

**ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED CONSTRUCTION OF THE STEVE BIKO 132KV SUBSTATION AND ASSOCIATED LOOP-IN AND LOOP-OUT LINES**

**DEA REF NO: 14/12/16/3/3/1/1335**

JUNE 2015

Prepared For:



Prepared by:

**JEFFARES & GREEN (PTY) LTD**

PO Box 1109

Sunninghill

2157

Telephone: 011 231 2200

Email: jgijhb@jgi.co.za

Project director: Cecilia Canahai

|  |  |
| --- | --- |
| **VERIFICATION PAGE** | Form 4.3.1 |
|  |
| Rev 13 |
| TITLE : Environmental Management Plan for the proposed construction of the Steve Biko 132kV Substation and associated loop-in and loop-out lines. |
| **JGI NO. :** | **DATE :** | **REPORT STATUS :** |
| 3695 | 24/06/2015 | Draft EMP |
| **CARRIED OUT BY :**Jeffares & Green (Pty) LtdP O Box 1109Sunninghill2175Tel (011) 2312200*Fax (011) 8071607*Email canahaic@jgi.co.za | **COMMISSIONED BY :**Eskom Distribution, Gauteng Operating UnitP.O. Box 36099Menlo ParkPretoria0102Tel: 012 484 5141Fax : 086 667 3961 E-mail: marecc@eskom.co.za |
| **AUTHOR :** | **CLIENT CONTACT PERSON :** |
| Mrs Sonja van der Merwe | Mrs Charmaine Mare |
| **SYNOPSIS :** |
| Environmental Management Plan for the Steve Biko 132/11KV substation and two 132KV powerlines & associated infrastructure |
| **KEY WORDS :** |
| Environmental Management Plan. |
| **© COPYRIGHT:** Jeffares & Green (Pty) Ltd. |
| **QUALITY VERIFICATION** |
| This report has been prepared under the controls established by a quality management system that meets the requirements of ISO9001: 2008 which has been independently certified by DEKRA Certification under certificate number 90906882 |   |
| **Verification** | **Capacity** | **Name** | **Signature** | **Date** |
| By Author | Senior Environmental Scientist | Sonja van der Merwe |   | 24/06/2015 |
| Checked by | Technical Director  | Cecilia Canahai |   | 24/06/2015 |
| Authorised by | Technical Director  | Cecilia Canahai |   | 24/06/2015 |

ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED CONSTRUCTION OF THE STEVE BIKO 132KV SUBSTATION AND ASSOCIATED LOOP-IN AND LOOP-OUT LINES

DEA REF NO: 14/12/16/3/3/1/1335

TABLE OF CONTENTS

[1 INTRODUCTION 7](#_Toc422724836)

[2 PROJECT NEED AND DESIRABILITY 8](#_Toc422724837)

[3 PROJECT ENVIRONMENTAL ASSESSMENT PRACTITIONER 8](#_Toc422724838)

[3.1 About Jeffares & Green (Pty) Ltd 8](#_Toc422724839)

[4 PROJECT TEAM 9](#_Toc422724840)

[4.1 Experience of Project Team 10](#_Toc422724841)

[5 PURPOSE OF THE EMP 11](#_Toc422724842)

[6 ABBREVIATIONS 12](#_Toc422724843)

[7 ROLES AND RESPONSIBILITIES 12](#_Toc422724844)

[7.1 Role of the Environmental Control Officer (ECO) 12](#_Toc422724845)

[7.2 Role of the Engineer 13](#_Toc422724846)

[7.3 Role of the Contractor 13](#_Toc422724847)

[7.4 Roles of Eskom 13](#_Toc422724848)

[7.5 Roles of the CNC Supervisor During the Operational Phase 14](#_Toc422724849)

[7.6 Roles of Line and Servitude Manager During the Operational Phase 14](#_Toc422724850)

[8 STANDARD ESKOM DOCUMENTS TO BE COMPLIED WITH 14](#_Toc422724851)

[9 RELEVANT LEGISLATION TO BE COMPLIED WITH 15](#_Toc422724852)

[10 SPECIALIST STUDIES 15](#_Toc422724853)

[11 SUBSTATION AND POWERLINE PRE-CONSTRUCTION PHASE 16](#_Toc422724854)

[11.1 Final Site Layout and Design Planning 16](#_Toc422724855)

[11.2 Pre-Site Establishment Requirements 16](#_Toc422724856)

[11.3 Demarcation and Establishment of Temporary Infrastructure 17](#_Toc422724857)

[11.4 Access and Haulage Routes 20](#_Toc422724858)

[11.5 Routing of Services 20](#_Toc422724859)

[11.6 Vegetation Clearance, Animal and Habitat Disturbance 21](#_Toc422724860)

[11.7 Waste Management 23](#_Toc422724861)

[11.8 Landowner Consultation 24](#_Toc422724862)

[11.9 Visual Impacts 24](#_Toc422724863)

[11.10 Heritage Impacts 25](#_Toc422724864)

[11.11 Safety and Security 25](#_Toc422724865)

[12 SUBSTATION AND POWERLINE CONSTRUCTION PHASE 26](#_Toc422724866)

[12.1 Stormwater Management 26](#_Toc422724867)

[12.2 Surface and Groundwater Pollution Prevention 26](#_Toc422724868)

[12.3 Vegetation Clearance, Animal and Habitat Disturbance 27](#_Toc422724869)

[12.4 Material Laydown Area 28](#_Toc422724870)

[12.5 Use of Chemical Toilets 28](#_Toc422724871)

[12.6 Worker Conduct 29](#_Toc422724872)

[12.7 Waste Management, Hygiene and Cleanliness 29](#_Toc422724873)

[12.8 Materials Delivery and Transportation 31](#_Toc422724874)

[12.9 Management of Materials Storage Area – Including Hazardous and Dangerous Substances 31](#_Toc422724875)

[12.10 Refuelling of Plant 32](#_Toc422724876)

[12.11 Using Materials – Non Hazardous, Hazardous and Dangerous Goods 33](#_Toc422724877)

[12.12 Air Quality Management / Soil Management 33](#_Toc422724878)

[12.13 Stormwater Management 35](#_Toc422724879)

[12.14 Rivers and Streams 35](#_Toc422724880)

[12.15 Wetlands 37](#_Toc422724881)

[12.16 Noise Impacts 40](#_Toc422724882)

[12.17 Heritage Impacts 41](#_Toc422724883)

[12.18 Occupation Health and Safety 41](#_Toc422724884)

[13 SUBSTATION AND POWERLINE OPERATIONS 43](#_Toc422724885)

[13.1 Site Hand Over 43](#_Toc422724886)

[13.1.1 Take over works 43](#_Toc422724887)

[13.2 Access Control, Access Roads, Access Gates, Fences and Security 43](#_Toc422724888)

[13.2.1 Gate Control 43](#_Toc422724889)

[13.2.2 Access Control and Security 43](#_Toc422724890)

[13.2.3 Access Roads 44](#_Toc422724891)

[13.2.4 Fences 44](#_Toc422724892)

[13.2.5 Access Control, Gates and Fencing, and Restriction of Activities on Private Land 44](#_Toc422724893)

[13.2.6 Access Control, Gates and Fencing, and Restriction of Activities on Private Land 44](#_Toc422724894)

[13.3 Notification of Intent to Visit Land 45](#_Toc422724895)

[13.3.1 Notification of Intent to Visit Land 45](#_Toc422724896)

[13.3.2 Unplanned/unscheduled visits 47](#_Toc422724897)

[13.4 Identification of Visitors and Vehicles 48](#_Toc422724898)

[13.4.1 Identification of Visitors 48](#_Toc422724899)

[13.4.2 Identification of Vehicles 48](#_Toc422724900)

[13.4.3 Eskom Contractor Identification 48](#_Toc422724901)

[13.5 Compensation Due to Damage to Property 48](#_Toc422724902)

[13.6 General Maintenance 49](#_Toc422724903)

[13.6.1 Maintenance 49](#_Toc422724904)

[13.7 Operational Phase Vehicle Traffic and Machinery 49](#_Toc422724905)

[13.7.1 Heavy Machinery 49](#_Toc422724906)

[13.8 Insulator Oil Spillage and Storage 50](#_Toc422724907)

[As per Eskom’s Standard Oil Spill Clean-Up and Rehabilitation Plan (ESKASABT0), November 2003 50](#_Toc422724908)

[13.8.1 Insulator Oil Spillage and Storage 50](#_Toc422724909)

[13.9 Operations and Maintenance of Oil Containment Structures, Oil Traps and Oil Dams 53](#_Toc422724910)

[13.9.1 Oil Containment structures 53](#_Toc422724911)

[13.10 Soil Erosion Prevention 54](#_Toc422724912)

[13.11 Waste Management 55](#_Toc422724913)

[13.11.1 Daily on-site waste management activities and waste management during maintenance activities. 55](#_Toc422724914)

[13.12 Management of Vegetation within the Eskom Servitude 58](#_Toc422724915)

[13.12.1 Vegetation Management 58](#_Toc422724916)

[13.13 Bush Clearing Requirements for the Maintenance of Existing Powerline Servitudes 62](#_Toc422724917)

[13.13.1 Centre line for proposed powerline 62](#_Toc422724918)

[13.13.2 Tower Position and support/stay-wire position 62](#_Toc422724919)

[13.13.3 Indigenous vegetation within servitude area (outside of the maximum 8m strip) 62](#_Toc422724920)

[13.13.4 Alien Species (Declared weeds ito CARA Reg 229 within servitude area (outside of the maximum 8m strip) 63](#_Toc422724921)

[13.14 Herbicide Use 63](#_Toc422724922)

[13.14.1 Use of Herbicide 63](#_Toc422724923)

[13.15 Biodiversity (Fauna and Flora) and Vegetation Monitoring 64](#_Toc422724924)

[13.15.1 Avifauna Monitoring 64](#_Toc422724925)

[13.15.2 Vegetation Monitoring 64](#_Toc422724926)

[13.15.3 Biodiversity 65](#_Toc422724927)

[13.16 Heritage 66](#_Toc422724928)

[13.16.1 Heritage 66](#_Toc422724929)

[13.17 Fire prevention 66](#_Toc422724930)

[13.17.1 Fire prevention 66](#_Toc422724931)

# INTRODUCTION

It is the intention of Eskom Distributions Gauteng Operating Unit to construct a new 132kV Distribution Substation, and associated loop-in and loop-out lines. This substation will be known as the Steve Biko Substation. The study area is situated east of the Marokolong Settlement, in the Hammaskraal area. It is situated within Ward 73 of the City of Tshwane Local Municipality, in the Gauteng Province. Three alternative sites for substation construction have been identified which were assessed during the Basic Assessment Process. Details of the three alternative sites are provided in the table below. Refer to Figure 1 below, as well as the project locality maps, attached to Appendix A of the Basic Assessment Report.

|  |
| --- |
| **Property Description** |
| Site Alternative 1 (Preferred Alternative) | Portion 26 of the Farm Klipdrift 90 JR |
| Site Alternative 2 | Portion 25 of the Farm Klipdrift 90 JR |
| Site Alternative 3 | Remainder of the Farm Kwalata 201 JR |



**Figure 1: Google Earth Locality Map**

This Construction and Environmental Management Plan (EMP) is compiled in fulfilment of the Environmental Authorisation Process being undertaken for this proposed project.

# PROJECT NEED AND DESIRABILITY

Due to the expected growth of the Kekana Gardens Township, the load forecast for the existing Babelegi 132/22kV transformers indicates that the substation will run out of firm capacity by 2019. The back feeding of the Temba 1-Papatso and Temba 1-Magalies is also poor. The Steve Biko substation is to be established in order to deload the Babelegi 132/22kV substation, as well as to split the feeders out of Babelegi 132/22kV to provide better back feeding and network flexibility. Opportunistically, the Pelly-Klipdrift feeder will also be split from the Steve Biko substation.

# PROJECT ENVIRONMENTAL ASSESSMENT PRACTITIONER

Jeffares and Green (Pty) Ltd was appointed by Eskom to undertake a Basic Environmental Assessment process for this proposed project.

## About Jeffares & Green (Pty) Ltd

Jeffares & Green (Pty) Ltd (J&G) is a specialist consultancy firm, offering services in the following sectors, amongst others:

* Environmental impact and environmental management;
* Geotechnical engineering;
* Geohydrology;
* Waste management; and
* Various engineering sectors (roads, structures municipal, etc).

In September 2000, J&G obtained the international quality management certification, ISO 9001, for all of its services. Our accreditation company is DEKRA.

J&G is one of the longest established consulting engineering practices in South Africa, with more than 90 years of engineering and environmental consultancy experience since its founding. J&G is a **Level 2 BBBEE** company partly owned by black professionals who are registered civil engineers, technologists, Institutional & Social Development (ISD) and training consultants. The company BEE information is attached to the Tender Document in Appendix E. The company has offices throughout South Africa and employs a staff of approximately 300.

J&G possesses a fundamental understanding of civil engineering construction methodologies and practices and hence will apply this knowledge by assisting the Employer to develop the appropriate project design from an environmental perspective.

A fundamental requirement for performance as a subservice is the demand for independence. The definition of independent given in the EIA regulations shall apply. J&G has no interest in the contract (other than a commercial one directly flowing from the subservice contract itself) and will sign as such if appointed at contract commencement and at all subsequent times of environmental management input.

J&G is familiar with the statutory requirements of the Occupational Health and Safety Act (85 of 1993) and the latest published version of the accompanying Construction Regulations as they will apply whenever the EAP enters the project site.

# PROJECT TEAM

The details of the relevant Environmental Assessment Practitioners responsible for the compilation of the EMP are provided below:

|  |  |
| --- | --- |
| **Company Name:** | Jeffares & Green (Pty) Ltd |
| **Authors:** | Mrs S van der Merwe (Senior Environmental Scientist)  |
| **Reviewed by:** | Mrs S van der Merwe (Senior Environmental Scientist) |
| **Authorised by:** | Mrs C Canahai (Technical Director) |
| **Address:** | PO Box 1109Sunning hill |
| **Tel:** | 011 231 2200 |
| **Fax:** | 011 807 1607 |
| **E-mail:** | vandermerwes@gji.co.za |

Relevant Expertise of the Independent Environmental Assessment Practitioners is provided in the table below.

## Experience of Project Team

| **Name** | **Position in Firm** | **Qualification** | **Years’ Experience** | **Experience** |
| --- | --- | --- | --- | --- |
| Mrs Cecilia Canahai | Technical Director / Engineering Geologist | Pr Sci Nat, MSC (Eng Geology), BSc (Eng Geology | 26 Year | Cecilia is a Technical Director with over 23 years of experience of which 13 as an Environmental Assessment Practitioner. Cecilia is a member of the International Association for Impact Assessment (IAIA) and the South African Institute for Environmental and Engineering Geologists. She has experience in project management, environmental impact assessments, public participation, environmental management plans and programmes, environmental control auditing, waste management, integrated development plans and engineering geology.Cecilia is a registered Professional Natural Scientist **(Registration No 400011/00)** |
| Mrs Sonja van der Merwe (née van Eden) | Senior Environmental Scientist | BA (Hons) Geography and Environmental Management | 10 Years | Sonja is a senior Environmental Scientist with 10 years of experience in the Environmental Consultancy Field. She has experience in project management, environmental impact assessments, basic assessments, public participation, environmental management plans and programmes, environmental control auditing, and mine closure planning and Geographic Information Systems. Sonja is a member of the International Association for Impact Assessments (IAIA). |

# PURPOSE OF THE EMP

The purpose of the Environmental Management Programme (EMP) is to ensure that the social and environmental impacts identified during the Basic Assessment process are effectively managed during construction, operation and closure phases of the proposed substation and associated infrastructure. The EMP will formulate mitigatory and management measures that should be made binding to Eskom and the Contractor, during the construction period and the defects liability period of the contract. The EMP will also show how mitigation and management measures will be scheduled.

The key objectives of the EMP will be to:

* Outline functions and responsibilities of responsible personnel.
* State standards and guidelines, which are required to be achieved in terms of environmental legislation.
* Outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project in order to minimize the extent of negative environmental impacts,
* Maximize the effect of positive environmental impacts and manage these environmental impacts appropriately.

The EMP covers information and/ or mitigation measures that will be taken into consideration to address impacts, where relevant, in respect of:

* Planning and Design
* Pre-Construction and Construction activities
* Operation; and
* Closure

The EMP is a living document which will be periodically reviewed and updated as necessary. Any amendments made must be submitted to both the Environmental Officer and the Project Manager for approval, prior to implementation.

# ABBREVIATIONS

|  |  |
| --- | --- |
| **E-PM** | Eskom Project Manager |
| **CNC** | Customer Network Centre |
| **DBU** | Distribution Business Unit |
| **SP** | Security Personal |
| **ECO** | Environmental Control Officer  |
| **RE** | Resident Engineer |
| **C** | Contractor |
| **EMP** | Environmental Management Plan  |
| **PCO** | Pest Control Officer |
| **C&OEMP** | Construction and Operation Environmental Management Plan |
| **SM** | Substation Manager |
| **LM** | Line and Servitude Manager for the grid |

# ROLES AND RESPONSIBILITIES

## Role of the Environmental Control Officer (ECO)

The Environmental Control Officer must monitor the implementation of relevant environmental legislation, conditions of the Environmental Authorisation (EA), and the Construction and Operational Environmental Management Plan (C&OEMP) for the project. It is recommended that monthly audits be undertaken during the construction phase. The Final Construction and Operational Environmental Management Plan should provide details of the ECO.

* The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the project team;
* The ECO must be proactive and have access to specialist expertise as and when required, these include botanists, ecologists etc.;
* The ECO must conduct audits on compliance to relevant environmental legislation, conditions of the EA and the EMP for the project;
* The size and sensitivity of the development, based on the EA, will determine the frequency at which the ECO will be required to conduct audits. (A minimum of a monthly site inspection should be undertaken);
* The ECO must be the liaison between the relevant authorities and the project team;
* The ECO must communicate and inform the engineers of any changes to environmental conditions as required by relevant authoritative bodies;
* The ECO must ensure that the registration and updating of all relevant EMP documentation is carried out;
* The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices;
* The ECO must handle information received from whistle blowers as confidential and must address and report these incidences to the relevant Authority as soon as possible;
* The ECO must convey the contents of this EMP to the Contractor site team (should the contractor not have its own environmental officer) and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce.

## Role of the Engineer

The role of the Engineer is to design and specify the project engineering aspects. Generally the engineer runs the works contract. The Engineer may also fulfil the role of Project Manager on the proponent’s behalf.

## Role of the Contractor

The principle contractor, hereafter known as the ‘Contractor’, is responsible for implementation and compliance with the requirements of the EMP and conditions of the EA’s, contract and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMP. The contractor is required, where specified, to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.

## Roles of Eskom

Eskom will be responsible for the implementation of the EMP as follows:

* Ensure that the EMP is effectively implemented;
* Liaise on a strategic level with authorities regarding any environmental issues as required;
* Provide the resources (human and financial) necessary to complete the required tasks in accordance with this EMP;
* Review the EMP; at least, annually (or when required) to assess its effectiveness and practicality and assess whether new environmental procedures are required;
* Ensure that the corrective actions and non-conformance issues are addressed with regards to the EMP;
* Liaise with public and community regarding any environmental complaints/issues (as required);
* Ensure that the site is operated in accordance with relevant permits/licenses, regulations and all appropriate policies; and,
* Maintain proper control of the site and determine what, if any, problems exist, or may be anticipated such as operational issues, regulatory requirements, and stakeholder issues, management of unacceptable waste streams, pollution and emergencies.

## Roles of the CNC Supervisor during the Operational Phase

The Supervisor shall:

* Be familiar with the contents of the EMP;
* Ensure that a copy of the EMP is kept at an accessible location at the site;
* Be fully conversant with the conditions of permits/licenses and authorisations relevant to the site;
* Provide environmental awareness training to the maintenance team as required;
* Inspect the site regularly for environmental issues;
* Ensure that all site staff are fully conversant with the EMP;
* Ensure that that all safety checks and procedures have been followed and applied, as well as ensure adherence to the Occupational Health and Safety Act;
* Ensure that the site access is managed and controlled; and
* Ensure good housekeeping and proper sign postage.

## Roles of Line and Servitude Manager during the Operational Phase

The Servitude Manager shall:

* Be familiar with the contents of the EMP;
* Ensure that a copy of the EMP is always accessible to ensure compliance;
* Be fully conversant with the conditions of permits/licenses and authorisations relevant to the site;
* Provide environmental awareness training to the maintenance team as required; and
* Undertake annual inspections with the maintenance team.

# STANDARD ESKOM DOCUMENTS TO BE COMPLIED WITH

In addition to the approved Environmental Management Plan, the Environmental Authorisation and other permits and licences, the operational activities at the substation should also comply with the following standard Eskom documents:

* Fire Risk Management (DST 34-132);
* Eskom Procedure for Vegetation Clearance and Maintenance within overhead Powerline Servitude and on Eskom owned Land (EPC 32-247).
* Eskom Environmental Waste Management Procedure (EPC 32 – 245)
* Eskom Environmental Liaison Committee (ELC) Performance Indicator Reporting Procedure (EPC 32 -249)
* Eskom Emergency Preparedness Procedure (DST 34 – 315)
* Guideline on Operating and Maintenance of Oil Containment Structures, Oil Traps and Oil Dams (TGL41-393);
* Oil spill clean-up and rehabilitation (ESKAGAAD7);
* Access to Farms (includes strategy on dealing with game farms) DGL 34-190

# RELEVANT LEGISLATION TO BE COMPLIED WITH

* National Environmental Management Act (Act 107 of 1998)
* Environmental Impact Assessment Regulations, 2010 & 2014
* Environment Conservation Act (Act 73 of 1989)
* National Environmental Management: Biodiversity Act (Act 10 of 2004)
* National Environmental Management: Protected Areas Act (Act 57 of 2003)
* The National Veld and Forest Act (Act 101 of 1998)
* National Forest Act (Act 84 of 1998)
* National Heritage Resources Act (Act 25 of 1999)
* National Water Act (Act 36 of 1998)
* Conservation of Agricultural Resources Act (Act 43 of 1983)
* National Environmental Management: Air Quality Act (Act No 39 of 2004)
* National Road Traffic Act (Act 83 of 1996)
* The National Environmental Management: Waste Act (Act 59 of 2008)
* Relevant Energy Sector Strategic Documents

# SPECIALIST STUDIES

The following Specialist studies were undertaken:

* A Heritage Impact Assessment was undertaken by Dr Johnny van Schalkwyk.
* A Visual Assessment was undertaken by Terratest
* A Faunal, Floral and Avifaunal Ecological and Impact Survey were undertaken by Strategic Environmental Focus (SEF);
* A Geotechnical Assessment was undertaken by Jeffares & Green (Pty) Ltd, and
* A Social Impact Assessment was undertaken by Equispectives.

These reports (as listed above) also contain additional recommendations and mitigation measures that should be considered during the construction and operational phases. The reports are titled, and are attached to Appendix D of the Draft Basic Assessment Report.

# SUBSTATION AND POWERLINE PRE-CONSTRUCTION PHASE

| **Mitigation Measures** | **Stage / Duration** | **Frequency** | **Responsibility** |
| --- | --- | --- | --- |
| Final Site Layout and Design Planning Will get back to you on this point whether we should keep it or not, await feedback from design engineer |
| * It is recommended that the substation is founded in the honeycomb ferricrete identified at Site Alternative 1 and Site Alternative 2. An Estimated Allowable Safe Bearing Pressure (EASBP) of 200 kPa may be assumed for this material.
* It is recommended that the contractor appoints a competent excavation supervisor in terms of Section 13 of the Construction Regulations 2014.
* Groundwater seepage was encountered at TP3-SA3 (in terms of the Geotechnical Assessment Report) at Site Alternative 3 and it is recommended that a comprehensive sub-surface drainage system is implemented to prevent water ingress during the construction of the substation. Groundwater seepage is not expected to be problematic at Site Alternative 1 and Site Alternative 2. A copy of the Geotechnical Assessment Report is attached to Appendix D of the Basic Assessment Report.
* Also refer to Section 11.6.
 | Pre-Construction phase | Once off | E-PM |
| Pre-Site Establishment Requirements |
| * The Environmental Management Plan (EMP) compiled during the Environmental Authorisation phase should be updated to include all conditions as contained in the Environmental Authorisation. This updated EMP may have to be submitted to DEA for approval, prior to commencement of the construction activities. The Environmental Authorisation will indicate whether the submission of the Final EMP to DEA would be required.
 | Pre-Construction phase | Once off | E-PM |
| * A Contractor (C) and Environmental Control Officer (ECO) should be appointed.
 | Pre-Construction phase | Once off | E-PM |
| * The C and Resident Engineer (RE) should be provided with copies of the EMP and the EA, and both the C and RE should familiarise themselves with the content of these documents. It is recommended that an inception meeting be held with the C, RE, Eskom Project Manager (E-PM) and the ECO prior to commencing any pre-construction activities on site.
 | Pre-Construction phase | Once off | E-PM |
| * The Final Site Layout plan should be compiled by the RE and C and should take all conditions and “no-go” areas as identified in the EMP into account.
 | Pre-Construction phase | Once off | RE & C |
| * The appointed ECO should compile an Audit Report template based on the contents of the EMP and should submit the Report to Eskom for review and approval.
 | Pre-Construction phase | Once off | ECO |
| * The ECO should provide Environmental Awareness training to the C, RE and all construction personnel prior to commencement of construction activities. Topics to be covered should include:
* What is meant by “environment”;
* Why the environment needs to be protected and conserved;
* How construction activities can impact on the environment;
* What can be done to mitigate against such impacts;
* Awareness of emergency and spills response provisions;
* Social responsibility during construction, e.g. being considerate to local residents.
* Translators are to be used where necessary. The use of pictures and real-life examples is encouraged as these tend to be more easily remembered. Use should be made of environmental awareness posters on site. Construction workers should be made aware that they are not to make excessive noise (e.g. shouting / hooting) as the site is near to residential areas. The need for a “clean site” policy also needs to be explained to the construction workers.
* The RE & C should explain more difficult / technical issues regarding construction activities and answer questions.
 | Pre-Construction phase | Once off | ECO |
| Demarcation and Establishment of Temporary Infrastructure |
| **A: Construction Camp*** + The RE and C should demarcate an area on site for the establishment of the construction camp as per the final site layout plan. The demarcated area should be fenced off. The following should apply:
	+ It should be situated in the property earmarked for the siting of the construction camp. No unauthorised properties may be used for such purposes;
	+ Location of adjacent properties should be taken into account;
	+ “No-go” or sensitive areas should be taken into account;
	+ Bins for the disposal of domestic wastes should be provided and placed at various locations;
	+ Cut and fill must be avoided where possible during the set up;
	+ Footprint to be kept to a minimum;
	+ Adequate parking must be provided for staff and visitors;
	+ Temporary storm water control measures as approved by the engineer and indicated on the final site layout plan should be implemented.
 | During layout and establishment | Once off | RE & C |
| * + The construction camp could comprise the following:
		- Temporary site office/s;
		- Ablution facilities which should include the installation of a temporary septic tank with sufficient capacity to accommodate sewage and waste water. The construction of “long drop” toilet is forbidden;Eskom uses an enviroloo
		- Designated first aid area;
		- Eating areas;
		- Storage areas;
		- A batching plant (if necessary). Water from the batching plant should drain to conservancy tank for removal from the site to a licensed disposal facility.
		- A refuelling area (if necessary). Fuel storage tanks shall be situated in a bunded area the volume of which shall be at least 110% of the volume of the largest tank The floor of the bund shall be smooth and impermeable constructed of concrete or plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The bund walls shall be formed of well-packed earth with the impermeable lining extending to the crest. The floor of the bund shall be sloped towards an oil trap or sump to enable any spilled fuel and/or fuel-soaked water to be removed. Refuelling should be undertaken on an impervious surface to protect groundwater quality. Fuel tanks must meet relevant specifications and be elevated so that leaks may be easily detected. Storage areas containing hazardous substances / materials must be clearly signed.
		- A maintenance area (if necessary).
 | During layout and establishment | Once off | RE & C |
| **B: Contractors Camp*** If temporary accommodation for construction workers will be required, the RE & C should demarcate an area as per the site layout plan where temporary accommodation could be established. This area should be fenced off and the following should apply:
	+ The contractor’s camp should be established either in the same property as the substation or in the nearby vicinity, on an approved site. All contractors will travel to site on a daily basis.
	+ Location of adjacent properties should be taken into account.
	+ “No-go” or sensitive areas should be taken into account.
	+ Cut and fill must be avoided where possible during the set up.
	+ Footprint should be kept to a minimum.
	+ Adequate parking must be provided for temporary residents.
	+ Temporary stormwater control measures as approved by the engineer and indicated on the final site layout plan should be implemented.
	+ The camp should include the following:
		- Temporary accommodation units,
		- Ablutions facilities which should include the installation of a temporary septic tank with sufficient capacity to accommodate sewage and waste water. The construction of “long drop” toilet is forbidden.
		- Toilets and washing facilities. Toilet facilities supplied by the Contractor for the workers shall occur at a maximum ratio of 1 toilet per 30 workers (preferred 1:15). Sanitation facilities shall be located within 100 m from any point of work, but not closer than 50 m to any water body {distances can be modified depending on the nature of the project}. Toilets shall be within the Contractor’s Camp and at work areas more than 50m from the Contractor’s Camp. All temporary/ portable toilets shall be secured to the ground to the satisfaction of the Engineer/ECO/EO to prevent them from toppling due to wind or any other cause. These facilities shall be maintained in a hygienic state and serviced regularly. Toilet paper shall be provided. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.
		- Facilities for the washing of dishes and clothing: Waste water from these areas should drain to a temporary septic tank with sufficient capacity to accommodate the waste water;
		- Bins for the disposal of domestic wastes should be provided and placed at various locations
 | During layout and establishment | Once off | RE & C |
| **C: Material Storage Area:*** The RE & C should demarcate an area as per the final site layout plan where a temporary materials storage area can be established, this area should be fenced off. This area must be situated within the boundaries of the construction camp. The following should apply:
	+ Choice of location must take into consideration prevailing winds, distance to water bodies and general on site topography;
	+ Necessary containment measures (sumps or oil traps) and/or bunded or the storage of hazardous materials and dangerous goods should be provided. Temporary stormwater infrastructure should be implemented to divert all stormwater away from the areas where such materials will be stored;
	+ Contractors shall submit a method statement and plans for the storage of hazardous materials and emergency procedures to the Engineer.
 | During layout and establishment | Once off | RE & C |
| **D: Storm water Infrastructure:*** During site establishment, proper temporary storm water control measures, as approved by the RE should be implemented;
 | During layout and establishment | During site set up. | RE/C |
| * Temporary cut off drains and berms may be required to capture storm water and promote infiltration.
 | During layout and establishment | During site set up. | RE/C |
| Access and Haulage Routes |  |  |  |
| Location and demarcation of access and haulage routes should include the following:* Should consider all limitations and recommendations as provided in the EMP;
* Contractor should demarcate access and haulage routes and manage and maintain these routes;
* Demarcated routes should include construction vehicle turning areas. All vehicle traffic should be restricted to demarcated access and haulage routes, and no turning may take place outside of demarcated areas;
* Route location should have minimum disturbance to residents and sensitive environmental areas;
* No other roads than the ones confirmed by the contractor shall be allowed;
* All construction materials should be delivered to site via these demarcated routes;
* Safety of the other road users should be considered at all times when using public and demarcated access and haulage routes;
 | During layout and establishment | Prior to moving onto site. | RE/ECO |
| Routing of Services |
| The location of all underground services and servitudes must be identified and confirmed if applicable. | During layout and establishment | Prior to moving onto site. | RE |
| Vegetation Clearance, Animal and Habitat Disturbance |
| * Indigenous vegetation should be retained as far as possible in the state / structure that occurs naturally on the site.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * To minimise the destruction of natural vegetation, the power line route should follow agricultural fields, fence lines and/or existing power lines and should not traverse areas containing natural vegetation or areas which have been marked as highly sensitive in this report.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * All plant species of conservation concern or species which are nationally or provincially protected, which will not be directly affected by the developments should be cordoned off as no go areas during construction. These areas which are cordoned off should however not prevent movement of indigenous fauna.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * An independent Environmental Control Officer (ECO) should be appointed to oversee all construction activities.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * All jumpers at transformers, T-offs and strain structures should be insulated.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * Only pole structures that are approved as “bird friendly” by Eskom’s ENVIROTECH Forum should be used.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * Streams and drainage lines should not be crossed perpendicularly with power lines where possible.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * Power lines should be routed alongside existing infrastructure such as existing power lines, roads, buildings, and railway lines where possible.
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| * Lines traversing open areas must be marked with anti-collision devices. Bird Flight Diverters on the earth wires must be installed as per specifications devised by the Endangered Wild Trust (EWT);
 | During layout and establishment | Prior to moving onto site. | E-PM & RE |
| No trees / shrubs / groundcover may be removed, or vegetation stripped, without the prior permission of the Engineer / ECO. | During layout and establishment | On-going. | RE/ECO |
| No vegetation may be cleared without prior permission from the Engineer. Permission / permits will be obtained from DAFF before any clearing of any indigenous trees is to be done. Trees that are not to be cleared should be marked beforehand with danger tape. The ECO must be given a chance to mark vegetation that is to be conserved before the Contractor begins clearing the site. Permission / permits will be obtained from DAFF before any clearing of any indigenous trees are to be done. | During layout and establishment | During site set up, and ongoing. | RE/ECO |
| Removal of vegetation will be avoided until such time as soil stripping is required. | All Phases | On going | RE/C |
| Except to the extent necessary for the carrying out of the works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted. | During layout and establishment | During site set up, and ongoing. | RE/ECO |
| Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. | During layout and establishment | Ongoing in camp site, haulage areas. | ECO |
| Disturbance to birds, animals and reptiles and their habitats should be minimised wherever possible.  | During layout and establishment | During surveys and preliminary investigations and ongoing. | RE/ECO |
| Trapping, poisoning and/ or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on site. | During layout and establishment | During site set up, and ongoing. | RE/ECO |
| Where the use of herbicides, pesticides and other poisonous substances has been specified, the Contractor shall submit a Method Statement. | During layout and establishment | During site set up, and ongoing. | RE/ECO |
| Gathering of firewood, fruit, muthi plants or any other natural material on site or in adjacent areas is prohibited. | During layout and establishment | Monitoring throughout the duration of the project. | ECO |
| Immediate re-vegetation of stripped areas and removal of aliens by weeding must take place. This significantly reduces the amount of time and money that must be spent on alien plant management during rehabilitation. | During layout and establishment | Monitoring throughout the duration of the project. | ECO |
| Areas identified as being sensitive by Specialists, the Engineer or the ECO and adjacent to any construction work are to be suitably demarcated to prevent damage by plant and labour. Temporary bonnox type fencing should be used and should be moved in phases as the construction progresses from one area to the next. | During layout and establishment | During surveys and preliminary investigations and ongoing. | RE/ECO |
| Waste Management |
| For waste management principles to be implemented during all phases of the project, refer to Section 8.7 of the EMP. | During layout and establishment | Monitoring throughout the duration of the project. | ECO |
| Landowner Consultation |
| Prior to commencement of site establishment activities, Eskom and the Contractor should put agreements in place with the affected landowners with regards to compensation for damage to property caused as a result of construction activities (where applicable). | During layout and establishment | Prior to moving onto site. | RE/C |
| Any damage caused to adjacent properties or infrastructure, as a result of construction activities, should be fixed by the Contractor to the satisfaction of the landowner. | During layout and establishment | Prior to moving onto site. | RE/C |
| The ECO should have meetings with affected landowners monthly, to ensure that landowner issues and concerns are dealt with according to agreements made between Eskom, the contractor and the landowner. | During layout and establishment | Four monthly meetings | ECO |
| During the set up phase of the project, the Contractor needs to make contact with those people that are interested or affected by the development (IAPs).  | During layout and establishment | Prior to moving onto site. | E/C |
| Visual Impacts |
| Storage facilities, elevated tanks and other temporary structures on site should be located such that they have as little visual impact on local resident as possible.  | During layout and establishment | During surveys and preliminary investigations and site set up. | E/ECO |
| The Contractor shall ensure that any lighting installed on the site for his activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area. | During layout and establishment | Monitoring throughout the duration of the project. | E/C |
| Lighting installed shall, as far as practically possible, be energy efficient. Lighting utilised on site shall be turned off when not in use. | During layout and establishment | Monitoring throughout the duration of the project. | E/C |
| Heritage Impacts |
| Known sites of Heritage or Cultural importance should be clearly marked and fenced off prior to the commencement of construction activities, in order that they can be avoided during construction activities. All construction workers should be informed that these are no-go areas, unless accompanied by the individuals or persons representing the contractor as indicated above.  | During layout and establishment | During site set up and ongoing. | E/C/ECO |
|  Safety and Security |
| The site should be secured with fencing, in order to reduce the opportunity for criminal activity in the locality of the construction site. | During layout and establishment | Monitoring throughout the duration of the project. | RE/C |
| Flammable materials should be stored as far as possible from adjacent residents / businesses. Firefighting equipment should be present on site at all times as per OHSA. | During layout and establishment | Monitoring throughout the duration of the project. | RE/C |

# SUBSTATION AND POWERLINE CONSTRUCTION PHASE

| **Mitigation Measures** | **Stage / Duration** | **Frequency** | **Responsibility** |
| --- | --- | --- | --- |
| Stormwater Management |
| **A: Construction Camp*** + The C and RE must monitor and attend to the drainage of the construction camp site to avoid standing water and / or sheet erosion during the construction phase.
	+ Run-off from the camp site must not discharge into neighbours’ properties.
 | Construction Phase | Continuous | RE & C |
| **B: Contractors Camp*** + The C and RE must monitor and attend to the drainage of the contractors camp site to avoid standing water and / or sheet erosion during the construction phase.
	+ Run-off from the camp site must not discharge into neighbours’ properties.
 | Construction Phase | Continuous | RE & C |
| Surface and Groundwater Pollution Prevention |
| Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimise pollution risk and reduced bunding capacity. | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| Water from the cement mixing area should be channeled to a conservancy tank for removal from the site to a licensed disposal facility. | Construction Phase | During site set up, to be monitored weekly | C/RE |

| Vegetation Clearance, Animal and Habitat Disturbance |
| --- |
| Also refer to Section 11.6 under the Pre-Construction Phase |
| * No open fires should be allowed in areas containing natural vegetation, especially during the dry season.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * A rubble clean-up plan must be implemented throughout the duration of the construction phase.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * During construction, the construction area and immediate surroundings should be monitored regularly for emergent invasive vegetation.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * Surrounding natural vegetation should not be disturbed, to minimize chances of invasion by alien vegetation.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * All alien seedlings and saplings must be removed, as they become evident, for the duration of the construction phase. Is this necessary to be in the EMP because contractor will not pull weeds out
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * Manual / mechanical removal is preferred to chemical control.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction site. This should be verified by the RE/ECO.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * An alien invasive eradication and monitoring plan must be compiled and implemented whereby all emergent invasive species are removed during construction.Does this really have to be done and mentioned in the EMP ?
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * As far as possible, construction should be limited to the daylight hours in order to minimise the need for lights to avoid unnecessary faunal disturbance.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * No wild animal may under any circumstance be handled, removed or be interfered with by construction workers.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * No wild animal may be fed on site.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * No wild animal may under any circumstance be hunted, snared, captured, injured or killed. This includes animals perceived to be vermin. Checks of the surrounding natural vegetation must be regularly undertaken to ensure no traps have been set. Any snares or traps found on or adjacent to the site must be removed and disposed of.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| * All food should be securely stored away to prevent attraction of faunal species and all rubbish should be disposed of away from the site. Bins located around the infrastructure should have tightly fitting lids to prevent faunal species raiding the bins and thereby becoming habituated to humans.
 | Construction Phase | Monitoring throughout the duration of the project. | RE/ECO |
| Material Laydown Area |
| All lay down areas outside of the construction camp shall be subject to the Engineer/ECO/EO's approval. Specifications for location, demarcation, permitted heights, stabilisation, weed-, dust and erosion control of stockpiles should be implemented. | Construction Phase | Continuous | RE |
| Use of Chemical Toilets |
| * Chemical toilets are to be maintained in a clean state and should be moved to ensure that they adequately service the work areas.
 | Construction Phase | Weekly inspection | RE/C |
| * A registered chemical waste company is to be used to remove waste from chemical toilets on site.
 | Construction Phase | Weekly Clean-up, or more regularly if required | RE/C |
| Worker Conduct |
| * Under no circumstances may open areas or the surrounding bush or any adjacent areas be used as a toilet facility.
 | Construction Phase | Continuous Observations | RE/C |
| A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules:* No alcohol / drugs to be present on site.
* No firearms allowed on site or in vehicles transporting staff to / from site, (unless used by security personnel).
* Prevent excessive noise.
* Prevent unsocial behaviour.
* Bringing pets onto the site is forbidden.
* No harvesting of firewood from the site or from the areas adjacent to it.
* Construction staff is to make use of the facilities provided for them, as opposed to ad-hoc alternatives. (e.g.: fires for cooking; the use of surrounding bush as a toilet facility is forbidden).
* Trespassing on private / commercial / traditional properties adjoining the site is forbidden.
* Driving under the influence of alcohol is prohibited.
* Other than pre-approved security staff, no workers shall be permitted to live on site.
 | Construction Phase | Monitoring throughout the duration of the project. | C/ECO/RE |
| Waste Management, Hygiene and Cleanliness |
| * Bins should have liner bags for efficient control and safe disposal of waste.
 | All Phases | Continuous | RE & C |
| * The site shall be kept neat and clean at all times. Littering is prohibited.
 | All Phases | Continuous | RE & C |
| * No on-site burying or dumping of any waste materials, vegetation, litter or refuse shall occur. The Contractor shall provide scavenger and weatherproof bins with lids of sufficient number and capacity to store the solid waste produced on a daily basis. The lids shall be kept firmly on the bins at all times. Bins shall not be allowed to become overfull and shall be emptied regularly. Waste from bins may be temporarily stored on site in a central waste area that is weatherproof and scavenger-proof, and which the RE/ECO has approved.
 | All Phases | Continuous | RE & C |
| * All solid waste shall be disposed of off-site at an approved landfill site. The Contractor shall supply the RE/ECO with a certificate of disposal.
 | All Phases | Continuous | C |
| * The Contractor shall ensure that all litter is collected from the work and camp areas daily.
 | All Phases | Continuous | C |
| * The Contractor shall ensure that his camp and working areas are kept clean and tidy at all times.
 | All Phases | Weekly monitoring. | C |
| * Bins and / or skips should be emptied regularly and waste should be disposed of at a registered landfill site. Waybills for all such disposal are to be kept by the Contractor for review by the Engineer / ECO.
 | All Phases | Monitoring throughout the duration of the project. | C/RE/ECO |
| * Eating areas should be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness.
 | All Phases | Monitoring throughout the duration of the project. | C/RE/ECO |
| * The excavation and use of rubbish pits is forbidden.
 | All Phases | Monitoring throughout the duration of the project. | C/RE/ECO |
| * Burning of waste is forbidden.
 | All Phases | Monitoring throughout the duration of the project. | C/RE/ECO |
| * A fenced area must be allocated for waste sorting and temporary storage.
 | All Phases | During site set up. | C/RE/ECO |
| * Individual skips for different types of waste (e.g. ‘household’ type refuse, building rubble, etc.) should be provided.
 | All Phases | During site set up. | C/RE/ECO |
| Materials Delivery and Transportation |
| * The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Materials Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Materials Specifications.
 | Construction Phase | During Delivery | C |
| * Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.
 | Construction Phase | Continuous | C |
| Management of Materials Storage Area – Including Hazardous and Dangerous Substances |
| *Definition of hazardous substances / materials are those that are potentially: poisonous, flammable, carcinogenic or toxic. Some examples of hazardous substances / materials:** *diesel, petroleum, oil, bituminous products*
* *cement*
* *solvent based paints*
* *lubricants*
* *explosives*
* *drilling fluid*
* *pesticides, herbicides*
* *LPG (Liquid Petroleum Gas)*
 |
| Storage areas containing hazardous substance / materials must be clearly sign posted. | All phases | During site set up. | RE/C |
| Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. | All phases | During site set up. | RE/C |
| The use and storage of all materials shall be controlled. Care shall be taken to ensure that fuels and chemicals do not leach into the ground. Adequate spillage containment measures shall be implemented, such as cut off drains, berms etc. Fuel and chemical storage containers shall be set on a concrete plinth and within a containment bund. The necessary firefighting equipment shall be maintained on site where construction is taking place to deal with any fire incidents. | Construction Phase | Continuous | C |
| Storage areas should be secure so as to minimise the risk of crime. They should be safe from access by children and animals etc. | Construction Phase | Continuous | C |
| All potential hazardous or polluting materials shall be stored within the fenced off materials area, as far away from oncoming traffic and from drainage inlets as possible.  | Construction Phase | Continuous | C |
| All manufactured and/ or imported material shall be stored within the materials storage area, and, if so required by the Project Specification, out of the rain.  | Construction Phase | Continuous | C |
| Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental releases or escapes.  | Construction Phase | Continuous | C |
| Where applicable, contractors shall prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc.) and submit these to the Engineer for approval prior to commencement of any work. | Construction Phase | On award of contract. | C/E/ECO |
| Where possible, a signed document from the supplier of natural materials should be obtained confirming that they have been obtained it in a sustainable manner and in compliance with the relevant legislation. | Construction Phase | On receipt of the natural materials. | C |
| Where materials are borrowed (mined), proof must be provided of authorisation to utilise these materials from the landowner / mineral rights owner and the Department of Mineral Resources. | Construction Phase | On receipt of the borrowed materials. | C |
| Refuelling of Plant |
| Where reasonably practical, plant shall be refuelled at a designated re-fuelling area or at the construction camp. If it is not reasonably practical than the surface under the temporary refuelling area shall be protected against pollution to the satisfaction of the RE/C/ECO prior to any refuelling activities. The Contractor shall ensure that there is always a supply of absorbent material (not saw dust) readily available to absorb/ breakdown and where possible is designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200l of hydrocarbon liquid spill. This material must be approved by the RE/C/ECO prior to any refuelling or maintenance activities. | Construction Phase | During refuelling | RE/C/ECO |
| Using Materials – Non Hazardous, Hazardous and Dangerous Goods |
| Heating of bitumen products shall only be undertaken using the LPG or similar zero emissions fuels.  | Construction Phase | Monitoring throughout the duration of the project. | C/ECO |
| Staff dealing with these materials / substances must be aware of their potential impacts and follow appropriate safety measures.  | Construction Phase | During staff induction and ongoing as necessary. | C/ECO |
| Should cement be mixed on site, it should be mixed on an impervious surface, and water from the cement mixing area should be channeled to a conservancy tank for removal from the site to a licensed disposal facility. | Construction Phase | Prior to establishment of storage area. | C |
| Air Quality Management / Soil Management |
| Camp construction / haulage road construction – areas that have been stripped of vegetation must be dampened periodically to avoid excessive dust. | Construction Phase | Ongoing – more frequently during dry and windy conditions. | C/ECO |
| Vehicles travelling along the access roads must adhere to the speed limits to avoid creating excessive dust. Limit vehicle speeds on dirt road deviations to 40km/h. However, vehicle speeds is dependent on the type of vehicle and condition of the road. Generally according to Eskom’s procedure the maximum speeds that are allowed on gravel roads is maximum of 60km/h. | Construction Phase | Monitoring throughout the duration of the project. | C/ECO |
| The Contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LPG gas cookers may be used provided that all safety regulations are followed.  | Construction Phase | Monitoring throughout the duration of the project. Ongoing. | E/C/ECO |
| Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution; | Construction Phase | Monitoring throughout the duration of the project. Ongoing. | E/C/ECO |
| Soil stockpiles will be located in sheltered areas to limit the erosive effects of the wind; | Construction Phase | Monitoring throughout the duration of the project. Ongoing. | E/C/ECO |
| Removal of vegetation will be avoided until such time as soil stripping is required. | Construction Phase | Monitoring throughout the duration of the project. Ongoing. | E/C/ECO |
| Environmental friendly soil stabilisers may be used as additional measures to control dust on gravel road and construction area, and all roads used for traffic accommodation will be surfaced. | Construction Phase | Monitoring throughout the duration of the project. Ongoing. | E/C/ECO |
| Existing vegetation will assist in screening the site, control dust and help prevent soil erosion. All existing vegetation on and adjacent to the development shall be retained unless otherwise instructed by the Engineer. | Construction Phase | Monitoring throughout the duration of the project. | ECO |
| No unnecessary stripping of vegetation shall be undertaken. The time that stripped areas are left open to exposure should be minimised wherever possible. Care should be taken to ensure that lead times are not excessive. | Construction Phase | Throughout the duration of the project. | E/ECO |
| Wind screening and storm water control should be undertaken to prevent soil loss from the site.  | Construction Phase | During site set up. | E/ECO |
| Procedures that are in place to conserve topsoil during the construction phase of the project are to be applied to the set up phase, i.e. topsoil is to be conserved while providing access to the site and setting up the camp.  | Construction Phase | Daily monitoring during site set up. | E/ECO |
| Topsoiling and re-vegetation shall commence immediately after the completion of an activity and at an agreed distance behind any particular work front. | Construction Phase | Daily monitoring during site set up. | E/ECO |
| Stormwater Management |
| During construction un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw / hay or bundles of cut vegetation should be dug into the soil in contours to slow surface wash and capture eroded soil. The spacing between rows will be dependent on slope. | During Construction | Monitoring throughout the duration of the project. | E |
| Earth, stone and rubble is to be properly disposed of so as not to obstruct natural pathways over the site; i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. | During Construction | Monitoring throughout the duration of the project. | E |
| Rivers and Streams***It should be noted that this section is only relevant should construction take place on Site Alternative 3. However, these mitigation and monitoring measures provided in this Sections are general mitigation and monitoring measures normally provided for constructions within floodline and riparian areas. Should Site Alternative 3 be selected as the preferred alternative, a Floodline Delineation and Riparian Habitat Assessment and Delineation must be undertaken. The findings and recommendation of these assessments must be incorporated into the Final EMP.*** |
| The Contractor shall minimise the extent of any damage to the flood plain to that necessary to complete the works, and shall not pollute the river system as a result of construction activities. The Contractor shall not cause any physical damage to any aspects of a watercourse, other than that necessary to complete the works as specified and in accordance with the accepted method statement. The method statement is to be accepted by the Engineer in consultation for the ECO. This is to ensure that the method statement is in line with the method statements provided in Water Use Authorisations *(where applicable).* | During Construction | Monitoring throughout the duration of the project | C |
| Construction activities shall not permanently alter the surface or subsurface flow of water through the flood plain area. No construction materials shall be stockpiled on the flood plain. | During Construction | Monitoring throughout the duration of the project | E/ECO |
| Any excavation within the flood plain shall be by hand where possible. Where mechanical excavations are undertaken, the engineer/ECO should be present on site to monitor the excavation activities. Where necessary, a Wetland Specialist should be present on site. The Contractor shall ensure that all construction activities within the flood plain including the removal of vegetation, stockpiling of top material, excavations and backfilling of excavations and rehabilitation occur within a maximum of a three week period. | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| The Contractor shall submit a method statement for review to the Engineer within 14 days prior to commencing construction within the 1 in 50 year floodline. This is to ensure that the method statement is in line with the method statements provided in Water Use Authorisations *(where applicable).* The method statement shall highlight (but not be confined to) the following issues:1. containment of contaminated runoff and contaminated water;
2. width of working servitude (if not already detailed in project specification);
3. final expected profile of river/ stream banks;
4. reinstatement and rehabilitation of river/ stream banks.
 | 14 days prior to commencing construction within the 1 in 50 year floodline | Monitoring throughout the duration of the project | C |
| All temporary and permanent fill used adjacent to, or within, the river / streambed shall be of clean sand or larger particles. Silts, clays, granitic sands and boulders shall not be permitted in the fill. | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| Plastic sheeting, sandbags or geofabric approved by the Engineer/ECO/EO shall be used to prevent the migration of fines through the edges of the fill into the river. | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| Banks shall be suitably stabilised incrementally immediately after construction allows. Upkeep of stabilisation facilities shall be continuously maintained. | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| The Contractor shall remove herbaceous riparian vegetation as directed by the Engineer/ECO/EO, with their root ball intact. This vegetation shall be kept moist by means of placing it in the shade, covered with moistened hessian cloth until it is replanted within a specified time period. | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| Rocks for use in gabion baskets/ reno mattresses shall not be obtained from a watercourse. | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| The Contractor shall not cause any physical damage to any aspects of a watercourse, other than that necessary to complete the works as specified and in accordance with the accepted method statement. | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| Wetlands***It should be noted that this section is only relevant should construction tale place on Site Alternative 3. However, these mitigation and monitoring measures provided in this Sections are general mitigation and monitoring measures normally provided for constructions within wetland areas. Should Site Alternative 3 be selected as the preferred alternative, a Wetland Assessment and Delineation Study including a Wetland Rehabilitation Plan must be compiled. The findings and recommendation of these assessments must be incorporated in to the Final EMP.*** |
| * The infrastructure (pylons) associated with the lines should preferably be placed outside of wetland boundaries.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Damage to the wetland areas shall be minimised. The Engineer/ECO/EO shall approve demarcation of work area extent. All potential wetland areas shall be marked clearly on the plan and the Contractor shall submit a Method Statement to the engineer for review at least 14 days prior to commencing construction in a wetland. This is to ensure that the method statement is in line with the method statements provided in Water Use Authorisations (where applicable).
 | 14 days prior to commencing construction in a wetland | Monitoring throughout the duration of the project | C/E/ECO |
| * Construction may not permanently alter the surface or subsurface flow of water through the wetland.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Where applicable, the Contractor shall remove any wetland vegetation that would be affected by the constructions activities, as indicated by the ECO/EO, with their root ball intact. This vegetation shall be kept moist at all times and shall be placed in the shade and covered with moistened hessian cloth until replanting within a specified time period.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * No construction materials shall be stockpiled in any wetland areas.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * The post-construction profile of the wetland shall be returned to one similar to that before construction, with no created “ridge or channel” features present.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Hazardous material and chemicals should not be kept or handled within wetland and riparian areas. Hazardous substances must be kept in a demarcated area on an impervious surface. Any spillages from hazardous material should be cleaned immediately and transported to a landfill site that accepts hazardous material.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Cement and other material must be mixed in a demarcated area and not in wetland or riparian areas. Movement of contractors and vehicles within wetland and riparian areas should be minimised to avoid compaction of sediment and water pollution. Vehicle should also be serviced on a regular basis to avoid leaks and spills.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Solid waste should be removed on a regular basis and chemical toilets should be provided and should be serviced on a regular basis.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Any contractor’s camps should not be placed near any wetlands.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Topsoil and excavated soil must not be placed within the wetland or riparian areas. The soil that is excavated from these wetlands should not be used for construction, but rather for the rehabilitation process.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Sediment/silt traps or barriers must be installed, especially at the larger valley bottom wetlands. The barriers need to be maintained on a regular basis and any sediment and litter must be removed.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Any erosion that is caused by cuttings must be filled immediately to avoid siltation of the wetlands.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * The removal of vegetation must be kept to a minimum where possible. The time that soil is exposed must be limited and re-vegetation, or another covering method must be applied during the construction phase.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Vegetation must be removed in sections, as construction is taking place, and should not be removed throughout the extent of the construction area. The removal of woody plants must be avoided as these are usually slow growing in nature.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Re-vegetation must be completed using the appropriate wetland/endemic plants. Where possible, the vegetation must be removed intact to ensure that it can be planted again during rehabilitation.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Where vegetation is removed the compaction of wetland soils must be minimised to avoid an increase in surface runoff speeds.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * The establishment of exotic plants must be avoided.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Roads must be maintained to avoid erosion and the extent of roads must be minimised.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Where possible the area where construction will take place should be demarcated. Demarcation of the construction areas will ensure that only the required area is cleared of vegetation.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Erosion protection must be used in all areas where erosion may occur.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Erosion may be correlated with flow regulation and connectivity therefore must be maintained within these systems.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * Suitable indicators must be identified and monitored by a qualified wetlands specialist to ensure that the impacts are minimised and corrected timeously.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * A rehabilitation plan must be developed by an appropriately qualified specialist and the rehabilitation of wetlands should commence during construction.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| * The effectiveness of the plan must be monitored and the rehabilitation plans must be amended if required.
 | During Construction | Monitoring throughout the duration of the project | C/E/ECO |
| Noise Impacts |
| * Should there be complaints from the public regarding excessive noise necessary mitigation measures should be put in place, for examples, construction vehicles could be fitted with standard silencers.
 | During all phases | Prior to moving onto site. | E/C |
| * Equipment that is fitted with noise reduction facilities will be used as per operating instructions and maintained properly during site operations.
 | During all phases | Monitoring throughout the duration of the project. | E/C |
| * No amplified music shall be allowed on site. The use of radios, tape recorders, compact disc players, television sets etc. shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. The Contractor shall not use sound amplification equipment on site unless in emergency situations.
 | During all phases | Monitoring throughout the duration of the project. | E/C |
| * Construction activities generating output levels of 85 dB (A) or more, in residential areas, shall be confined to the hours 08h00 to 17h00 Mondays to Fridays. Should the Contractor need to work outside normal working hours, the surrounding communities shall be informed prior to the work taking place.
 | During all phases | Monitoring throughout the duration of the project. | E/C |
| Heritage Impacts |
| No sites, features or objects of cultural significance are known to exist in the study area, and therefore there would be no impact as a result of the proposed development, however, the following general mitigation measures should be adhered to:* Known sites should be clearly marked in order that they can be avoided during construction activities.
* The contractors and workers should be notified that archaeological sites might be exposed during the construction work.
* Should any heritage artefacts be exposed during excavation, work in the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
* All discoveries shall be reported immediately to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
* Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
* Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).
 | During all phases | Monitoring throughout the duration of the project. | E/C |
| Occupation Health and Safety |
| Potentially hazardous areas such as trenches are to be demarcated and clearly marked. | During all phases | Monitoring throughout the duration of the project. | E/C |
| Obstruction to drivers’ line of sight due to stockpiles and stacked materials must be avoided, especially at intersections and sharp corners.  | During all phases | Monitoring throughout the duration of the project. | E/C |
| Material stockpiles or stacks, such as pipes must be stable and well secured to avoid collapse and possible injury to site workers / local residents. | During all phases | Monitoring throughout the duration of the project. | E/C |

# SUBSTATION AND POWERLINE OPERATIONS

| **Activity** | **Mitigation Measures** | **Duration** | **Frequency** | **Responsibility** |
| --- | --- | --- | --- | --- |
| Site Hand Over |
| Take over works | During site take / hand over, the site must be accepted from the relevant Distribution Business Unit and handed over.All relevant legal and other documentation must be handed over to the relevant Business Unit on project completion and site handover. | At commencement of operational phase | Once off | SM/DBU |
| Access Control, Access Roads, Access Gates, Fences and Security |
| Gate Control | Gates must be fitted with Eskom locks throughout the life of the substation. | Permanent | Throughout | SM/SP |
| Such gates shall be clearly marked by complying with legal and other internal Eskom requirements. | Once off | Annually | C/ECO |
| Access Control and Security | The substation site will be fenced off with electric fencing in compliance with legal and internal Eskom requirements and access control will be very strict with 24 hour security present at the substation or as per substation individual risk assessment and legal requirements. | Permanent | Throughout | SM/SP |
| Access to the new substation must be restricted. The access point should ideally be fenced off and gated along the main access road. | Permanent | Throughout | SP |
| No quad-bikes, motorcycles or off road vehicles and illegal hunting should be permitted in the adjacent properties. | Permanent | Throughout | SM/SP |
| No firearms (shotguns, air rifles or pellet guns) or catapults should be permitted on the property. | Permanent | Throughout | SM |
| Access Roads | Access road to substation to be maintained. | Permanent | Throughout | SM |
| Fences | Fencing should be maintained at all times to prevent unlawful access to the substation site. | Permanent | Throughout | SM |
| **As per Eskom’s standard procedure for vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247** |
| Access Control, Gates and Fencing, and Restriction of Activities on Private Land | In terms of Eskom’s servitude agreement, Eskom (or its appointed contractor) has the right to enter and be upon the property at any time whether it to be to perform work on the property itself, or to gain access to any adjacent property. This however does not mean that the landowner should not be consulted or made aware during these times, and therefore, Eskom will notify the owner of any intention to enter the property to cut trees and vegetation, or to perform any other Eskom related tasks, and will take reasonable measures to inform the landowner of Eskom’s intent to cut vegetation on the property or perform any other Eskom related tasks. Proof of the consultation must be kept. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| In order to assist with access, Eskom may erect gates in consultation with the property owner. Under no circumstances shall access be gained by cutting or “dropping” fences. All gates shall be left closed, unless otherwise instructed by the landowner, and the Eskom servitude gates shall be securely locked at all times. | Once off or when required | Once off or when required | LM |
| **As per Eskom’s Standard Procedure with regards to Access to Farms (32-1173), of June 2011** |
| Access Control, Gates and Fencing, and Restriction of Activities on Private Land | No person may climb or crawl over or through fences without the owners’ permission. No person may damage or remove a fence without the owners’ permission. Gates should be left as land owners require. | Permanent | Throughout | LM |
| All instances where access has been unduly restricted should be taken up with the Customer Services Area Manager to ensure a normalisation of the situation. The 2 lock system should also be enforced where it has been violated. The Customer Services Area Manager could bring the following to the attention of the landowner in terms of our way leave/servitude agreement:1. That access is being restricted.
2. That the removal of Eskom locks and gates without prior notice and agreement is illegal.
3. That security is required for accompaniment where the introduction of problem animals restricts access.
4. That there is a need to use motorised equipment for bush clearing where trees pose a risk to the safe operation of the line.
 | Permanent | Throughout | LM |
| An effort should be made through the regional task team to convince game farm owners and other influential stakeholders (Government & Game farming and Agricultural Union bodies) to buy into the following;1. The numbering of gates.
2. The labelling of gates stating the following:
	1. That it is a game farm
	2. List of dangerous animals within enclosure
	3. Contact details
	4. That all entry and exit points comply with the Certificate of Adequate Enclosure Fencing Specifications.
	5. Entrance areas are to be cleared to improve visibility.
 | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| Notification of Intent to Visit Land**As per Eskom’s Standard Procedure with regards to Access to Farms (32-1173), of June 2011** |
| Notification of Intent to Visit Land | **Activity**: Each outage is planned individually. Project leaders play a critical role in ensuring that thorough planning takes place prior to the execution of the outage. Planning the outage entails a series of discussions with stakeholders. Key to the success of an outage is the use of project management principles.**Action:** Eskom will notify customers at least 10 days in advance through the appropriate media – either in writing, electronically or telephonically. Should its best attempts to communicate fail, the work will proceed regardless. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| **Activity:** Visits and activities that do not coincide with supply interruptions, such as vegetation control, live line work and line inspections.**Action:** Eskom will notify customers at least 48 hours in advance through the appropriate media – either in writing, electronically or telephonically. Should its attempts to communicate fail, the work will proceed regardless. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| **Activity:** Extended negotiations and interaction with the customer and adjoining property owners include supply proposals, quotations, guarantees, line route planning, and construction project planning and execution.**Action:** All stakeholders must cooperate to enable Eskom to provide the customer with a project schedule reflecting the period during which the construction and commissioning activities will take place. In addition, customers may request a work order number to be verified with the contact centre. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| **Activity:** All visits to individual customers, i.e. sales or service-related activities, investigations (technical, non-technical), claims, etc.**Action:** Must take place by appointment. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| **Activity:** Access to the farm at fixed intervals for activities such as meter reading.**Action:** Eskom will give notice on the monthly bill of a four-day period in the following month during which either an estimate or a visit for an actual meter reading is scheduled. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| **Activity:** Routine line patrols by maintenance staff.**Action:** Field Services staff must report all new game fences or game farming activities encountered on routine line patrol or fault repair activities to the Land Development section for mapping and to Customer Services Area Manager to engage the landowner for corrective action if Eskom was not informed or did not agree to such a change. This is seen as an *ad hoc* way of obtaining information of newly created game farms from normal business activities. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| Unplanned/unscheduled visits | **Power interruption caused by external factors****Activity:** Rapid power restoration without any delay is in the interest of both Eskom and the customer. This is dependent on free movement.**Action:** All Eskom staff as well as representatives of Eskom contractors will carry identity cards containing their photographs to indicate whether they are Eskom employees or Eskom contractors. In addition, customers may request a work order number to be verified with the contact centre. Vehicles must be clearly marked. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| **Ad hoc line inspections in response to poor performance****Activity:** These line inspections include the process of technical investigation to ensure standard action and response in maintaining quality of supply, and are instituted on short notice, not affording time for extended planning, to eliminate the possibility of substandard plant conditions.**Action:** All Eskom staff as well as representatives of Eskom contractors will carry identity cards containing their photographs, indicating whether they are Eskom employees or Eskom contractors. In addition, customers may request a work order number to be verified with the contact centre. Vehicles must be clearly marked | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| Identification of Visitors and Vehicles**As per Eskom’s Standard Procedure with regards to Access to Farms 32-1173), of June 2011** |
| Identification of Visitors | All Eskom staff will carry identity cards containing their photographs, indicating that they are Eskom employees. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| Identification of Vehicles | Eskom vehicles will be clearly marked on the door. Where necessary to undertake any inspections or attend to any maintenance issues after dark, vehicles will be fitted with amber rotating lights. Vehicles of Eskom contractors must have a magnetic strip on the side containing the words “Eskom contractor”, as well as an amber rotating light, should these vehicles operate after dark. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| Eskom Contractor Identification | The Eskom contractor must be able to identify himself as an Eskom contractor. Eskom contractors will carry identity cards containing their photographs, indicating that they are contractors. In the case of unplanned activities, the contractor must be in possession of a work order number. In the case of planned and routine activities, the customer will be notified. Vehicles must be clearly marked. | During each inspection or maintenance event | During each inspection or maintenance event | LM |
| Compensation Due to Damage to Property |
|  | Any damage to property, including but not limited to, crops, stock, fencing and gates, which occurred during maintenance activities shall be compensated, repaired or replaced at Eskom’s expense, to the satisfaction of the landowner. All damages should be reported to the Line and Servitude Manager. | Whenever required | Whenever required | Lm |
| Access to any type of nature reserve requires specific permission, which should be arranged with the appropriate authority or landowners. Because these reserves have both dangerous as well as very expensive game, a designated guide should always accompany visitors. This will ensure the safety of the visitor as well as prevent any claims against Eskom Holdings in the case of loss/death of expensive game. | Whenever required | Whenever required | LM |
| General Maintenance |
| Maintenance | All applicable standards, legislation, policies and procedures must be adhered to during operation. | Permanent | Throughout | SM |
| Regular inspection of the substation and loop-in lines must take place to monitor their status. | Permanent | Throughout | SM |
| Operational Phase Vehicle Traffic and Machinery |
| Heavy Machinery | Fuel and oil spillages as well as spillages of any other dangerous or hazardous substances should be avoided. | Per delivery | Per delivery | SM |
| The Substation Manager and / or contractor responsible for maintenance activities shall ensure that there is always a supply of absorbent material (not saw dust) readily available to absorb/ breakdown and where possible is designed to encapsulate minor hydrocarbon spillage. | Permanent | Throughout | SM |
| All areas where heavy machinery has access must be rehabilitated in terms of soil pollution. | Permanent | Throughout | SM |
| All vehicle traffic must remain on designated access roads No vehicles will be allowed onto vegetated areas. However, access routes does not always exist next to powerlines, and vehicles may need to travel on vegetated areas were no access road exists. Should any damage to vegetation occur the disturbed area will be rehabilitated. | Permanent | Throughout | SM |
| Insulator Oil Spillage and StorageAs per Eskom’s Standard Oil Spill Clean-Up and Rehabilitation Plan (ESKASABT0), November 2003 |
| Insulator Oil Spillage and Storage | The Oil Spill Clean-up and Rehabilitation Standard (Reference – ESKASABT0) needs to be implemented. | Permanent | Throughout | SM |
| Outdoor Storage of Oil filled Drums:* An outdoor oil storage area must be located in the open and at ground level, at least 15m from important buildings/equipment.
* Where the above distance cannot be achieved, a fire wall at least 1m higher than the oil drums must be provided between the drums and important buildings/equipment.
* In addition, outdoor storage areas should:
	+ Be located or provisions made so that spilled oil, irrespective of quantity, cannot be spread to buildings, equipment or other storage yards;
	+ Be kept clear of weeds, paper, waste and other combustible material to a distance of 8m from the storage area;
	+ Be provided with at least 1 x 9kg chemical powder fire extinguisher mounted in a weather proof housing near the storage area;
	+ Only be used for storage of oil or other combustible liquids;
	+ Be located where there is a minimum chance of accidental damage from vehicles.
 | Permanent | Throughout | SM |
| Indoor storage of Oil:* Oil may be stored in a building provided that:
	+ The building is constructed of non-combustible material;
	+ It is a stand-alone building solely used for storage of oil or other combustible liquids;
	+ Where the building used for storing oil is less than 15m from an important building or equipment, the wall of the oil store facing the building or equipment shall be a solid brick or concrete wall with no openings;
	+ Provision is made to contain oil spillages to within the building;
	+ At least 1 x 9kg chemical powder fire extinguisher is mounted in weather proof housing outside the building; and
	+ Flammable liquids such as petrol shall not be kept in the building.
 | Permanent | Throughout | SM |
| Immediate corrective action to limit any spillages should be implemented to minimize the environmental damage and reduce remediation costs. This can involve actions such as:* closing a valve;
* repairing the leak with rags, plugs or other appropriate material;
* repositioning the container so that the leaking area is at the highest level or lifting a fallen drum/container;
* placing a leaking container or equipment into a collecting tray or bund area; and
* Collecting the spilt oil in a container located underneath the leak or channelling the leak into a container.
 | Permanent | Incidental | SM |
| The containment of a spillage will involve an action that will either prevent or stop a spill from spreading. It is vital to prevent any oil spill from entering waterbodies such as drains, stormwater systems, dams or rivers. Containment of the oil near the source will minimize pollution and will enable easy clean-up and/or remediation. This shall be done using one or more of the following:* Soil barriers;
* Sand bags;
* Bund walls; and
* Absorbent materials.
 | Permanent | Incidental | SM |
| The free oil (puddles) shall be captured and put into a suitable container such as a drum or tanker for proper disposal as soon as possible. This oil shall not re-enter the Eskom insulating oil pool for regeneration and re-use in electrical equipment. | Permanent | Incidental | SM |
| After removal of excess oil, saw dust, suitable absorbents or solvents shall be used to complete the clean-up of the spill. This might include the removal of leaking equipment, cleaning of pavements, removing contaminated soil and vegetation, as well as disposing of clean-up equipment. The absorbing material shall be bagged and disposed of at a class HH registered site. PCB material shall be incinerated, encapsulated or de-chlorinated following consultation with NIOSC who will advise on the most viable option. | Permanent | Incidental | SM |
| To allow for a rapid response and clean-up to an oil spill, it is mandatory for all Eskom sites and vehicles handling oil to have access to a recommended basic spill kit. The vehicle kit shall be a smaller version of the site spill clean-up kit that meets the basic requirements for the volume of oil transported. This shall be used in the event of a spill that is less than 12 points as assessed using the table in Annex A of document ESKASABT0. Adequate and relevant training shall be given to all staff, maintenance teams and contractors working with oil on an Eskom site. This shall involve the actions to be taken following an oil spill as well as the use of the recommended oil spill kit.The recommended oil spill kit shall contain the following:* 2 pairs of latex or neoprene gloves;
* 20 heavy duty disposable bags (rubbish bags);
* 1 shovel;
* 1 hard bristle broom;
* 5 absorbent pads;
* 3 bags of absorbent material (cellulosic or other efficient material); and
* 1 pair of plastic goggles. If a station or site is close to surface water, oil absorbing material for removal and containment of oil on water shall form part of the standard kit.
 | Permanent | Incidental | SM |
| To limit any potential oil spill, it is recommended that all sites where insulating oil is stored are accredited in terms of Eskom’s NIOSC manual. For all other oils, the relevant Eskom standards shall be adhered to. UTO removed from equipment shall be promptly salvaged and returned to the closest, authorized regeneration facility after its removal from the equipment. | Permanent | Incidental | SM |
| To report the oil spill incident within 24 hours of occurrence to the relevant SHE departments for recording, investigation, and monitoring until corrective actions have been implemented and closed out. | Permanent | Incidental | SM |
| Operations and Maintenance of Oil Containment Structures, Oil Traps and Oil Dams |
| **Charmaine – Is this relevant at all for distribution substations? In this case as we are over 20MVA we will need an oil holding tank, in all instances of installed transformers you will need bunded area.** |
| Oil Containment structures | Bunded areas around transformers to be inspected on a as per schedule by Eskom responsible people by the responsible person to ensure it is free from any debris, vegetation and that the drain cover lids are in place and that there are no items lying around that could cause blockage should a spill occur. | Permanent | As per Eskom Schedule | SM/DBU |
| The integrity of all bund walls should be checked to ensure no cracks or openings have developed through wear and tear. | Permanent | Throughout | SM/DBU |
| Closed oil traps / dams to be inspected on a regular basis by the appointed responsible person and the following shall be checked and verified correct / in working order in accordance with specifications:* Water level;
* Valve system;
* Any blockage inflow and outflow;
* Any signs of oil spills;
* All drain covers to be opened when inspection is carried out;
* Ensure inspection drain covers are replaced securely after inspection;
* If there are any signs of oil it should be reported;
* Inspections to be recorded on the monthly inspection schedule; and
* Tool to the open drain covers to be available on site at all times.
 | Permanent | As per set time frame by Eskom responsible person as monthly might not be practical | SM/DBU. |
| Oil dams to be inspected regularly by the responsible person appointed at the site or work area. Inspections shall be carried out using the design at the criteria. The following to be checked and verified:* Free from debris / obstacles;
* Cover over trap preventing birds’ negative interactions;
* Staircase out of dams;
* Inlet and outlet pipe;
* Check cracks on joints;
* Perimeter fence and gate;
* Area around dam cleared from any vegetation for up to ±1 meter from perimeter fence;
* No vegetation growth or sand inside dam;
* Oil separation equipment in working order if available; and
* Ensure inspection is recorded onto the inspection schedule.
 | Permanent | Monthly | SM/DBU. |
| If oil is detected inside a trap or dam the root cause shall be identified and the oil managed on the following methods:1. Report to FSOU Environmental Practitioner and any action thereafter to be in agreement with HV Plant Manager / Supervisor, and Environmental Advisor;
2. Treat inside of dam / trap with bio-remediants;
3. Obtain qualified external contractor services to remove oil and clean the trap / dam
 | Permanent | Throughout | SM/DBU. |
|  | Permanent | Throughout | SM/DBU. |
| Oil holding facilities shall be designed to prevent pollution of the environment by oil if the total oil content of the largest unit of equipment on site is released (Standard for passive fire protection in Distribution substation yards DISASAAA0) | N/A | N/A | N/A |
| Soil Erosion Prevention**As per Eskom’s standard procedure for vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247** |
| Measures to prevent soil erosion shall be implemented at all times. Road construction may only be undertaken following agreement from authorities. | If an when required | During annual maintenance inspections | LM |
| Waste Management |
| Daily on-site waste management activities and waste management during maintenance activities. | All waste management activities shall be done in accordance to all legal requirement and internal Eskom Procedure: Eskom Environmental Waste Management Procedure (EPC 32 – 245) and the applicable procedures. | Permanent | Throughout | SM |
| * At all Eskom sites steps shall be taken to ensure:
	1. that sufficient containers or places are provided to contain litter; and
	2. that the litter is disposed of before it becomes a nuisance or causes a negative impact on the environment.
* Only permitted/licensed waste disposal facilities to be used.
* All Eskom waste disposal sites must be licensed in line with the applicable national legislation.
* Personnel involved in waste management must be appropriately trained in aspects of waste management, including the requirements of the Occupational Health and Safety Act, No 85 of 1993.
* Waste contractors transporting hazardous waste will be required to provide Eskom with a waste manifest procedure detailing the transportation, type of waste disposed of, quantities disposed of, and how and where the waste was disposed of, and providing a certificate of safe disposal. The transport of waste must be in accordance with national legislation.
* Records must be maintained in accordance with applicable legislation.
* Waste reporting must be in accordance with Annex K of the Eskom Environmental Waste Management Procedure (EPC 32 – 245) on a monthly basis
* In order to determine the correct disposal method for industrial waste, all potentially hazardous industrial waste must be classified and rated in accordance with the Department of Water Affairs and Forestry’s Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, Second Edition 1998. [Section 20(9), Environment Conservation Act of 1998, read with the Department of Water Affairs and Forestry’s [DWAF] Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, Second Edition 1998
* In order to facilitate the tracking of waste, waste manifests will be provided by the Contractor and will contain the following information: Onus lies on the waste generator to ensure that the following is correctly filled out on the waste manifest.
	1. Hazard class (SANS 10234)
	2. Hazard rating (of Class 6 wastes);
	3. Disposal method (in line with DWAF’s Minimum Requirements);
	4. Confirmation that the class, rating and method are in accordance with the aforesaid Minimum Requirements documents;
	5. Acknowledgement of receipt by the operator of the receiving facility.
* Waste will be transported in accordance with the obligations imposed on the “operator” and “driver” by GN R 225 to the National Road Traffic Act of 1996, including the associated SANS Codes of Practice.”

During the operational phase, there are no full time personnel on site, and therefore very little to no domestic waste is produced. Personnel only visit the substation during maintenance, outages, etc. Waste bins should be available on site. Waste control registers should be kept at the CNC. Copies of safe disposal certificates from a permitted landfill site to be obtained to ensure that the site is permitted before taking the waste out of site. Waste reporting must be in accordance with Annex K of the Eskom Environmental Waste Management Procedure (EPC 32 – 245) on a monthly basis, or less frequent, should waste production on site be less. | Permanent | Throughout | SM/DBU |
| An adequate number of waste bins should be provided on site for the disposal of general food wastes generated by the substation site personnel. Bins should be emptied on a weekly basis and wastes should be disposed of at a licensed landfill facility. Wastes will be transported to the landfill by a licensed waste service provider. | Permanent | Throughout | SM/SP |
| Littering is strictly prohibited | Permanent | Throughout | SM/SP |
| Under no circumstances may any wastes be burned on site | Permanent | Throughout | SM/SP |
| Container s or receptacles for the temporary storage of any broken insulators shall be provided on site at all times. Any broken insulators shall be stored in these receptacles. All shards from broken insulators shall be picked up and placed in these receptacles. Such wastes will be removed from site by a licensed waste service provider if and when required. | Permanent | Throughout | SM/SP |
| Wherever possible, materials will be recycled via a “Greens waste site”. To this end, containers for glass, paper, metals, plastics, organic waste and hazardous wastes (e.g. oil rags, paint containers, thinners) will be provided in sufficient quantity on the site. | Permanent | Throughout | SM/SP |
| All waste generated during operational phase must be removed and disposed of at a licensed waste disposal facility. | Permanent | Throughout | SM/SP |
| Littering is strictly prohibited | Permanent | Throughout | SM/SP |
| All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site. | Permanent | Throughout | SM/SP |
| Littering by the employees of the Contractor shall not be allowed. | Permanent | Throughout | SM/SP |
| Broken, damaged and unused nuts, bolts and washers shall be gathered and removed from site. | Permanent | Throughout | SM/SP |
| No material shall be left on site that may harm man or animals. | Permanent | Throughout | SM/SP |
| Any broken insulators shall be removed and all shards picked up. | Permanent | Throughout | SM/SP |
| Surplus concrete may not be dumped indiscriminately on site. Such wastes will be removed from site and will be disposed of at a licensed waste facility that accepts such wastes. | Permanent | Throughout | SM/SP |
| The washing of concrete trucks on site is prohibited. Any spilled concrete shall be cleaned up immediately. | Permanent | Throughout | SM/SP |
| Management of Vegetation within the Eskom Servitude**As per Eskom’s standard procedure for vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247** |
| Vegetation Management | Trees growing to a height in excess of the horizontal distance of that tree from the nearest Conductor which are identified as a risk to safe operation of the powerline shall be treated and prevented from growing in such a manner as not to endanger the line should they fall. | If and when required | During annual maintenance inspections | LM |
| All vegetation posing a risk to the line or preventing access for maintenance purposes shall be managed. | If and when required | During annual maintenance inspections | LM |
| In terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), “The supplier, or user of powerlines shall control vegetation in order to prevent it from encroaching on the minimum safety clearances of the power lines and the owner of the vegetation shall permit such control”. | If and when required | During annual maintenance inspections | LM |
| It is recommended that a minimum rolling three (3) year vegetation management programme be promoted per power line or feeder as part of the Management Programme. This will allow effective identification, management and follow up of problematic vegetation. | If and when required | During annual maintenance inspections | LM |
| Trees, shrubs, grass, natural features and topsoil, which are not removed during the vegetation control operations, shall be protected from damage during operation of the powerline. Disturbance of the surface of the earth shall only be allowed for access purposes. | If and when required | During annual maintenance inspections | LM |
| Various species of indigenous vegetation are protected by law in terms of which it is necessary to obtain a permit from the relevant authority, in order to cut them. The responsibility for obtaining the permit shall remain with Eskom, unless allocated to the Contractor in terms of a formal contract. Eskom however remains accountable. The latest list of National protected trees is available off SHE Web, but it must be realised that provincial legislation has specific requirements in terms of protected species. These can be accessed off the Legal Register, | If and when required | During annual maintenance inspections | LM |
| Where there is any doubt as to whether a tree species is protected or not, the Department of Forestry and Fisheries or the local Eskom environmental practitioner in the area shall be consulted. | If and when required | During annual maintenance inspections | LM |
| Indigenous trees and bushes that do not grow high enough to cause interference with the powerline or cause a fire hazard, shall not be cut down or trimmed. | If and when required | During annual maintenance inspections | LM |
| Vegetation should be trimmed where it is likely that it intrudes on the minimum vegetation clearance distance, (MVCD) or will intrude on this distance before the next scheduled clearance. (Usually three (3) years). The MVCD is determined from GNR 1593 of 12 August 1988, Electrical machinery regulations. The distance “To buildings, poles and structures not forming part of powerlines” is used as the guide. As a rule of thumb indigenous trees and shrubs will grow at approximately one (1) metre per year under good conditions. The MVC can be reduced in sensitive systems or where aesthetic considerations need to be addressed. Compliance to Eskom Procedure: Procedure for Vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247 | Permanent | Throughout | LM |
| For self-supporting structures. Clear all vegetation within proposed / existing tower and stay positions and within a maximum (depending on the tower type and voltage) radius of 5 m around the position, including de-stumping / cutting stumps to ground level, treating with a herbicide and re-compaction of soil. Compliance to Eskom Procedure: Procedure for Vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247 | If and when required | During annual maintenance inspections | LM |
| Trees growing to a height in excess of the horizontal distance of that tree from the nearest conductor which are identified as a risk to safe operation of the powerline shall be treated and prevented from growing in such a manner as to endanger the line should they fall. Compliance to Eskom Procedure: Procedure for Vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247 | If and when required | During annual maintenance inspections | LM |
| Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In Terms of these regulations, Eskom shall “control” i.e. to combat category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom. | If and when required | During annual maintenance inspections | LM |
| Control programmes should be included as part of the Environmental Management Plans, and will need to be area and species specific. Due to the nature of alien vegetation, this programme implementation may need to be more frequent than the three year interval recommended for indigenous vegetation. Alien vegetation can grow at rates significantly faster than 1 (one) metre per year. | If and when required | During annual maintenance inspections | LM |
| Care must be taken to ensure alien vegetation is not spread as a result of vegetation management processes through the transport of seeds or other vegetative material from one site to another. | If and when required | During annual maintenance inspections | LM |
| Bush Clearing Requirements for the Maintenance of Existing Powerline Servitudes**Environmental Procedure:****Procedure for vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247** |
| Centre line for proposed powerline | **Standard Procedures:**Specification for width of vegetation clearance on new lines (above 33kV) shall be determined based on the EIA and EMP. New power line 33kV and below an 8 metre (or asDetermined per site) wide strip of identified vegetation along the centre line should be cleared. If required, a 5 meter wide strip shall be cut close to the ground (50 mm) for access purposes.**Follow-Up:**Re-growth shall be cut within 50 mm of the ground and/or treated with herbicide as necessary. | If and when required | During annual maintenance inspections | LM |
| Tower Position and support/stay-wire position | **Standard Procedures:**Clear all vegetation within proposed tower position and within a maximum (depending on the tower type and voltage) radius of 5m around the position, including de-stumping / cutting stumps to ground level, treating with a herbicide and re-compaction of soil.**Follow-Up:**Re-growth to be cut at ground level and treated with herbicide as necessary. | If and when required | During annual maintenance inspections | LM |
| Indigenous vegetation within servitude area (outside of the maximum 8m strip) | **Standard Procedures:**Selective trimming or cutting down of those identified plants interfering or posing a threat to the integrity of the powerline.**Follow-Up:**Selective trimming. | If and when required | During annual maintenance inspections | LM |
| Alien Species (Declared weeds ito CARA Reg 229 within servitude area (outside of the maximum 8m strip) | **Standard Procedures:**Control programme to be implemented as per above procedure. Trimming need not be selective.**Follow-Up:**Cut and treat with appropriate herbicide. | If and when required | During annual maintenance inspections | LM |
| Herbicide Use**Procedure for vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land EPC 32-247** |
| Use of Herbicide | The use of herbicides shall be in compliance with the terms of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947). | If an when required | During annual maintenance inspections | LM |
| In terms of the above Act, only a registered pest control operator may apply herbicides on a commercial basis. All application of herbicides shall be carried out under the supervision of a registered pest control operator. | If an when required | During annual maintenance inspections | LM |
| When Eskom applies herbicides on Eskom owned property, (or substations under the control of Eskom) then Eskom employees may do this provided they have been appropriately trained and that responsibility is taken for this work. Therefore no need for the person to be registered as a PCO, or working under the supervision of a PCO.  | If an when required | During annual maintenance inspections | LM |
| When Eskom applies herbicides on its own powerline servitudes, or land not owned by Eskom, then its own employees may not undertake this unless they are registered as a PCO. When contractors are appointed to undertake this, this work must be undertaken by a PCO, or under the direct supervision (meaning the PCO must be on-site) of a PCO. | If an when required | During annual maintenance inspections | LM |
| In cases when Eskom’s Vegetation Management, who are Eskom staff, are “contracted” by an Eskom Division to apply herbicides on servitudes, then they must undertake this under the “management” of a registered PCO. There is no need for a PCO to be on-site at all times in this particular case. | If an when required | During annual maintenance inspections | LM |
| A daily register shall be kept of all relevant details of herbicide usage as stipulated in Act 36 of 1947. | If an when required | During annual maintenance inspections | LM |
| Biodiversity (Fauna and Flora) and Vegetation Monitoring |
| Avifauna Monitoring | Monthly monitoring of the power line should be conducted and all species electrocuted should be recorded and the data should be submitted to Birdlife SA and EWT. | Permanent | Throughout | SM |
| Vegetation Monitoring | An alien invasive eradication and monitoring plan must be compiled to ensure that the re-emergence of invasive species is monitored continuously during the operational phase. | Permanent | Throughout | SM |
| All alien seedlings and saplings must be removed as they become evident for the duration of the operational phase. | Permanent | Throughout | SM |
| Eskom shall control vegetation in order to prevent it from encroaching on the minimum safety clearances of the substation and the owner of the vegetation shall permit such control | Permanent | Throughout | SM |
| Any recruitment of exotic vegetation to be managed on an ongoing basis until indigenous pioneering vegetation has dominated the disturbed areas. These species should be limited to naturally-occurring species representative of the vegetation type for the locality. Ongoing monitoring of exotic vegetation recruitment should be undertaken and any recruitment controlled | Permanent | Throughout | SM |
| Biodiversity | Indigenous vegetation must be maintained on the servitude on an annual basis and all exotics removed as they appear and disposed of appropriately. | Permanent | During Annual Maintenance | SM |
| No faunal species must be harmed by operational staff during any routine checks of the substation and loop-in lines. | Permanent | Throughout | SM |
| No animals should be intentionally killed or destroyed and poaching and hunting should not be permitted on the site.  | Permanent | Throughout | SM |
| No firearms (shotguns, air rifles or pellet guns) or catapults should be permitted on the property; | Permanent | Throughout | SM |
| All maintenance activities should be carried out according to generally accepted environmental best practices. In particular, care should be taken in the vicinity of the seasonal pans, wetlands and grassland areas. | Permanent | Throughout | SM |
| In the event of a bird electrocution, within the substation yard, during the operational lifespan of the substation, site specific recommendations will be provided to the utility by the EWT. | Permanent | Throughout | SM |
| Vehicles and machinery can impact on natural vegetation causing irrevocable damage to the natural habitat available to resident avifauna. When undertaking maintenance activities, particular care should be taken in the vicinity of the seasonal pans, wetlands and grassland areas. Do not drive machinery or vehicles through wetlands, pans, seep areas, streams or drainage lines. Make use of existing roads; | Permanent | Throughout | SM |
| Maintenance crews to monitor for bird collisions and to mitigate for this impact within areas identified as hotspot collision areas not previously identified during the pre-construction and construction phase. | Permanent | Throughout | SM |
| Heritage |
| Heritage | ECO/RE to inform substation manager of any artefacts uncovered during the construction phase. Care should be taken when maintenance activities are undertaken in areas where artefacts were uncovered. Should any artefacts be uncovered, work is to cease immediately and such discoveries should be reported to the local Environmental Practitioner who will ensure an archaeologist is contacted | At commencement of operational phase | Throughout | LM |
| Fire prevention |
| Fire prevention | Firefighting equipment shall be available at all times and shall be inspected regularly. | Permanent | Throughout | SM |
| A fire evacuation plan needs to be drafted to be as practical as possible in terms of the site layout. The plan shall be approved by the responsible Fire Chief in the area.  | Once Off | Throughout | SM |
| Appropriate emergency contact numbers (e.g. Fire Department) must be clearly displayed on site.  | Permanent | Throughout | SM |
| Regular fire drills must be implemented and relevant training shall be given as required. All fire-fighting equipment must be clearly signposted and access ensured at all times.  | On a regular basis | Throughout | SM |
| **As per Eskom’s Distribution Fire Risk Management (34-132) January 2007** |
| All new distribution substations shall comply with the Eskom standard, “*Distribution Fire Risk Management*”, Ref: DST 34-132 | At commencement of operational phase | Throughout | SM/DBU |
| Substations shall comply with DISASAAA0: Passive Fire Protection in Distribution Substation Yards | Permanent | Annually | SM/DBU |
| Substation where oil holding dams have been provided shall make provision in their maintenance schedules to clean out the dams on an annual basis. | Permanent | Annually | SM/DBU |
| At least 1 X 9 kg chemical powder or 1 X 6,8 kg (minimum mass rating) CO² fire extinguisher shall be available only whilst work is being carried out at the substation. These fire extinguishers shall be brought on site by those working at the substation or be permanently fixed at the relay room in the substation. | At commencement of operational phase | Throughout | SM/DBU |
| Where any strategic substation does not fall under the protection of a fire brigade, the nearest fire brigade to that substation shall be identified. | At commencement of operational phase | Throughout | SM/DBU |
| Any fire brigade that will be required to respond to a strategic substation, whether it is as a result of the substation falling within its jurisdiction or because of a service level agreement, fire fighters from that fire brigade, shall be invited to visit the substation. | Permanent | Biannually | SM/DBU |
| A written pre-fire plan to facilitate firefighting and reduce the possibility of injury to firemen shall be drawn up in conjunction with the relevant fire brigade and the responsible Supervisor or engineering Assistant for the substation. The pre-fire plan shall, as a minimum, address the following:* Name and location of substation (preferably include a map);
* Name of supervisor, Engineering Assistant and telephone numbers;
* Other relevant Eskom emergency telephone numbers;
* Access control, details of what the fire brigade should do when they arrive on site, particularly when the substation is unattended;
* When will it be safe to commence firefighting;
* Who will give authorisation to start the fire fighting;
* Precautions the fire brigade should take during a fire in the high voltage yard;
* Nearest water supply that can be used for firefighting (if any);
* Oil content of transformers;
* Any other aspect that the fire brigade should be aware of that will facilitate firefighting or reduce the possibility of injury to firemen.
 | At commencement of operational phase | Throughout | SM/DBU |
| A copy of the pre-fire plan shall be kept by the fire brigade as well as at the substation. The emergency telephone list shall be checked and updated every three months. | At commencement of operational phase | Throughout | SM/DBU |
| Zero Control shall be made aware of which fire brigades will respond to what substations. The emergency telephone numbers at Zero Control shall also be checked and updated every three months. | At commencement of operational phase | Throughout | SM/DBU |
| Outdoor Storage of Oil filled Drums:* An outdoor oil storage area must be located in the open and at ground level, at least 15m from important buildings/equipment.
* Where the above distance cannot be achieved, a fire wall at least 1m higher than the oil drums must be provided between the drums and important buildings/equipment.
* In addition, outdoor storage areas should:
	+ Be located or provisions made so that spilled oil, irrespective of quantity, cannot be spread to buildings, equipment or other storage yards;
	+ Be kept clear of weeds, paper, waste and other combustible material to a distance of 8m from the storage area;
	+ Be provided with at least 1 x 9kg chemical powder fire extinguisher mounted in a weather proof housing near the storage area;
	+ Only be used for storage of oil or other combustible liquids;
	+ Be located where there is a minimum chance of accidental damage from vehicles.
 | At commencement of operational phase | Throughout | SM/DBU |
| Indoor storage of Oil:* Oil may be stored in a building provided that:
	+ The building is constructed of non-combustible material;
	+ It is a stand-alone building solely used for storage of oil or other combustible liquids;
	+ Where the building used for storing oil is less than 15m from an important building or equipment, the wall of the oil store facing the building or equipment shall be a solid brick or concrete wall with no openings;
	+ Provision is made to contain oil spillages to within the building;
	+ At least 1 x 9kg chemical powder fire extinguisher is mounted in weather proof housing outside the building; and
	+ Flammable liquids such as petrol shall not be kept in the building.
 | At commencement of operational phase | Throughout | SM/DBU |