Access Plan between landowners and Contractor and to ensure its implementation, so as to provide timeous servitude access to the Contractor to carry out its duties with as little interference/objections as possible.
    - ECO must identify if any large turning circles are required for large machinery, before this access is negotiated.
    - To agree with landowners where gates are to be installed at fence crossings, before the Contractor gains entry to the properties for construction activities.
    - To agree with landowners on the bush clearing method. To assist the Contractor's Environmental Officer (EO) in conflict resolution.
    - Measuring and evaluating crop damage and other related claims, resulting from the construction activities, in conjunction with the landowner and submitting the relevant forms to the Project Manager for payment to the landowner (but not where the Contractor was negligent). This to be done equitably and timeously.
    - To ensure that the Contractor rehabilitates any damage caused during construction.
    - To indicate where bird guards, bird diverters, bird lights and aviation warning spheres are to be installed as specified in the EMP, EA conditions and or the line profile.
    - After the final rehabilitation has been completed on a property, to obtain the immediate release from the landowner.
- Environmental Management
    - Monitoring of site environmental progress in respect of time, deliverables and quality.
    - Liaison between Project Manager, SHEQ/SHE/Environmental Manage, Senior Environmental Advisor, Site Supervisor, EO, affected and interested parties, authorities and stakeholders on environmental matters.
    - Recommending Environmental Management Plan modifications to the Project/SHEQ/SHE/Environmental Manager as and when the particular site conditions warrant it.
    - Communicating changes of the Environmental Management Programme to all relevant parties.
    - Maintaining climatic data on an ECO register using Eskom/Contractor EO readings.

- Issuing Contractors Communications and Site Instructions via the Site Supervisor or delegated person as delegated by the Project Manager.
- Monitoring performance of Contractor and sub-contractors to ensure compliance with environmental and statutory requirements.
- Validating the regular site inspection reports, which are to be prepared by the CEO.
- Checking the EO's record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken.
- Checking the EO's complaints register in which all complaints are recorded, as well as actions taken.
- Assisting in the resolution of environmental related conflicts.
- Compiling and completing the environmental management related component of the handing-over documentation and any other related documents.
- Acting as Land and Rights representative for all matters of environmental management.
- Timeously identifying any sensitive site issues which may affect environmental aspects and the reporting of this to the Project/SHEQ/SHE/Environmental Manager.
- Monitoring that good housekeeping practices are followed and maintained by the Contractor.
- Monitoring that the ground rehabilitation is initiated on time, complying with the EA, EMPr and to the satisfaction of the landowner.
- Assisting the Contractor and Eskom EO with the environmental awareness training course to all site staff, targeted at the level of the workers so that they have a basic understanding of the environment that they are working in. The Contractor will provide an interpreter if needed.
- Monitoring that sensitive areas are demarcated within or alongside the construction areas i.e. sites identified in the EMP, EA. All personnel are to be informed of such sites and the reason the site is demarcated.

- Monitoring
  - Validating the site environmental monitoring plan.
  - Validating the "Punch List/daily pre-warning" and reporting all defects and non-conformances as per the Control of Nonconformity Procedure.
  - Carrying out environmental surveillances.
  - Validating and recording of certificates proving the legal disposal of waste streams.

- Reporting

- To complete a daily diary, bi-weekly and monthly (completed by the 24th of each month) reporting to Land and Rights and the Project/SHEQ/SHE/Environmental.
- Manager on the compliance of the Contractor according to the environmental authorization, environmental management plan and landowner conditions. The reports are to include photographic images of special occurrences taking place during the reporting period.
- An environmental compliance report as required by the EA or Eskom, consisting of consolidated information from the reports to be submitted to the Director of Environmental Impact Evaluation. The intervals of the report will be as per the requirement of the EA.
- To attend site meetings as required.
- To inform Land Development and Management and the Project/SHEQ/SHE/Environmental Manager of any activity that is not in accordance with the EA and respective Conditions, the Environmental Management Programme and Landowners' agreed general and special conditions or detrimental to the environment.

- Administration
  - To assure a proper site ECO administration function to cater for all environmental site related correspondence.
  - To execute your environmental responsibilities as per Eskom's Risk Management System.
  - To promote and maintain sound relationships with landowners, community, contractors and suppliers.

7.1.2 Contractor

- To provide all necessary supervision during the execution of the project. He/ She must be available on site at all times.
- To appoint a competent Contractor Environmental Officer (CEO).
- To implement the projects as per the approved project plan.
- To ensure that implementation is conducted in an environmentally acceptable manner.
- To fulfil all obligations as per the agreed contract.
- To comply with special conditions as stipulated by Landowners during the negotiation process.
- To inform and educate all employees about the environmental risks associated with the different construction activities and lessen significant impacts to the environment.
- Eskom Environmental Representative To implement and integrate environmental management systems by ensuring compliance to ISO 14001 & monitoring performance.
- Report environmental incidents.
- Provides environmental training.

- Ensures compliance with pertinent environmental legislations and other legally binding documents.

7.1.3 Authorising Department

The role of the Authority is to enforce compliance with the EA and the EMPr.

8 DESCRIPTION OF MITIGATION MEASURES

This section of the EMPr serves to prescribe mitigation measures to prevent, reduce, eliminate or compensate for impacts, to acceptable/insignificant levels.

9 PRE- CONSTRUCTION MANAGEMENT PROGRAMME

The pre-construction management programme is to be used as a guide during the planning, design and detailing of the development components. This part of the programme is to be referenced by all involved in decision making during the planning and design phases.

9.1 NEGOTIATIONS WITH AFFECTED LANDOWNERS

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• To ensure that landowners are aware of activities taking place within their properties.	Eskom will ensure that all affected landowners are negotiated with prior to construction.	Signed landowner consent forms.	Eskom	Prior commencement of construction activities

9.2 COMMISSIONING OF TENDER

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Ensure that proper environmental conditions are established prior to commencing with construction by informing all parties of appropriate environmental protection measures.	• The successful tendering contractors will be made aware of the contents of this EMPr and any penalties arising from noncompliance prior to the commencement of work. • All tendering contractors will be made aware of the audit and monitoring requirements as stipulated in this EMPr. • Appoint an Environmental Control Officer (ECO) who will be responsible to monitor compliance to the EMPr. • Inform the department of the appointment of the	• Signed Declaration by contractor. • Appointment Letter	• Eskom • Contractor	Prior commencement of construction activities

	ECO and provide the candidate's contact details.			

10 CONSTRUCTION MANAGEMENT PROGRAMME

10.1 SITE ESTABLISHMENT

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure minimal disturbance of the environment during the site establishment.	Construction camps on the site will be required to be established in appropriate locations prior to the commencement of construction, preferably within already disturbed areas. After completion of the contract, these areas have to be rehabilitated. **10.1.1 Site Plan:** Documentation for the proposed camp site must be prepared by the contractor prior to the commencement of construction activities, and must be submitted to Eskom for approval. This documentation must include, but not limited to the following: • Site access (including entry and exit points). • All material and equipment storage areas including storage areas for hazardous substances. • Construction offices and other structures. • Security requirements including temporary and permanent fencing, and lighting. • Solid waste management facilities. • Storm water control measures. • Provision of potable water and mobile chemical ablution facilities. Throughout the period of construction, the contractor	• Observation • Site Plan • Landowner agreements	ECO & Contractor CEO	Prior to site establishment

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	shall restrict all activities to within the designated areas as per the construction layout plan. Any relaxation or modification of the construction layout plan is to be approved by the ECO. **10.1.2 Site Camps:** The following restrictions or constraints shall be placed on the site camp for the construction staff in general: • The use of rivers and streams for washing of clothes. • The use of welding equipment, oxy-acetylene torches and other bare flames where veld fires constitute a hazard. • Indiscriminate disposal of rubbish or construction wastes or rubble littering of the site. • Spillage of potential pollutants, such as petroleum products. • Collection of firewood. • Poaching of any form. • Use of surrounding veld as toilets. • Burning of wastes and cleared vegetation. **10.1.3 Vegetation clearing:** • The natural vegetation encountered on the site is to be conserved and left intact as much as possible. • Only trees and shrubs directly affected by the works may be felled or cleared, provided that a permit is not requirement. **10.1.4 Water for human consumption:**			

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	Water for human consumption must be available at the site offices and at other convenient locations on site. **10.1.5 Sewage Treatment:** • Should there be no other ablution facilities available, chemical toilets must be supplied (1 per 15 persons) and must be regularly cleaned and maintained by the contractor. • The Contractor must arrange for regular emptying of toilets and will be entirely responsible for enforcing their use and for maintenance. • The ablution facilities must be at least 100m distance from the watercourses and associated buffers.			

10.2 Sensitive Ecology

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• To ensure that the sensitive area is not disturbed. • To ensure minimal or if all possible no disturbance to the vegetation on and around the site. • To ensure the control of alien invasive species and to ensure that the rehabilitation of indigenous vegetation is as close to the original state as possible.	The proposed project will encroach on non-perennial watercourses, and two listed species which are known from the area, *Hoodia gordonii* which is classified as DD (Data Deficient – Insufficient Information) and *Aloinopsis luckhoffii* which is classified as DDT (Data Deficient – Taxonomically Problematic). Aside from the listed species, a number of protected species are present at the site, including *Aloe claviflora*. Should the need to relocate protected species arise, a permit must be obtained from the relevant provincial authority (DAFF)) the Contractor must ensure that the following are in place: • Demarcate or recommend conservation / preservation measures for any identified ecologically "sensitive" and/or protected species and areas,	• Observation • ECO to monitor • Site plan	Eskom Contractor	Prior to construction

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	• Point out and/or demarcate all ecologically "sensitive" areas to the contractors (e.g. red data habitats & species, rivers, streams, wetlands, sensitive soils, steep slopes and areas susceptible to erosion). • Demarcate and create a DWS approved buffer for the area near the wetlands and consider it a no-go area. • Ensure that 'No-Go' areas are clearly demarcated and/or fenced before construction starts. Barriers are to be maintained in good order throughout the course of the construction.			

10.3 ROADS

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure minimal and or no additional disturbance of the environment as primary access roads already exist.	• An access route to the site already exists. The contractor must make use of existing routes at all times. • Access roads will be maintained by the Contractor. The Contractor will erect and maintain marker pegs along the boundaries of the working areas, access roads, haul roads or paths before commencing any other work. If proved insufficient for control, these will be replaced by fencing with the additional cost being borne by the Contractor. • Ensure that access roads to the site are of a suitable quality to eliminate soil erosion and channel storm water • All existing farm roads (private roads) damaged during the construction phase, should at the end of construction be repaired to the satisfaction of the landowner, as per the	• Use of designated access roads • No complaints from the landowners • No destruction of or • damage to known archaeological sites	• Contractor • ECO • CEO	• On-going during the construction phase

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	conditions of the written contractual agreement between the landowner and the contractor. • Upon completion of the construction, the Contractor will ensure that the access roads are returned to a state no worse than prior to construction commencing.			

10.4 Materials Handling, Use And Storage

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• To ensure safe handling, storage use and disposal of hazardous substances. • To ensure full compliance with the requirements of the applicable legislation.	The contractor's management and maintenance of plant and machinery will be strictly monitored according to the criteria given below: **10.4.1 Safety:** • All the necessary handling and safety equipment required for the safe use of hydrocarbons shall be provided by the contractor to be used and/or worn by the staff. The contractor must comply with the Occupational Health and Safety Act (Act 85 of 1993) and Construction Regulations, 2003 as this governs what the contractor must do/provide for his staff. **10.4.2 Hazardous Material Storage:** • Hydrocarbons and hazardous substances shall only be stored under controlled conditions. • All hazardous materials will be stored in a secured,	• Observation • Incident Report	ECO & Contractor CEO	Continuous throughout the construction phase

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	designated area with restricted entry. • Storage of hazardous products shall only be in suitable containers. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure as well as Material Safety Data Sheets (MSDS). **10.4.3 Fuels and Gas Storage:** • Fuel must be stored in a steel tank supplied and maintained by the Contractor according to safety procedures. • The Contractor shall ensure that diesel is stored in appropriate storage tanks or in bowsers. • The tanks/ bowsers shall be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be 110% of the total capacity of all the storage tanks/ bowsers. • Gas welding cylinders and LPG cylinders must be stored in a secure, well-ventilated area. The contractor must supply sufficient fire fighting equipment in event of an accident and strictly no smoking will be allowed where fuel is stored and used.			

10.5 EMPr Training

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• To ensure that all site personnel have basic level of environmental awareness training.	• The CEO shall arrange for Environmental Awareness Training programs for the personnel on site and the team with the contents of this EMPr, either in written format or verbally. • Daily took box talks shall be undertaken everyday by the Contractor EO.	• Signed training attendance Register • Declaration of good conduct signed by all site personnel	CEO & Contractor	• Prior construction and to continue throughout construction through toolbox talks.

10.6 Water Supply

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• To ensure availability of water for various uses as and when required. • To ensure that water usage is minimised. • To conserve water resources at all times. • To encourage a 3R (Reduce, Reuse, Recycle)	• The source of water will be the current supply to the existing substation. • The client/ECO shall point out to Contractors where they can obtain water for construction purposes (e.g. water for dust suppression as well as for drinking). Contractors shall not make use of/collect water from any other source than those allocated to them as suitable for use.	Water meter reading records	ECO & Contractor	Ongoing during the construction phase

10.7 Vehicular Access And Movement Of Construction Vehicles

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Damage to protected /endangered vegetation. • Damage to sensitive areas. • Erosion and loss of topsoil.	• To prevent ecological damage. • Minimise damage to the identified watercourses • Minimise erosion of embankments and subsequent siltation of watercourses	• CARA • NEMBA • NWA	• A physical access plan along the servitude shall be compiled and the Contractor shall adhere to this plan at all times to ensure access to all towers sites. • No illegal use of private roads during construction due to damage anticipated as a result of heavy vehicles and equipment. • Upon completion of the project all roads shall be repaired to their original state. • No roads shall be cut through river- and stream banks as this may lead to erosion causing siltation of streams. • Soil stabilisation measures must be implemented especially on steep slopes. • Rehabilitation of disturbed areas immediately following construction.	• Access plan approved by the ECO • No complaints from residents and landowners • No access roads through wetlands • No visible erosion scars once construction is completed • Erosion is not evident on slopes.	• Photographic record of private roads prior to the Contractor using the roads. Site plan • Regular monitoring of access roads conditions • Monitoring of impacts into the surrounding areas	ECO & Contractor CEO	Continuous during the construction phase

10.8 Movement Of Construction Personnel And Equipment

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Impact on sensitive environs. • Trespassing • Safety and security.	• To ensure controlled and manageable movement of personnel and equipment.	• TRMPV ACV2 REV1	• The Contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times. • Ensure that access to the site, including related infrastructure and machinery is restricted to authorised personnel only. • Where construction personnel and/or equipment wish to move outside the boundaries of the site, the contractor/ labourers must obtain permission from the CEO in consultation with the ECO. • All equipment moved onto site or off site during a project is subject to the legal requirements as well as Eskom specifications for the transport of such equipment. The Contractor shall meet these safety requirements under all circumstances. • All equipment transported shall be clearly labelled as to their potential hazards according to specifications.	• No trespassing of contractor's workforce. • No complaints from landowners	• Observation • Security registers. • Complaints register	ECO & Contractor	Continuous throughout the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			• All the required safety labelling on the containers and trucks used shall be in place. • The Contractor shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident and shall supply a method statement to that effect. • The contractor is to ensure that no machinery, personnel, material, or equipment enters 'No-Go' areas during the course of the project				

10.9 VEGETATION

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Damage to protected/endangered vegetation • Damage to topsoil	• To conserve flora. • To ensure the control of alien invasive species and to ensure	• NEMBA • CARA	Some of the towers will be in proximity to sensitive environs. A number of protected species are present at the site, including *Aloe claviflora* • The natural vegetation encountered on the site is to be conserved and left intact as much as possible.	• No alien species • No disturbance of protected flora	• Observation • Complaints register	• ECO & • Contractor • CEO	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	that rehabilitation is as close as possible to the original state		• Only vegetation directly affected by the works may be felled or cleared. • Demarcate the construction footprint. • No open fires are permitted within naturally vegetated areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction /earthworks in that area (DWAF, 2005). • Bush clearing in the servitude or around the substation must be in accordance to Eskom Vegetation Management Guideline (Reference – TGL41-334); and	• Minimal disturbance of vegetation including crops			

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			• No bush clearing to be undertaken without the knowledge thereof by the property owner. It is recommended that the owner is informed of the basic construction process during initial interaction so that he is aware of the vegetation clearing that will occur. • Only manual removal of weed will be permitted on site. Chemical and mechanical (Tlb, bulldozer) control is not allowed on site. • Implement an alien invasive plant monitoring and management plan whereby the spread of alien and invasive plant species into the areas disturbed by the construction of the power are regularly removed and re-infestation monitored.				

10.10 PROTECTION OF FAUNA AND AVIFAUNA

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Damage to habitat • Negative impact on bird due to electrocution and faulting • Negative impact on animal life.	• To conserve animal life. • To make sure that impact on natural vegetation is kept to the very minimum in order to conserve suitable habitats as much as possible. • To prevent degradation of suitable sensitive fauna habitats. • To prevent contamination	• NEMBA	Considering the loss of natural habitat in the area and the fragmentation of the remaining areas, the towers could potentially lead to the increased loss and fragmentation of fauna habitat. • An Eskom approved bird friendly pole design must be used. • Under no circumstances shall any animals (Stock or game) be handled, killed or be interfered with by the Contractor, his employees, his subcontractors or his subcontractors' employees. • No hunting of fauna and avifauna shall be tolerated by the contractor or his personnel on the site. The Contractor and his employees shall not bring any domesticated animals onto the site. • The Contractor shall keep the site clean and tidy from rubbish that	• No reported faunal injuries • No complaints from landowners	• Observation • Complaints register that records complaints from landowners • Daily inspection	• ECO & • Contractor • CEO	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	of water within the nearby watercourse thereby preserving several amphibian species. • To ensure that impact on sensitive fauna species area kept to a minimum • To ensure that ecological linkages are maintained along the power line route. • To prevent		can attract animals. • Fauna rescue and relocation programme must be implemented. • Any open excavations must be inspected early morning prior to the daily construction activities. Any amphibians and small mammals or any other fauna species found must be removed and released in suitable habitats away from construction activities. The open excavations must be back-filled as soon as possible • Records of any injured or deaths of fauna within the construction servitude must be kept by the ECO. • Construction must be restricted to daylight hours to prevent any disturbance such as floodlights. • Pesticides that are environmentally friendly should be used if necessary. • To mitigate for collision, it is				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	injury or death of fauna species as a result of falling into open excavations • To prevent collision of birds with power lines • To prevent electrical faulting		recommended that the earth wires be fitted with the best available (at the time of construction) Eskom approved anti bird collision line marking device. • All towers close to water must be fitted with the standard Eskom Bird Guards as per Eskom Transmission guidelines.				

10.11 HERITAGE AND/OR ARCHAEOLOGICAL SITES

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Destruction of sites of archaeological and heritage	• To preserve any heritage, cultural or archaeological sites that	• NHRA	• Stone tools have been identified along the route; therefore no stone robbing or removal of any material is allowed.	• Any finds are immediately reported to a suitably qualified	• Intermittent observation.	• ECO & • Contractor • CEO • Archaeologist	On-going during all excavations

significance. • Loss of historic cultural landscape. • Loss of intangible heritage value due to change in land use.	might be encountered during the construction phase. • Protection of known sites against destruction, vandalism and theft. • Preservation and appropriate management of any new archaeological sites should this be discovered during construction.		• All identified archaeological material shall be barricaded and marked as no go for the duration of the construction phase. • If any archaeological material (e.g. fossils, bones, artefacts etc.) is found during excavation, the contractor shall stop work immediately and inform the Construction Manager. • The Contractor shall not recommence working in that area until written permission has been received from the SAHRA. • Under no circumstances may any heritage material be destroyed or removed from site. Further until the necessary approval has been obtained from SAHRA. • Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as no go zone by use of proper barricading and access thereto must be denied.	archaeologist for further investigation. • No destruction of or damage to known archaeological sites • Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologist • No litigation due to destruction of sites			

10.12 SERVICING AND RE-FUELLING OF CONSTRUCTION EQUIPMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Impact on soil and water resources due to accidental spillages.	• To conserve soils, surface and ground water. • To prevent spillages of hazardous substances	• NEMWA • NWA • OHSA	• All maintenance and repair work will be carried out within an area designated for this purpose, equipped with necessary pollution containment measures. • The Contractor may only change oil or lubricant at agreed and designated locations, except during emergency repair, following which any accidental spillages will be cleaned up / removed immediately. • Refuelling, greasing or oiling of vehicle and construction machinery must be done on a drip tray or bunded surface. • In such instances the Contractor must ensure that drip trays are available to collect any oil or pollutants. Drip trays will also be placed under vehicles and machinery that are stationary for more than 24hours.	• No evidence of hazardous substances polluting the site.	• On-going monitoring with regular inspections; and • Service Records.	• ECO & • Contractor • CEO	On-going during the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			• Construction vehicles are to be maintained in an acceptable state of repair. No vehicles or equipment with leaks or causing spills will be permitted to operate at any of the construction sites. • All leaking equipment's must be repaired immediately offsite and emergency repairs must be done on protected ground. • Fuels required during construction must be stored in a central depot at the construction camp. • This storage area must be located on a slab and be contained within a bund capable of containing at least 110% of the total volume in the containers. • Temporary fuel storage tanks and transfer areas also need to be located on an adequately bunded surface to contain accidental spillages. • Appropriate run-off containment measures must be put in place.				

10.13 WASTE MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Visual Impact • Water resources	• To ensure the efficient management of waste on site • To ensure minimal impact on the surrounding environment • . Minimise waste material being strewn in the environment	• NEMWA	**10.13.1 SOLID WASTE MANAGEMENT** • Effort must be made to separate waste at source (e.g. containers for glass, paper, metals, plastic, organic waste and hazardous waste). • An adequate number of scavenger proof refuse bins must be provided at the construction site and must be clearly labelled (general or hazardous) or according to waste streams • The Contractor will ensure that all personnel deposit waste in the waste bins provided. • All waste must be transported in an appropriate manner (e.g. plastic rubbish bags) and disposed of at a licensed waste disposal site. Proof of safe disposal must be kept on site. • The Contactor may not dispose of any waste and / or construction debris by burning, or burying. • Waste bins must be emptied	• Presence of proper storage facilities that are properly labelled. • Post-construction work areas are clear of all waste materials.	• Intermittent Observation • Waste Disposal Records	• ECO & • Contractor • CEO	Daily

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			regularly (minimum weekly) such that they do not overfill. • Discard all construction waste at a licenced waste management facility / landfill site. The Contractor will maintain 'good housekeeping' practices and ensure that all work sites and construction camp are kept tidy and litter free. **10.13.2 LIQUID WASTE MANAGEMENT** • An adequate number of suitable containers with lids must be provided at the construction site. • The Contractor will ensure that all personnel discharge waste water in the drums provided. • All waste must be transported in an appropriate manner and disposed of at a licensed waste disposal site.				

10.14 SURFACE AND GROUNDWATER MANAGEMENT

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Possible contamination of water resources.	• To conserve all natural water resources • To ensure effective water management in order to prevent incorrect diversions of water which result in soil erosion and storm water run-off with negative environmental impacts. • To ensure that the rivers and streams are protected and incur minimal negative impact from the development.	NWA	• The Contractor must take reasonable precautions to prevent the pollution of the ground and water resources on and adjacent to the site as a result of his activities. • No natural watercourse is to be used for the cleaning of tools or any other apparatus. This includes for purposes of bathing, or the washing of clothes etc. • No spills may be hosed down into a storm water drain or sewer, or into the surrounding natural environment. • All soil contaminated, for example by leaking machines, refuelling spills etc. is to be excavated to the depth of contaminant penetration, placed in suitable drums/containers and	• No water wastage	• Observation • Design Plans	• Contractor • ECO • CEO	Continuous through the construction phase.

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			removed to a hazardous waste facility. • No extraction of water from any natural resources without the relevant authorisation. • Storm water management measures must be as per the Storm water Management plan. • Erosion control on temporary access roads must be undertaken. • Any physical damage to any aspect of a watercourse must be prohibited. Minimise the extent of any damage to flood plains that is necessary to complete the works, and will not pollute any river as a result of construction.				

10.15 SENSITIVE AREAS (WATER COURSES AND BUFFERS)

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Changing the quantity and fluctuation properties of the watercourse. • Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount) • Alteration of water quality toxic contaminants (including toxic metal ions (e.g. copper, lead,	• To preserve and conserve the sensitive environment .	NWA	Non-perennial streams and/or drainage channels were identified within the immediate vicinity of the proposed power line. • Construction in and around watercourses must be preferably restricted to the dryer months. • Vehicular access through watercourses must be prohibited (unless a GA/WUL is in place). Only pedestrian access must be allowed. • Cordon-off areas that are under rehabilitation as no-go areas accordingly. If necessary, these areas should be cordoned off to prevent vehicular, pedestrian and livestock access. • Runoff from roads must be managed to avoid erosion and pollution problems. • Demarcate the watercourses and buffer zones to limit disturbance and clearly mark these areas as no-go areas.	• Undisturbed sensitive environments and/or properly rehabilitated. • Compliance with the WUL conditions	• Observation • WUL	• CEO • ECO • Contractor	Throughout the construction and post construction to ensure proper rehabilitation.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
zinc) and hydrocarbons. • Changing the physical structure within a water resource.							

10.16 HAZARDOUS MATERIALS

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Impact on soils and water resources	• To ensure safe and proper handling of hazardous material	• HSA	• The Contractor must comply with all National, Regional and Local legislation with regard to the storage, transport, use and disposal of petroleum, chemical, harmful and hazardous substances and materials. • The Contractor will furthermore be responsible for the training and education of all personnel on site who will be handling the material about its proper use, handling and disposal. • Storage of all hazardous material is to be safe, tamper proof and under strict	• No incidents reported	• Hazardous material data sheet • Incident reports • Observation of spillages and leakages	• ECO & • Contractor • CEO	Continuous throughout the construction phase

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			control. • Exercise extreme care with the handling of diesel and other toxic solvents to ensure that spillage is avoided. • Any accidental chemical / fuel spills must be remediated immediately.				

10.17 OIL SPILL MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Impact on soils and water resources	• To avoid ground and surface water contamination • To ensure proper and safe handling of oil spillages.	• HSA	• The contractor must prevent potential hydrocarbon spills during construction. • Hydrocarbon must be stored in properly contained areas so as to minimize accidental spillage. • No hazardous or toxic chemicals or substances must be stored where there could be accidental leakage into subterranean water supplies. • Use of drip trays under stationary vehicles. All spills must be reported to the ECO within 24 hours of the spill via a	• No incident reported • Proper use of drip trays • Presence of oil spill kit	• Observation • Incident report	• ECO • Contractor • CEO	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			flash report. • The contractor must be in possession of a mobile oil spill kit at all times. • The oil spill clean-up and rehabilitation standard need to be implemented.				

10.18 STORM WATER MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Possible negative impact on water resources	• To reduce the potential impact from runoff on sensitive areas.	• NWA	• The Contractor must ensure that rainwater pollutants from construction activities does not run-off into natural areas and thus result in a pollution threat. • Storm water shall be diverted from the construction works. • Increased runoff due to vegetation clearance and/or soil compaction must be managed and steps must be taken to ensure that storm water does not lead to excessive levels of silt entering the watercourses. • Necessary storm water control	• No evidence of erosion • No evidence of increased siltation	• Site Plan • Observation	• ECO • Contractor • CEO	Continuous during the construction

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			mechanisms shall be employed to ensure the sustainability of all the structures. • Effort shall be made to ensure that storm water leaving the construction site is not contaminated by any substance, whether solid, liquid or gas.				

10.19 FIRE

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Destruction of property • Loss of life	• To prevent open fires. • To ensure that the workforce is aware of emergency procedures should an incident occur	• NEMA •	• A fire Management Plan must be put in place by the Contractor and Transnet. Landowners must be consulted in order to incorporate their specific fire fighting measures. • All the necessary precautions to ensure that fires are not started as a result of activities on site must be put in place. • Fuels or chemicals must be stored at the designated storage area. • Gas and liquid fuels may not be stored in the same storage area. • All fire control mechanisms (fire fighting equipment) will be routinely inspected. Such mechanisms will be present and	• No reported fir incidents • No loss of life • No traces of cigarettes buts outside the designated smoking area.	• Fire Management Plan • Daily checks	• ECO • Contractor • CEO	On-going during the construction phase

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			accessible at all times. • No open fires for heating or cooking will be permitted on site, unless otherwise agreed and then only on designated areas. • All staff on site will be made aware of general fire prevention and control methods and the name of the responsible person to alert to the presence of a fire. • Designated smoking areas must be provided, with special bins for discarding of cigarette stump. • Fire must be reported immediately.				

10.20 AIR POLLUTION

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Dust nuisance from excavations, vegetation clearing and dirt roads.	• To ensure proper mitigation of air pollution • To avoid dust nuisance from	• NEMAQA	The potential air pollutants would be dust emanating from excavation activities and access roads; emissions or exhaust fumes from faulty plant or equipment. In the event that excessive dust arises from any construction activities: • Appropriate dust suppression measures or temporary stabilising mechanisms will be used when dust generation is unavoidable (e.g. adherence to speed limit, chemical soil binders, straw, brush	• No complaints from surrounding land owners recorded.	• Observation • Complaints register	• ECO • Contractor • CEO	On-going throughout the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	excavation activities and vehicles on dirt roads		packs chipping), particularly during prolonged periods of dry weather. • Removal of vegetation will be avoided until such time as soil stripping is required. • No burning of waste material, such as vegetation from any clearing operations is allowed; • Drive at 40km/hr. on the access road in order to minimise or avoid dust pollution.				

10.21 NOISE

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Noise during excavation/ drilling of foundations and associated activities	• To ensure minimal noise disturbance • To ensure proper mitigation of noise. • To avoid noise nuisance	• ECA	• Machinery and vehicles are to be maintained in good working order. • Offending machinery and vehicles will be banned from use on site until they have been repaired. • The project team must endeavour to keep noise generating activities associated with construction activities to a minimum and within working hours. • Where possible the contractor must use equipment which falls within the	• No complaints from surrounding land owners recorded.	• Noise monitoring • A register of complaints to be kept on site at all times and kept up to date.	• Contractor • ECO • CEO	On-going during the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	from operating construction equipment.		allowable noise limits. • Any complaints pertaining to noise must be recorded and reported to the ECO and addressed accordingly. • Labourers to be provided with hearing protection as and when required.				

10.22 VISUAL

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Loss of sense of place.	• To ensure proper mitigation of potential visual impacts. • To maintain the site's aesthetics.	• NEMA	• Storage facilities and other temporary structures on site must be located such that they have as little visual impact on local residents as possible. • Soil excavated (if any) must not be stockpiled above 2m. • All temporary structures erected on site for the purposes of the project's construction phase will be removed from site upon completion of the project. • Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas.	• Clean and tidy site. • No complaints from the landowners and affected parties.	• Observation • Complaints register	ECO & Contractor CEO	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			• The site must be clean and tidy at all times.				

10.23 EXCAVATION, BACKFILLING AND TRENCHING

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Possible erosion • Injury of animal life	• To prevent erosion. • To ensure safety for both human and animals.	• OHSA	While working at areas prone to erosion the following must be adhered to: • Excavations must not be left open for longer than 30 days where at all possible • Excavations must be barricaded/ fenced of at all times.	• No incidence of animals trapped in trenches reported	• Observation • Incident report	• Contractor / • ECO • CEO	On-going excavations

10.24 AGRICULTURAL ACTIVITIES

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Negative impacts on agricultural activities as a result of maintenance	• To limit the impact on agricultural	CARA	• Maintain good relations with landowners. • Consult farmers prior to any clearing activities. • Avoid unnecessary destruction of crops by remaining within the servitude at all	• No encroachment into agricultural crops • No negative feedback from	• Observation • Complaints register	• ECO • CEO • Contractor	During and after maintenance procedures

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
procedures, servitude clearing	activities		times. • No form of disturbance of agricultural stock will be permitted for whatever reason.	landowners			

10.25 EROSION AND CONTROL

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Impact on soils and habitats and sensitive environs.	• To prevent erosion and sedimentation.	• NWA • NEMA • CARA	To prevent any form of erosion the following must be adhered to: • During construction, the Contractor will protect areas susceptible to erosion by installing necessary temporary and / or permanent drainage works as soon as possible and by taking suitable measures to prevent surface water concentration into nearby roadways. • Prior to construction, all topsoil must be stripped and stockpiled separately from subsoil and rocky material. Soil must be stripped in a phased manner so as to retain vegetation cover for as long as possible.	• No visible signs of erosion.	• Observation • Complaints register	• Contractor • ECO • CEO	On-going particularly during excavations

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			• Stockpiled topsoil must not be compacted and must be replaced as the final soil layer. • Stockpiled soil must be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet/windy season. • Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil. • Soil must not be stockpiled on drainage lines or near watercourses • The timing of clearing and grubbing must be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. • If topsoil will be stockpiled for a longer period, it must be either vegetated with indigenous grasses or covered with a suitable material to prevent erosion and invasion by weeds. • To limit the introduction of alien species				

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			into the area, no soil may be imported onto site. • Where required, cut-off trenches can be installed to divert substantial run-off and prevent erosion as and when necessary. • Sensitive areas such as watercourses (wetlands, pans, and riparian areas) must be cordoned off so that vehicles and construction personnel cannot gain access to these areas. • Where access cannot be avoided into sensitive areas, the amount of vehicle and personnel traffic must be kept to a minimum and should make use of only one route.				

10.26 USE OF CEMENT AND CONCRETE

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Soil pollution.	• To conserve soils, surface	• NEMA • NEMWA • HSA	The contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment due to their high pH and the chemicals contained therein. To	• Areas of construction are clear of all concrete	• Observation • Site Plan	• Contractor • ECO • CEO	Throughout the construction phase

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	and groundwater. • To minimise waste concrete from polluting the environment		avoid ground pollution the following must be adhered to: • Pre-mix concrete shall be the preferred option where possible. • The batching / mixing area must be properly designated and indicated on the site plan and it will be kept neat and clean at all times. • No batching / mixing activities will occur on a permeable surface. • Unused cement bags will be stored appropriately so as not to be affected by rain / runoff. • The visible remains of the batch plant and concrete, either solid, or from washings shall be physically removed immediately and disposed of appropriately at a licensed landfill site if not reused.	residue/waste following construction.			

10.27 Site Clean-Up And Rehabilitation

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• Erosion • Wrong seeding	• Minimise damage to topsoil and environment at tower positions • Successful rehabilitation of all damaged areas • Prevention of erosion. • To ensure that the site is fully rehabilitated to its original state. • To ensure that the site is clean and neat. • Minimize claims and litigation from landowners	• NEMBA • NEMA	• The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. • Fully rehabilitate (e.g. clear and clean area, rake, pack branches etc.) all disturbed areas and protect them from erosion. • All replaced equipment and excess gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work. • No discarded materials of any nature shall be buried on the site or on any other land within the site. • Re-seeding shall be done on disturbed areas as directed by the CEO and ECO. • Slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. • The Contractor shall dispose of all excess material on site in an appropriate manner and at a designated place.	• No loss of topsoil due to construction activities • No loss of topsoil due to construction activities • All disturbed areas successfully rehabilitated within three months of completion of the contract • No visible erosion scars three months after completion of the contract • No open fires	• Rehabilitation Plan • Observation	ECO CEO Contractor	On completion of construction Random surveys by landowner

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
				shall be allowed on site under any circumstance • No evidence of rubble or litter left on site. • Successful completion of the contract with all landowners signing the release form six months after completion of the project.			

10.28 MONITORING OF EMPR COMPLIANCE

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• To implement an on-going monitoring and performance audit programme.	• The correct and successful implementation of impact mitigation measures in order to reduce adverse impacts on environmental conditions needs to be ensured by a proper monitoring program. • Monitoring of the general implementation of/adherence to the EMPr shall be the responsibility of the ECO. • Reporting on adherence/compliance to stipulations as communicated to contractors, shall take place during scheduled site meetings.	• Observation • Audit Reports	• ECO & • Contractor • CEO	On-going during the site establishment and construction. phase.

10.29 DOCUMENT CONTROL

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
• To ensure compliance with the requirements of the regulatory authority • To assign roles and responsibilities to ensure compliance • To implement and comply	• A copy of the EMPr and the EA will be made available on site at all times. • The EMPr as well as the EA will be used for referral as the project progresses. The EA will also be presented to the authorities at any random time that they might visit the site.	• Availability of an EMPR copy on site	• ECO & • Contractor • CEO	On-going during the construction phase.

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
with the requirements of the EMPr.				

11 SUMMARY OF LAND OWNER DETAILS AND CONDITIONS

All contact with the Landowners shall be courteous at all times. The rights of the Landowners shall be respected at all times and all staff shall be sensitised to the effect on the works undertaken on private property. Eskom shall ensure that all agreements reached with the Landowner are fulfilled, and that such areas be rehabilitated once construction is completed.

Land owner special conditions are attached as Appendix F.

12 GENERIC CONDITIONS

In order to ensure compliance with Eskom's environmental policy as well as environmental legislation requirements, the following generic conditions are applicable:

12.1 SITE DOCUMENTATION/MONITORING

The standard Eskom site documentation shall be used to keep records on site. All documents shall be kept on site and be available for monitoring and auditing purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legitimate. Regular monitoring of all site works by the Environmental Control Officer is imperative to ensure that all problems encountered are solved punctually and amicably. When the Environmental Control Officer is not available, the Contract Manager/Site Supervisor shall keep abreast of all works to ensure no problems arise.

Monthly reports shall be forwarded to the appointed Land Development Environmental Advisor with all information relating to environmental matters. The following Key Performance Indicators must be reported on a two-weekly basis:

- Complaints received from Landowners and actions taken.
- Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
- Incidents possibly leading to litigation and legal contraventions.
- Environmental damage that needs rehabilitation measures to be taken.
- The following documentation shall be kept on site:
- Access negotiations and physical access plan.
- Complaints register.
- Site daily dairy.
- Records of all remediation / rehabilitation activities.
- Copies of monthly reports to the Tx Engineering Environmental Advisor at MWP.

- Copy of the EMPr.

12.2 AUDITS

During the construction period at least monthly Environmental Audits shall be conducted to determine compliance with the recommendations of the EMPr and conditions of the EA. These can be internal audits or external audits by DEA or the ISO14001 auditors.

The appointed ECO, as well as the contractors on site, are responsible for ensuring compliance with the EMPr. It is recommended that periodic EMPr compliance reports (audits) are compiled by the ECO and submitted to the Eskom Environmental Advisor for review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the DEA. Interested and Affected Parties (Landowners) must be allowed access to the EMPr document should they so wish. They have the right to monitor specific aspects of the EMPr in conjunction with the ECO and Contractor in a reasonable and informal manner, without unreasonably disrupting construction activities.

12.3 SOCIO-CULTURAL ISSUES

- A plan of action must be drawn up in the case of an emergency (veld fire, damaged power line, vegetation problems etc.). Eskom contact names and telephone numbers must be available on site;
- Property owners or occupiers must be treated with respect and courtesy at all times;
- The culture and lifestyles of the communities living in close proximity to the substation must be respected;
- Removal of agricultural products is prohibited. Receipts must be obtained for any merchandise purchased or received from landowners;
- Vehicles must be driven carefully in hazardous road conditions (sharp bends, narrow roads, bad weather, children playing on or near the road, domestic animals on or near the road etc.). Vehicle movement must be kept to a minimum during rain to avoid damage to the access road;
- Environmental clauses (as referred to in this EMPr) must be included into contract documents for all contractors;
- Tribal graves, archaeological sites and sites of historical interest in close proximity to the substation are to be treated with respect and protected.
- No firewood is to be collected except with the written consent of the landowner; and
- A register must be maintained of all complaints or queries received as well as action taken.

13 FAILURE TO COMPLY WITH THE ENVIRONMENTAL CONSIDERATIONS

The ECO will, acting reasonably, have the authority to order the Contractor to suspend part or all of the works if the he causes unacceptable damage to the environment by not adhering to the specifications set out below. The suspension will be enforced

until such time as the offending parties' actions, procedures and/or equipment are corrected and adequate mitigation measures implemented.

14 AMENDMENT OF EMPR

Any issue that may arise during the construction or operational phase of the development and that is not provided for in this EMPr may be addressed as an addendum to this EMPr. An addendum will be submitted to the client for approval prior to the implementation of the provisions contained and communicated to the Authorities.

15 TOWER SPECIFIC MANAGEMENT MEASURES

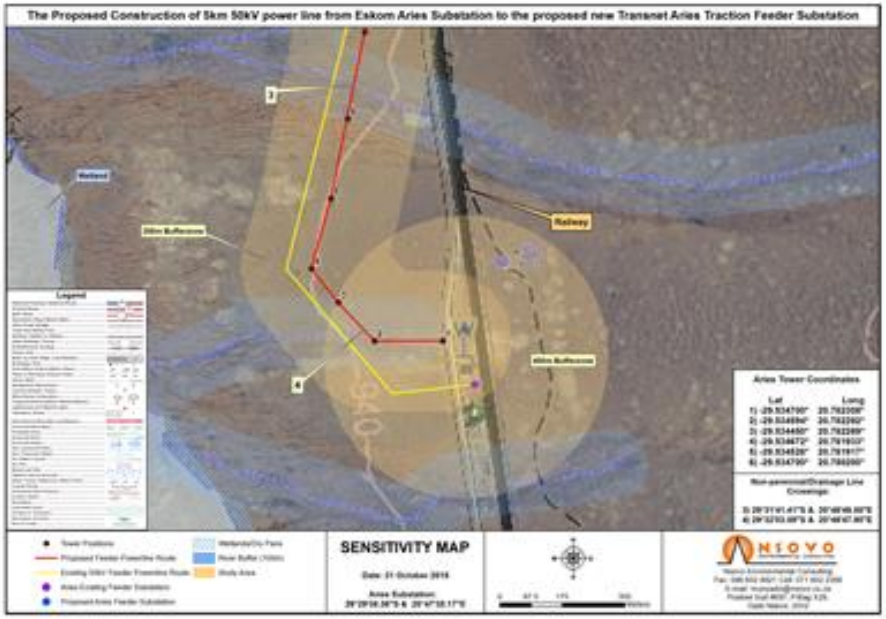
This section outlines tower specific management measures that need to be taken into consideration. This has been compiled with input from specialist who walked the site to identify sensitivities. The details of the specialists are as follows:

Table 4: Specialist contact details

Specialist study	Company	Contact person	Contact details
Archaeological study	Vhubvo-Archaeo-Heritage Consultants	Munyadziwa Magoma	Cell: 082 535 6855 E-mail: munyadziwa@vhubvo.co.za
Vegetation specialist	Simon Todd Consulting	Simon Todd	Cell: 082 332 6502 Email: Simon.Todd@3foxes.co.za
Wetland Delineation	Sazi Environmental Consulting	Nonkanyiso Zungu	Cell: 084 8000 187 Tel: 011 312 4582 Email: NZungu@sazienvironmental.co.za

Table 1: Tower Specific Management Plan for Towers 1, 2, 3 and 4

Tower Number	1	**Coordinates**	-29.534700°	20.782308°
	2		-29.534594°	20.782292°
	3		-29.534450°	20.782269°
	4		-29.534672°	20.781933°



Tower Specific Management Plan

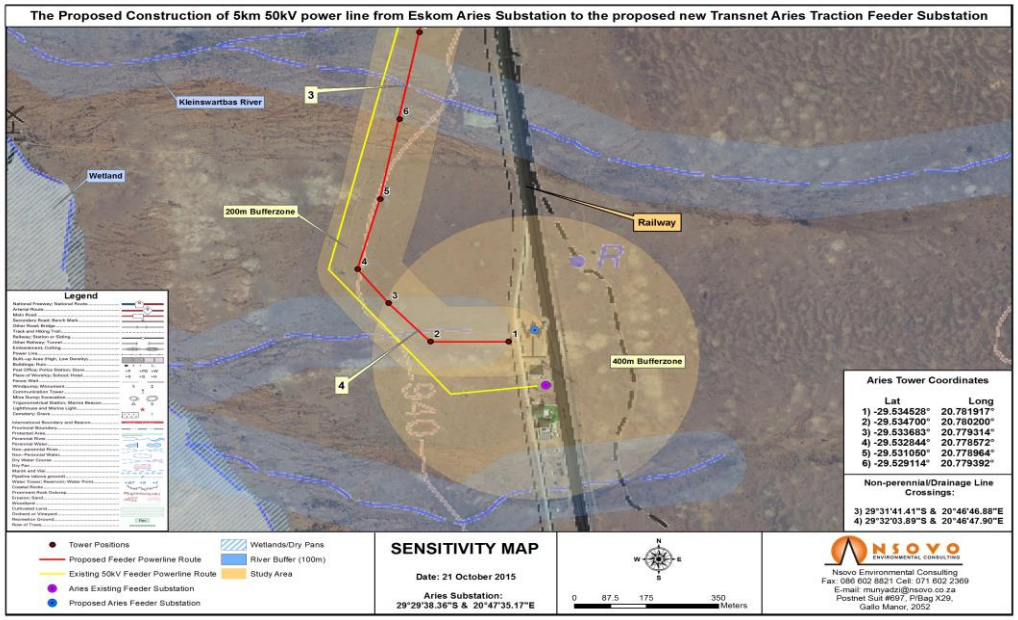
Specialist	**Recommendations**
Vegetation	*Hoodia gordonii* was noted between Tower 1 & 2 and Tower 4. It is however highly unlikely that these would need to be translocate for the construction of the power line. The potentially affected individuals must be marked with construction barrier tape or similar prior to construction to ensure that they are visible and can be avoided during construction. Should there be a need for relocation a permit will be required.
Heritage	Number (s) 1, 2 3 and 4 are for the area were the traction feeder is proposed. The sites are disturbed, and currently used for storing construction materials. As a result, the area is colonised of bolster amongst others. General conditions apply.
Hydrology	Tower 1 to 4 is located within 500m of a non-perennial stream. General Conditions apply. WUL required.

Tower 1

Tower 3

Table 2: Tower Specific Management Measure for Towers 5 and 6.

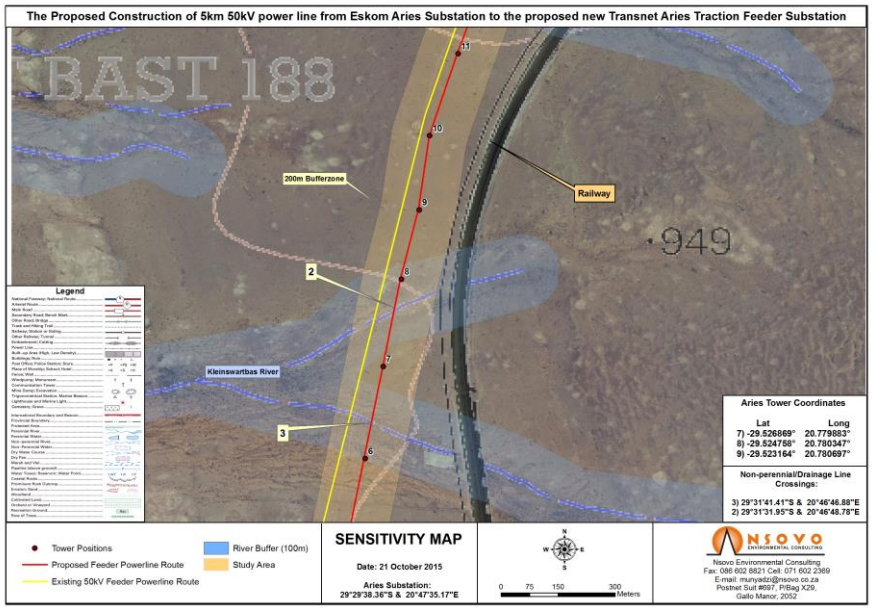
Tower Number	5	**Coordinates**	-29.534528°	20.781917°
	6		-29.534700°	20.780200°



Tower Specific Management Measure	
Specialist	**Recommendations**
Vegetation	*Hoodia gordonii* was noted next to Tower 6. It is however highly unlikely that these would need to be translocated for the construction of the power line. The potentially affected individuals must be marked with construction barrier tape or similar prior to construction to ensure that they are visible and can be avoided during construction. Permit should be obtained should there be a need to relocate protected species.
Heritage	These towers are proposed on a fairly steep section of land which is reasonably next to the fence and close to the main gravel road. General conditions apply.
Hydrology	Tower 5 is located within 500m of a non-perennial stream and Tower 6 Crosses a non-perennial stream. WUL required.

Table 3: Tower Specific Management Measure for Towers 7 and 8

Tower Number	7	**Coordinates**	-29.533683°	20.779314°
	8		-29.532844°	20.778572°



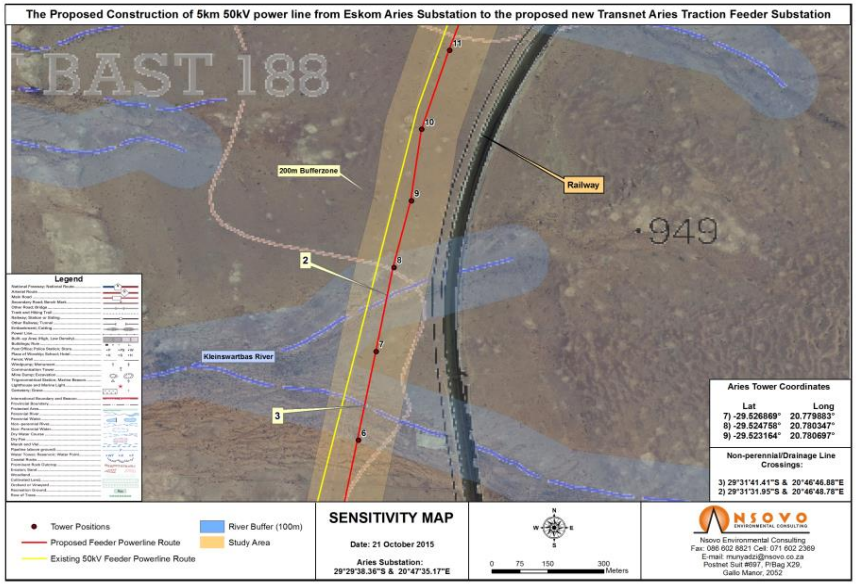
Tower Specific Management Measure

Specialist	**Recommendations**
Vegetation	*Aloe claviflora* was noted at Tower 8. It is however highly unlikely that these would need to be translocated for the construction of the power line. The potentially affected individuals must be marked with construction barrier tape or similar prior to construction to ensure that they are visible and can be avoided during construction.
Heritage	Some recent concrete were also noted in some section, it would appears this was dumped from somewhere. General Conditions apply.
Hydrology	Tower 7 and 8 Crosses a non-perennial stream. WUL required.

Tower 7	Tower 8

Table 4: Tower Specific Management Measure for Tower 9

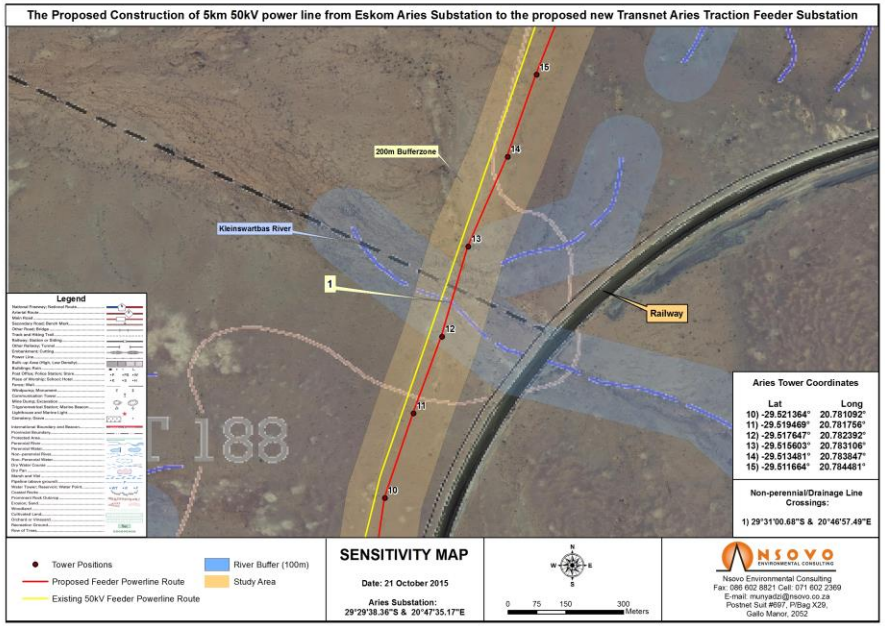
Tower Number	9	**Coordinates**	-29.531050°	20.778964°



Tower Specific Management Measure	
Specialist	**Recommendations**
Vegetation	No protected or listed species were noted at Tower 9. Generic conditions apply.
Heritage	The proposed area is flat and sand throughout. Generic Conditions apply.
Hydrology	Tower 9 is located within 500m of a non-perennial stream. WUL required

Table 5: Tower Specific Management Measure for Towers 10, 11 and 12

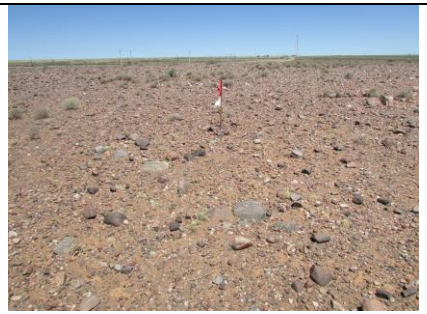
Tower Number	10	**Coordinates**	-29.529114°	20.779392°
	11		-29.526869°	20.779883°
	12		-29.524758°	20.780347°



Tower Specific Management Measure

Specialist	**Recommendations**
Vegetation	*Aloe claviflora* was noted between Tower 11 and 12. It is however highly unlikely that these would need to be translocated for the construction of the power line. The potentially affected individuals must be marked with construction barrier tape or similar prior to construction to ensure that they are visible and can be avoided during construction. No permit required.
Heritage	The proposed area (s) is fairly steep and located on a section of land which is part of a non-perennial stream. As a result, the area is eroded, and most of the materials that are there have possibly been moved from the road by agent of erosion. General conditions apply.
Hydrology	Tower 10 is not located close to a watercourse; Tower 11 is located within 500m of a non-perennial stream and Tower 12 Crosses a non-perennial stream. WUL required.

Tower 10

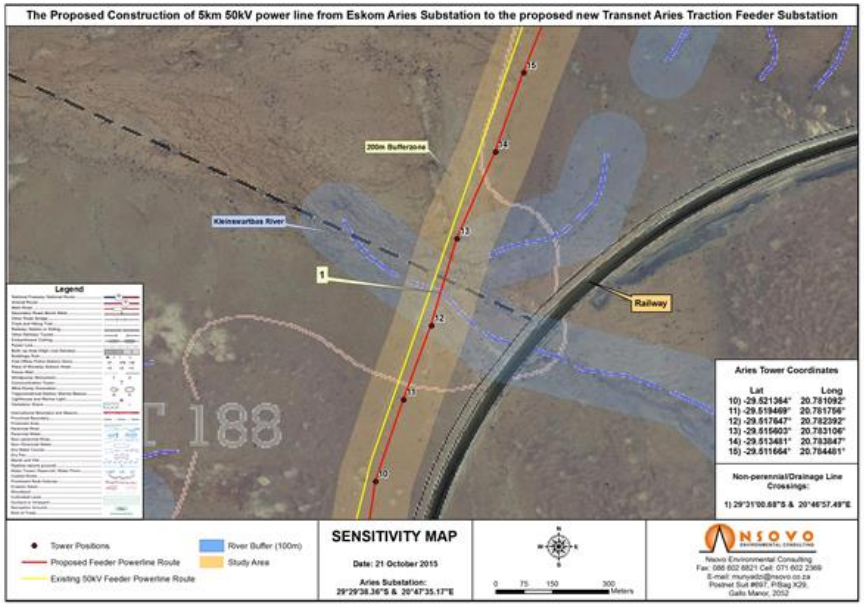


Tower 11

Tower 12

Table 6: Tower Specific Management Measure for Tower 13

Tower Number	13	**Coordinates**	-29.523164°	20.780697°

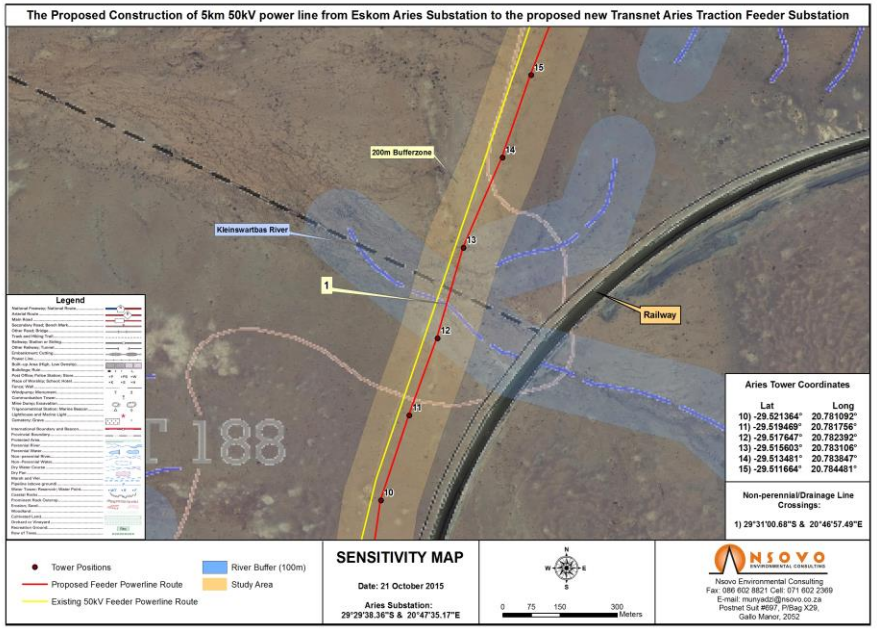


Tower Specific Management Measure	
Specialist	**Recommendations**
Vegetation	*Hoodia gordonii* was noted next to Tower 13. It is however highly unlikely that these would need to be translocated for the construction of the power line. The potentially affected individuals must be marked with construction barrier tape or similar prior to construction to ensure that they are visible and can be avoided during construction. Permit must be obtained should there be a need to relocate protected species.
Heritage	Phase 2 archaeological mitigation of the site is recommended. In addition, a destruction permit must be sought to destroy the site.
Hydrology	Tower 13 is located within 500m of a non-perennial stream. WUL required.

Tower 13

Table 7: Tower Specific Management Measure for Tower 14

Tower Number	14	**Coordinates**	-29.521364°	20.781092°



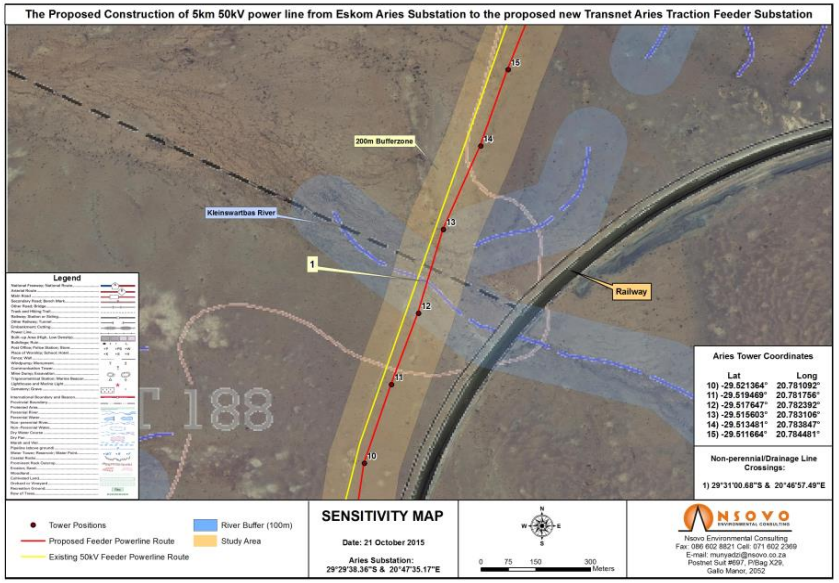
Tower Specific Management Measures

Specialist	**Recommendations**
Vegetation	*Hoodia gordonii* was noted in Tower 14. It is however highly unlikely that these would need to be translocated for the construction of the power line. The potentially affected individuals must be marked with construction barrier tape or similar prior to construction to ensure that they are visible and can be avoided during construction. However, should the need to relocate such species arise, a permit must be obtained from the relevant authority.
Heritage	Archaeological monitoring during the first construction stage is recommended. Should significant material be exposed, further mitigation work may be required.
Hydrology	Tower 14 is located within 500m of a non-perennial stream. WUL required.

Tower 14

Table 8: Tower Specific Management Measure Plan for Tower 15

Tower Number	15	**Coordinates**	-29.519469°	20.781756°



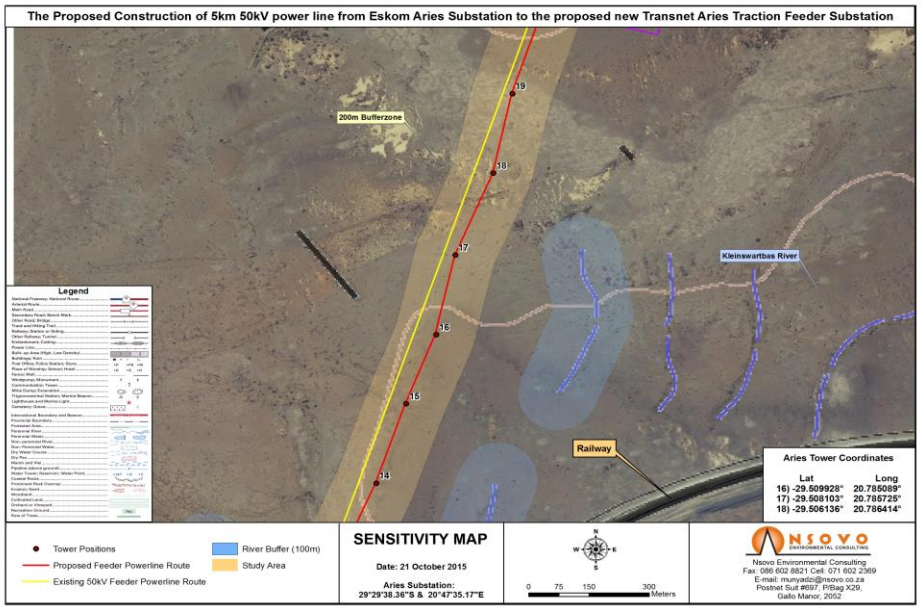
Tower Specific Management Measure

Specialist	**Recommendations**
Vegetation	No protected or listed species were noted at Tower 15.
Heritage	This tower is proposed on a fairly even area which is concentrated of pebbles. There is some fairly low and isolated vegetation cover.
Hydrology	Tower 15 is not affected by any watercourse.

Tower 15

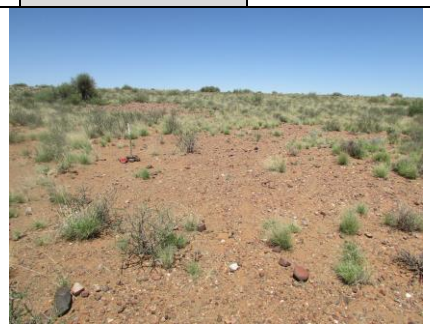
Table 9: Tower Specific Management Measures for Towers 16, 17 and 18

Tower Number	16	**Coordinates**	-29.517647°	20.782392°
	17		-29.515603°	20.783106°
	18		-29.513481°	20.783847°

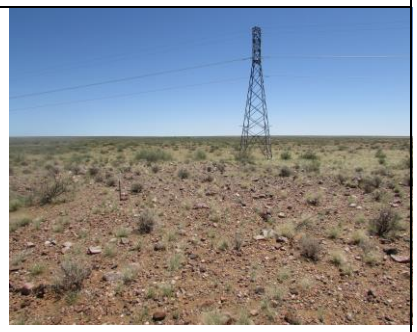


Tower Specific Management Measure	
Specialist	**Recommendations**
Vegetation	No protected or listed species were noted at Towers 16, 17 and 18.
Heritage	Tower 18 - Phase 2 archaeological mitigation of the site is recommended. In addition, a destruction permit must be sought to destroy the site.
Hydrology	Tower 16, 17 and 18 are not located close to watercourse.

Tower 16



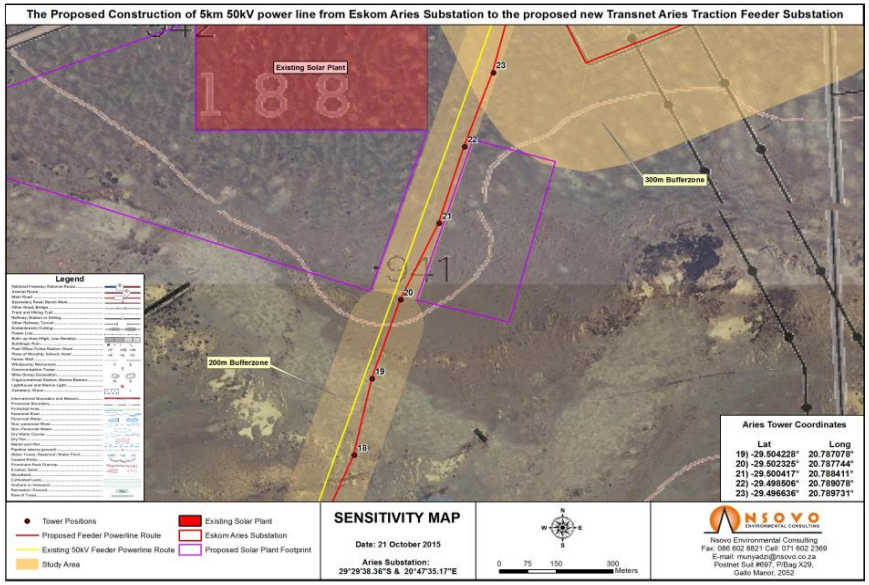
Tower 17



Tower 18

Table 10: Tower Specific Management Plan for Tower 19

Tower Number	19	**Coordinates**	-29.511664°	20.784481°

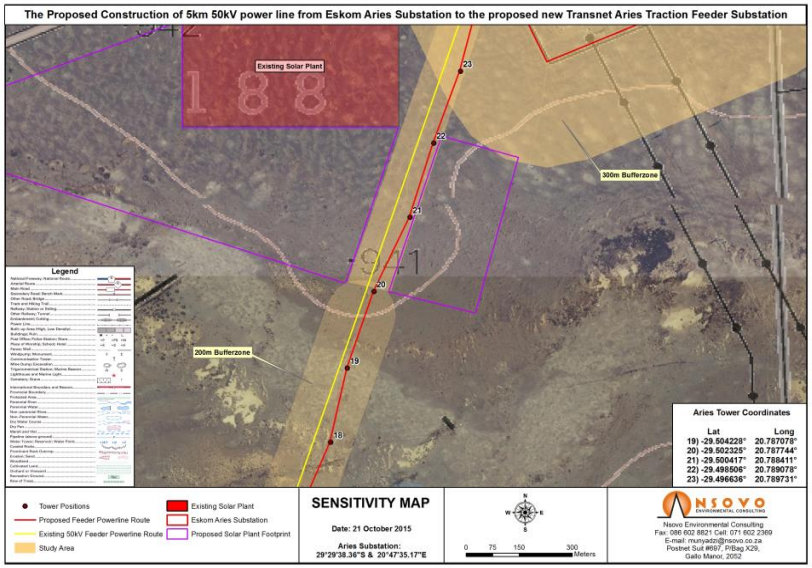


Tower Specific Management Plan	
Specialist	**Recommendations**
Vegetation	No protected or listed species were noted at Tower 19.
Heritage	An archaeological monitoring must be undertaken during construction of Tower 19, to ensure that no negative impact result on the noted sites. In addition, Eskom must take note of the site and its position and ensure that no negative impact take place during construction.
Hydrology	Tower 19 is not close to a watercourse

Tower 19

Table 11: Tower Specific Management Plan for Tower 20

Tower Number	20	**Coordinates**	-29.509928°	20.785089°



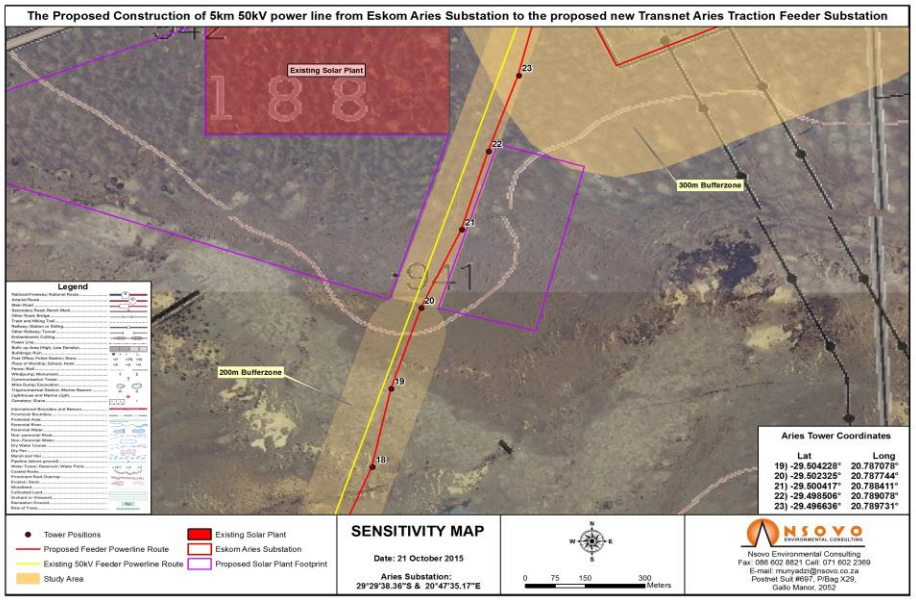
Tower Specific Management Plan

Specialist	**Recommendations**
Vegetation	No protected or listed species were noted at Tower 20.
Heritage	The proposed area is generally rocky and located on a non-perennial stream. As a result, erosion has taken place, exposing stone materials which are abundant. An archaeological monitoring must be undertaken during construction of Tower 20, to ensure that no negative impact result on the noted sites. In addition, Eskom must take note of the site and its position and ensure that no negative impact take place during construction.
Hydrology	Tower 20 is not affected by a watercourse.

Tower 20

Table 12: Tower Specific Management Plan for Towers 21, 22 and 23

Tower Number	21	**Coordinates**	-29.508103°	20.785725°
	22		-29.506136°	20.786414°
	23		-29.504228°	20.787078°



Tower Specific Management Plan	
Specialist	**Recommendations**
Vegetation	No protected or listed species were noted at Towers 21, 22 and 23.
Heritage	There are abundant of stones, especially on tower number 21 and 22 which slightly rises as compared to that proposed for tower 23. General conditions apply.
Hydrology	Tower 21, 22 and 23 are not close to a watercourse.

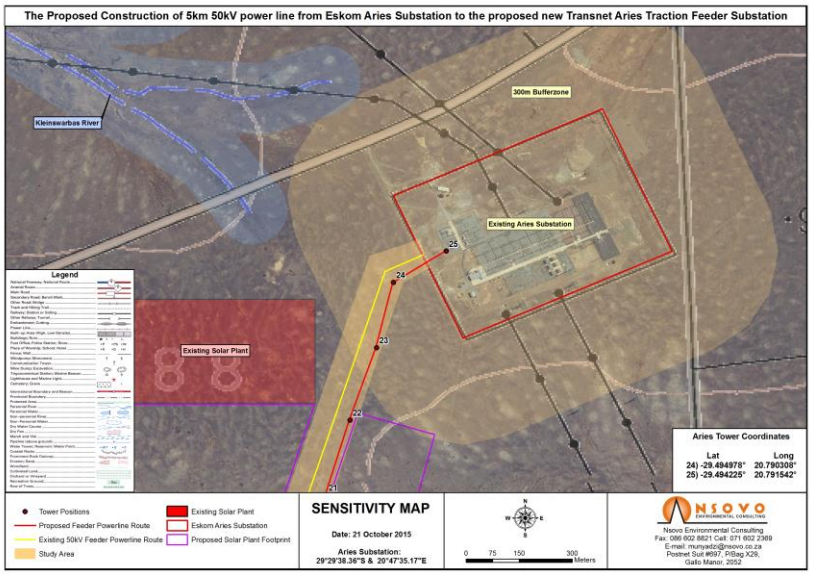
Tower 21

Tower 22

Tower 23

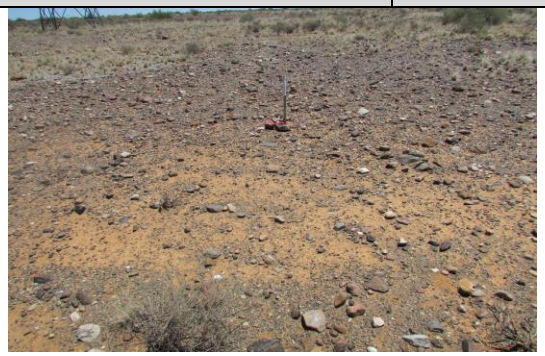
Table 13: Tower Specific Management Plan for Towers 24 and 25

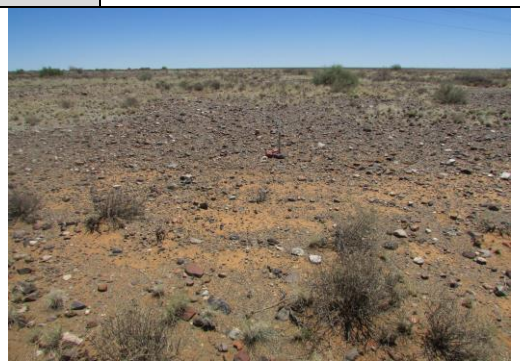
Tower Number	24	**Coordinates**	-29.502325°	20.787744°
	25		-29.500417°	20.788411°



Tower Specific Management Plan	
Specialist	**Recommendations**
Vegetation	No protected or listed species were noted at Towers 24 and 25.
Heritage	These areas are generally disturbed by activities related to construction of nearby existing towers. As a result, remnant of old construction materials are scattered throughout. Although some isolated stone tools were noted, these are out of context and in very low density. Monitoring during construction of tower no. 25 to determine if whether the density of these isolated tools are consistently low, or not.
Hydrology	Tower 24 and 25 are not close to a watercourse.

Tower 24





Tower 25

15.1 VEGETATION MAP

The vegetation Map below depicts protected plants that were identified on site during the walk down. It is however highly unlikely that these would need to be translocate for the construction of the power line. Nonetheless, should a need arise to relocate such species; a permit must be obtained from the relevant authority. The potentially affected individuals must be marked with construction barrier tape or similar prior to construction to ensure that they are visible and can be avoided during construction.

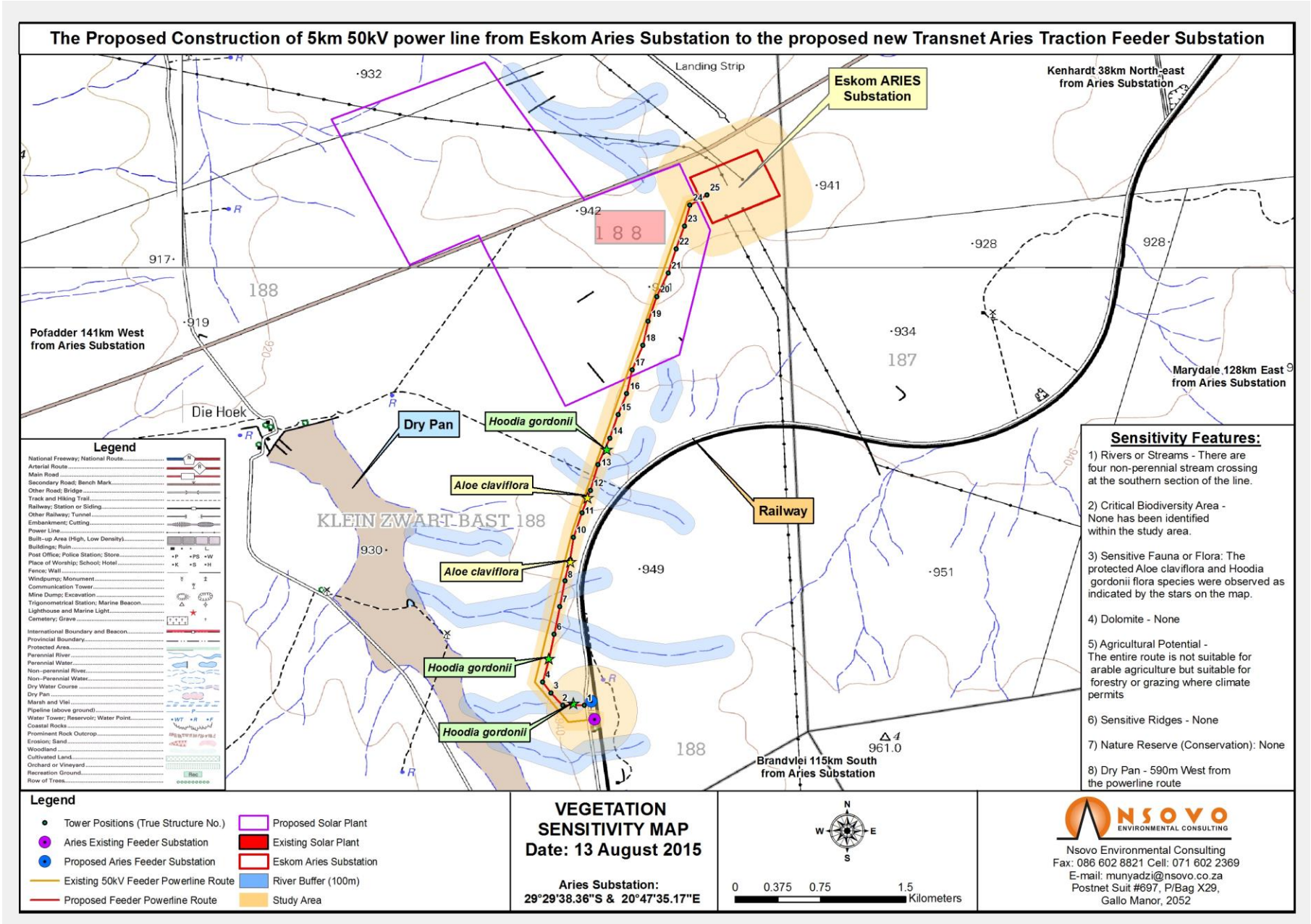


Figure 2: Vegetation Map depicting sensitive vegetation on site.