



Eskom Holdings SoC Ltd

**METHOD STATEMENT FOR CONSTRUCTION OF ETNA TRADE-ROUTE 88kV
POWERLINE WITHIN A WETLAND BUFFERZONE**

**JULY
2018**

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1 INTRODUCTION

1.1 Background Information

Eskom Holdings SOC Ltd (Eskom) is rebuilding an 88kV Powerline from Etna 275/88kV Substation looping In & Out of the Lehae Switching Station to Trade Route 88kV Substation. The project entails breaking down the existing 88kV powerline and building a new 88kV powerline due to the ageing nature of the existing infrastructure to also meet the requirements of City Power with their electricity demand in the area.

A total of three wetlands were recorded on the study site. All of these wetlands were classified as channelled valley bottom wetlands except for a non-perennial system (drainage lines) in the middle of the site. More wetlands not included in the assessment are located within the surrounding area. Another channelled valley bottom wetland not affected by the proposed alignment is located to the east of the R553. Two small artificial depressions one just south of the Trade Route substation (under construction) and one just to the south of the existing Etna substation (created by sand mining) are also located within the surrounding area.

The impacts that are anticipated to occur within and around the wetland crossings include clearing, destruction/degradation of natural vegetation, soil compaction and erosion, pollution, sedimentation and siltation of watercourses, alien invasions etc. This method statement therefore seek to address and advise of the environmental requirements that must be implemented when rebuilding within and around the wetland crossings. Please refer to Figure 1 from the Limosella Consulting Report - *Locality map showing the areas targeted for the Etna Trade Route 88kV Powerline rebuild.*

1.2 Technical input

Inputs from various Technical Specialists were considered during the compilation of this Method statement. Riparian and wetland delineations along the powerline route were undertaken by Limosella Consulting, 2016. The delineation was aimed at identifying the specific location of the pylons for the purposes of Water use License Applications (WULA) with the Department of Water Affairs (DWA). A Monitoring and Rehabilitation plan was also provided as part of riparian and wetland delineation study. Some of the conditions in the Monitoring and Rehabilitation plan were based on the Environmental Management Plan that was compiled by Nsovo Environmental (2016) for the powerline project.

It is of importance to review the abovementioned technical documents before implementing the method statements as some of these documents outline specific preparatory procedures that must be implemented beforehand. The Contractor must also compile a site specific risk assessment with every excavation and mono pole planted in close proximity of <500m from the edge of the wetland/watercourses. Such will assist the Contractor towards the prediction of potential impacts on the wetlands within the powerline thereby provide an appropriate mitigation plan to reduce the impacts.

1.3 Wetland and Surface Water Conditions

The wetlands identified by Limosella Consulting were noted to be highly impacted by pollution, erosion, loss of natural vegetation cover, increased sedimentation and high energy stormwater flows. These areas do however still form part of the hydrological network and should at all cost be protected from further degradation.

According to Limosella, these wetlands are noted to be heavily impacted on by a change in the catchment of the wetlands. The changes in the catchment due to roads, residential areas and other hardened structures as well as some mining and agricultural activities has led to a degradation of the watercourses delineated as well as a general increase in the velocity of water entering wetlands due to the surface roughness being decreased (Limosella Consulting, 2016). This in turn can lead to an increase in sediment and other foreign material input into the system. Pathways and roads act as a drain on wetlands where the water collects and flows more freely than the other parts of the wetlands.

Construction within the wetland or associated zones will negatively impact the wetland system although the intensity of the impact should be relatively small if the footprint of the infrastructure does not encroach onto the wetland area or its associated 30m buffer zone and mitigation measures are strictly applied. Given that mitigation measures are adhered to, no impact to downstream water resources are expected to result from the proposed development. It is important to note that a water use licence is required for any construction activities that take place within 500m of a wetland.

The rebuilding of powerlines is not a listed activity and will therefore not require an Environmental Authorisation. It must however be noted that some of the powerline infrastructure is located within 500m from existing wetland boundary and transect some watercourses. It is for such reasons that a Water Use Licence Application as per the Section

21(c –impeding or diverting the flow of water in a watercourse) and (i – altering the bed, banks, course or characteristics of a watercourse) of the National Water Act (Act 36 of 1998) will be required for some of the powerline sections located in close proximity to the wetlands.

The National Water Act (Act 36 of 1998) further requires that a Method Statement for activities occurring within 500m from a wetland be submitted with the Water Use Licence Application (WULA). This document constitutes a Construction Method Statement that must be implemented during the rebuilding of the powerline. All construction and reinstatement activities in the wetland buffer zone areas must comply in strict accordance to the Environmental Management Program and specific requirements from Department of Water & Sanitation.

1.4 Method Statement

The purpose of this document is to describe and define the general methodology that must be followed during the rebuilding of the powerline. It must be noted however that some

of the powerline infrastructure will be located outside the boundaries of the wetland including a 30 metre buffer zone and some will be located in close proximity to wetlands. The objective of this method statement is to ascertain that the rebuilding of the powerline and associated infrastructure is undertaken in a safe and environmentally responsible manner that will not significantly disturb the wetland ecological functioning.

The method statement will therefore cover procedures with regard to the general construction, rebuilding of powerlines and associated infrastructure within and about 500m away from the wetland. Activities with regard to the erection of towers and stringing of cables will also be considered in this Method Statement.

When working in a wetland, the area of work must be disturbed minimally and preserved as much as possible for the vegetation to be restored as fast as possible. Weather conditions such as wind, rain, lightning and dust may have a greater effect on the procedure and process of this activity.

1.5 Materials and Equipment to be used

The following plants are likely to be used during the construction/rebuilding of the powerlines:

- Excavators
- Graders
- Dozers
- TLB's
- Tipper
trucks
- Watercarts
- Mobile
crane

Please note that it is a recommendation in the Environmental Management Plan that no equipment shall be used which may cause irreparable damage to wet areas. The contractor

shall use alternative methods of construction in such areas that will not significantly affect the wetland. Such vehicles should not be parked near the wetland in order to prevent any spillages or leaks into a wetland environment.

1.6 Mitigation plan

The Contractor will provide a mitigation plan that will ensure that:

- All hazards and risks are identified
- Activities are properly identified
- All relevant PPE is correctly identified

- All records and documentation are identified, controlled, filed and maintained for the pre-determined period so that adherence to standard requirements can be demonstrated.

Once all this is identified, the environmental impacts on the nearby wetland is minimised and wetland functioning is not significantly modified. The rebuilding of the powerline infrastructure should be implemented taking in cognisance the following construction strategies and measures:

1.6.1 Health and Safety Requirements

The site and construction crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the Construction Regulations of 2014. All required PPE to be issued to all employees before starting with the task. All persons receiving PPE to sign register and are responsible to look after their PPE. Toolbox talk specific to task at hand to be discussed with all employees and Attendance Register signed and filed every morning for the duration of the task.

First Aid Box to be taken to site every day in case of an emergency, vehicles and cell phones with all emergency numbers will be visible and discussed to all employees in case of an emergency. All excavations not finished and left unattended to be barricaded and visible to all and the community before end of day.

1.6.2 General Mitigation measures within the wetland crossings

Detailed mitigation measures regarding the construction/rebuilding / erection of powerlines and towers are outlined in the Environmental Management Plan that was compiled by Nsovo Environmental and the Wetland and Rehabilitation plan compiled by Limosella Consulting. The following general measures should be implemented/noted during rebuilding of powerline:

- Contractors responsible for constructing the line rebuilds in close vicinity to wetland areas and along the route must sign a declaration stating that they will adhere to all stipulations of the Environmental Management Plan relating to wetland / stream crossings as well as measures as set out in the Wetland and Rehabilitation plan compiled by Limosella Consulting and the Surface Water Rehabilitation plan compiled by ECO Care Consultants.
- In order to limit the impact on the hydrology and ecosystem functioning of the area, a 30m buffer zone should be recognised from the edge of all the wetland and riparian areas.
- No equipment shall be used which may cause irreparable damage to wet areas. The contractor shall use alternative methods of construction in such areas.

Towers that may be located in wet areas should be removed and placed outside the edge of the temporary wet zones of the wetlands. The removal and rebuilding of the towers should ideally take place during the dry winter months reducing the potential impacts on the wetlands as well as associated secretive faunal species.

- The area of disturbance should be kept to a minimum to allow clearing of the construction right of way, excavation, layer works, construct concrete works, backfill, to restore the construction right of way. This should not exceed the construction footprint width must be kept to a minimum, and must avoid impact on the wetlands.

(a) Hydrocarbons and spill management

- All leaks and spillages must be addressed immediately and contained. Spillage kit to be on site on a daily basis. All leaks and spillages contained to be removed from site and disposed of to an authorised site
- All equipment and site vehicles to be inspected daily and recorded.
- No vehicles and equipment that have leaks such as diesel, grease and oils not permitted on site that can have a negative effect on the environment and even more hazardous working in a wetland.
- Site vehicles to be parked not near the wetland in order to prevent any spillages or leaks into a wetland environment.
- All site vehicles to be parked in designated area.

(b) Soil and Stockpile management

- A sequential construction strategy should be followed, i.e.
- Construction should be immediately followed by rehabilitation;
- Soils excavated in the wetland should be stored in sequence and not in the wetland perimeter ;
- Soils must be replaced in same sequence as excavated; and
- Soil surfaces should not be left open for lengthy periods to prevent erosion. Sods must be stored and placed back immediately after sub-soils have been backfilled.

(c) Stormwater management

The Storm water management must ensure that the anticipated construction activities, when adequately monitored, for the construction of the bases and foundations for the pylons on either side of the wetland crossings will not increase the site specific development run-off and hence adversely affect the watercourse in any way. The following measures based on the Stormwater Management and Wetland reports should be considered when rebuilding the powerline:

- Where feasible, construction activities on the watercourse crossings should be programmed for the drier winter months; Weather forecasts from the South African Weather Bureau of up to three days in advance must be monitored on a daily basis to avoid exposing soil or building works during a storm event;
- Site access roads to follow the natural contours of the land to avoid diverting/affecting the natural overland flow.

- Minimise the overall site footprint;
- The storage of materials on site must be minimised to avoid increasing the stormwater run-off;
- Temporary silt collection measures must be implemented prior to clearing the natural vegetation and stripping of topsoil for construction;
- Re-grassing and vegetation must be undertaken on completion of construction activities;
- Appropriate action must be taken in advance to protect construction works should a storm event be forecasted;
- Appropriate erosion and sediment control measures should be implemented. Sediment barriers should be constructed across the entire construction right of way at all watercourse crossings where necessary to prevent sediment flow into the watercourse;

(d) *Vegetation and soil management*

- The standard Eskom Guidelines for Erosion Control and Vegetation Management should be adopted for the purposes of managing stormwater during construction.
- Vegetation and soil should be retained in position for as long as possible, and should only be removed immediately ahead of construction / earthworks in any specific tower area;
- Remove only the vegetation/grass where essential to allow for the location of the towers. Do not allow any disturbance to the adjoining natural vegetation cover or soils.
- No access road must be constructed in a wetland. Should there be muddy ground within the strategic building site, all muddy ground will be removed and virgin soil placed and compacted to provide a firm and steady roadway for access to vehicles. Stones and rocks can also be used to compact the roadway.
- All concrete rubble and soil removed, to be discarded of at a municipal dumping site.

(e) *Material Delivery and Housekeeping*

- Material delivered by truck will be tied down and stacked correctly to be transported safely.
- Employees manual handling any material to use correct and all necessary PPE to avoid any lacerations or injuries.
- Employees use access ladder to climb up and down from side of truck.
- Any material offloaded from truck to be stacked neatly and correctly and recorded in a designated area not near monopole excavation site to prevent tripping and falling as no material to be lying around the work area. All material not used to be removed from site and stacked back at the lay down area.
- All construction vehicles and equipment, as well as construction material should be free of plant material. Equipment and vehicles should be thoroughly cleaned other prior to access on to the construction site;
- Material delivered to be inspected and free of oil, wet paint or any chemical that can be hazardous to the environment and a wetland area.
- Throughout any operation and at end of days' work housekeeping will be performed by using the appropriate PPE.
- When working in the wetland, the area of work must be left in such a way for the environment to be as it was before.
- All material, equipment, barricading to be removed from site back to the laydown area.

(f) Excavations by Plant Machinery and Hand Tools

- TLB and hand tools used to excavate to be inspected daily and recorded. Ensure that workers where and use the required PPE provided.
- When using a TLB, the operator must have a valid license and all required training.
- The operator shall inspect the TLB before any work is started and recorded on an inspection check sheet.
- When excavating with a TLB ensure that all bystanders are not within 5 metres from the machine and excavation.
- When excavating by hand no person may work alone in a excavation, there shall be at least 2 persons outside the area to render assistance in a event of soil collapse.
- Loose soil and gravel from the excavation shall be placed away from area of work.
- Workers to use step ladder to get access to bottom of hole.
- Any excavation left open shall have suitable barricading at least 1 metre high and as close to the excavation as possible.
- When excavating next to or close to road surface the necessary safety precautions must be taken:
 - Traffic signs
 - Barricading
 - Warning signs
 - Reflector
 - Vests

(g) Stringing

Stringing activities should take cognisance of the rehabilitation efforts and endeavour not to impact on the ongoing rehabilitation measures from tower erection, while monitoring during this phase is crucial. After stringing, the areas affected by stringing should be rehabilitated and the pylon footprint monitored. Additional procedures associated with stringing to be noted will include:

- All persons performing stringing will undergo a fall arrest training course, medical and psychological evaluation.
- A working at heights permit must be issued before the start of work.
- Prepare the conductor drums by placing them on the cable jacks and aligning them with the direction of draw.
- Stringing shall be done in daylight only.
- Feed guide rope over the cross arm and tie one end to conductor.
- Hang isolators and running blocks from tower cross arms.
- Thread pilot rope through running blocks.
- Draw conductor out from drums with a tractor or truck and leave excess to be able to do non tension string.
- Fit cable sock to conductor and tie rope to sock.
- Pull conductor over the goal posts using tractor or truck.
- Continue from tower to tower stringing conductor through eyes on insulators

(g) Material Handling (Storage and Disposal)

- No construction materials may be stored or disposed of within the delineated wetlands or within the buffer zone of 30 m from the wetlands. • No concrete batching may take place within the delineated wetlands or within the buffer zone of 30 m from the wetlands.
- No refuelling may take place within the delineated wetlands or within the buffer zone of

30 m from the wetlands

- All material must be removed to a designated area, or a licensed waste disposal facility, if it cannot be re-used.

1.6.3 Rehabilitation and Monitoring

All mitigation measures outlined in the Rehabilitation and Monitoring Plan compiled by Limosella Consulting in 2016 and the Surface Water Rehabilitation Plan must be used during the Rehabilitation of the site. In areas where construction activities have been completed and no further disturbance is anticipated, rehabilitation and re-vegetation should commence as soon as possible and must include but not limited to the following:

- Frequent monitoring inspections must be done to evaluate the sites for signs of pollution, erosion and alien plant invasions. Regular monitoring and mitigation are important aspect to lower possible impacts.
- Access roads to remove existing structures must be restricted in wetland areas and buffers. Only use access as designated during the planning phase.
- Temporary rehabilitation must be implemented to prevent loss of topsoil and invasion by alien invasive plant species between removal of existing structures and construction of new structures, and monitoring of vegetation growth thereafter;
- Where the new structures will not utilise the existing footprint, rehabilitation should take place immediately after the removal of structures,
- Stripping of vegetation for construction must occur in a phased manner and must be restricted to the tower footprint to reduce the risk of erosion during times of precipitation
- Re-vegetation of disturbed areas must be undertaken with indigenous species and in accordance with the instructions issued by the Environmental Control Officer (ECO).
- Stringing activities should take cognisance of the rehabilitation efforts and endeavour not to impact on it, while monitoring during this phase is crucial. After stringing, the areas affected by stringing should be rehabilitated and the pylon footprint monitored.
- Replanting activities should be undertaken at the end of the dry season (middle to end September) to ensure optimal conditions for germination and rapid vegetation establishment;
- Should plants not successfully establish within two growing seasons after the first planting, new plant material should be provided;
- It must be noted that other areas within the servitudes are overgrown by weeds and other exotic plant species. Any weed or alien species that germinates during the rebuilding should be cleared by hand before flowering.
- Any erosion channels developed during the construction period should be appropriately backfilled (and compacted where relevant) and the areas restored to a condition similar to the condition before the construction erosion occurred.