

## REVEGETATION AND REHABILITATION PLAN

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### 1. PURPOSE

The purpose of the Revegetation and Rehabilitation Plan is to ensure that areas cleared or impacted during construction activities within the development corridor for the grid connection infrastructure, and that are not required for operation are rehabilitated to their original state before the operation phase commences, and that the risk of erosion from these areas is reduced. The purpose of the Rehabilitation Plan for the development footprint (i.e. power line servitude, collector substation and access roads) can be summarised as follows:

- » Achieve long-term stabilisation of all disturbed areas.
- » Re-vegetate all disturbed areas with suitable local plant species.
- » Minimise visual impact of disturbed areas.
- » Ensure that disturbed areas are rehabilitated to a condition similar to that found prior to disturbance.

This Revegetation and Rehabilitation Plan should be read in conjunction with other site-specific plans, including the Erosion Management Plan, Soil Management Plan, Alien Invasive Management Plan and Plant Rescue and Protection Plan. Prior to the commencement of construction, a detailed Revegetation and Rehabilitation Plan and Method Statement for the site should be compiled with the aid of a suitably qualified, professionally registered specialist (with a botanical or equivalent qualification).

### 2. RELEVANT ASPECTS OF THE SITE

The vegetation of the project site is located within the Nama-Karoo Biome and the Bushmanland and the West Griqualand Bioregion. The vegetation types covering the broader study area within the vicinity of the Bushmanland Arid Grassland and the Kalahari Karroid Shrubland Vegetation type which is very limited in extent within the study area, as it is only found within the south-western corner of the study area.

According to Mucina and Rutherford (2006), the Bushmanland Arid Grassland vegetation type in this area is dominated by *Stipagrostis*, *Enneapogon*, *Eragrostis* and *Schmidtia* grass species. Furthermore, a variable density of shrub species within the study area from this vegetation type can be found. These include: *Acacia mellifera*, *Rhizogum trichotomum*, *Boscia foetida subsp. foetida*. Kalahari Karoo Shrubland species include, the *Pentzia*, *Aptosimum*, *Pteronia* and *Salsola* dwarf shrub species.

Five (5) vegetation habitats are identified within the project site for the solar PV facility and the associated infrastructure and are described below:

#### *Ziziphus mucronata* – *Cenchrus ciliaris*

This habitat is associated with deep, coarse sand substrate that becomes loamy in certain areas of the project site. Large outcrops of rocks are exposed within this habitat along embankments. This habitat is of high conservation significance and is associated with the species *Boscia albitrunca*, *Vachellia erioloba*, *Searsia pendulina*, *Ziziphus mucronate*, *Stipagrostis ciliata*, and *S. uniplumis*.

#### *Rhigozum trichotomum* – *Barleria lichtensteiniana*

This habitat is associated with riparian shrubland of the ephemeral washes/drainage lines. The vegetation is associated with channels that overlie calcrete. The habitat is associated with the species *Vachellia erioloba*, *Boscia foetida*, *Stipagrostis ciliata*, *S. uniplumis*, *Boscia foetida* and *Vachellia erioloba*.

*Ziziphus mucronata* – *Lycium oxycarpum*

This habitat is associated with the vegetation of the depression freshwater features within the project site. Plant species associated with this habitat include: *Ziziphus mucronata*, *Senegalia mellifera*, *Lycium bosciifolium*, *L. oxycarpum*, *Geigeria pectidea*, *Lycium cinereum*, *Amellus tridactylus*, *Platycarpha carlinoides*, *Moreae polystachya*, *Eragrostis annulata*, *E. porosa*, *Chloris virgata*, *Selago dinteri* and *Berkheya spinosissima*

*Senegalia mellifera* – *Stipagrostis uniplumis*

This habitat is associated with gravel areas exposed on the project site. Plant species associated with this habitat include: *Rhigozum trichotomum*, *Senegalia mellifera*, *Boscia foetida*, *Enneapogon cenchroides*, *Eragrostis lehmanniana*, *E. trichophora*, *Stipagrostis ciliata*, *S. uniplumis*, *Aristida stipitata*, *Geigeria ornativa*, *Monechma divaricatum*, *Blepharis mitrata*, *Cleome spp.*, and *Aptosimum lineare*

*Zygophyllum chrysopteron* – *Enneapogon scaber*

This plant habitat is associated with dwarf shrub species within the project site. The species are associated with exposed areas of gravel within the project site. Plant species associated with the habitat include: *Rhigozum trichotomum*, *Leucosphaera bainesii*, *Eriocephalus merxmuelleri*, *E. asphalathoides*, *Acanthopsis disperma*, *Salsola armata*, *Enneapogon scaber*, *Stipagrostis obtusa*, *S. uniplumis*, *Oropetium capense*, *Anacampseros abissima*, *Kleinia longiflora*, *Euphorbia spinea*, *Zygophyllum chrysopteron*, *Z. leptopetalum*, and *Monechma divaricatum*,

### **3. REHABILITATION METHODS AND PRACTISES**

The following general management practices should be encouraged or strived for:

- » Clearing of invaded areas should be conducted as per the Alien Management Plan, included in the EMPr.
- » No harvesting of vegetation may be undertaken outside the area to be disturbed by construction activities.
- » Indigenous plant material must be kept separate from alien material.
- » Indigenous seeds may be harvested for purposes of revegetation in areas that are free of alien invasive vegetation, either at the development footprint (i.e. power line servitude, access roads and collector substation) prior to clearance or from suitable neighbouring sites.
- » Topsoil should be reserved wherever possible on site, to be utilised during rehabilitation.
- » Sods used for revegetation should be obtained directly from the site, but not from the sensitive areas. Sods should contain at least a 50 mm topsoil layer and be minimally disturbed, in particular to existing root systems. Sods must ideally be obtained from areas as close as possible to the region that is to be rehabilitated.
- » Water used for the irrigation of re-vegetated areas should be free of chlorine and other pollutants that might have a detrimental effect on the plants.

- » All seeded, planted or sodded grass areas and all shrubs or trees planted are to be irrigated at regular intervals.
- » On steep slopes and areas where seed and organic matter retention is low, it is recommended that soil savers are used to stabilise the soil surface. Soil savers are man-made materials, usually constructed of organic material such as hemp or jute and are usually applied in areas where traditional rehabilitation techniques are not likely to succeed.
- » In areas where soil saver is used, it should be pegged down to ensure that it captures soil and organic matter flowing over the surface.
- » The final rehabilitated area should resemble the current composition and structure of the soil as far as practicably possible.
- » Progressive rehabilitation is an important element of the rehabilitation strategy and should be implemented where feasible.
- » No construction equipment, vehicles or unauthorised personnel should be allowed onto areas that have been rehabilitated.
- » Where rehabilitation sites are located within actively grazed areas, they should be fenced off, this must be undertaken in consultation with the landowner.
- » Any runnels, erosion channels or wash-aways developing after revegetation should be backfilled and consolidated and the areas restored to a proper stable condition.
- » Re-vegetated areas should be monitored frequently and prepared and revegetation from scratch should inadequate signs of surface coverage or growth be evident after two growth seasons. Adequate recovery must be assessed by a qualified botanist or rehabilitation specialist.
- » The stockpiled vegetation from the clearing operations should be reduced to mulch where possible, and retained along with topsoil to encourage seedbank regrowth and soil fertility.
- » Mulches must be collected in such a manner as to restrict the loss of seed.
- » Mulch must be stored for as short a period as possible.
- » Mulch is to be harvested from areas that are to be denuded of vegetation during construction activities, provided that they are free of seed-bearing alien invasive plants.
- » Where herbicides are used to clear vegetation, species-specific chemicals should be applied to individual plants only. General spraying should be strictly prohibited, and only the correct herbicide type should be applied.
- » Once rehabilitated, areas should be protected to prevent trampling and erosion.
- » Fencing should be removed once a sound vegetative cover has been achieved.

#### **4. MONITORING AND FOLLOW-UP ACTION**

The following are the minimum criteria that should be monitored:

- » Associated nature and stability of surface soils.
- » Re-emergence of alien and invasive plant species. If noted, remedial action must be taken immediately, as per the alien management plan and mitigation measures contained within the EMPr.

Rehabilitation success, monitoring and follow-up actions are important to achieve the desired cover and soil protection. The following monitoring protocol is recommended:

- » Rehabilitation areas should be monitored every 4 months for the first 12 months following construction, or as per the recommendations of specialist.

- » Ensure that steep slopes are not de-vegetated unnecessarily and subsequently become hydrophobic (i.e. have increased runoff and a decreased infiltration rate) increasing the erosion potential.
- » Soil loss is related to the length of time that soils are exposed prior to rehabilitation or stabilisation. Therefore, the timeframe between construction activities and rehabilitation should be minimised. Phased construction and progressive rehabilitation, where practically possible, are therefore important elements of the erosion control and rehabilitation strategy.
- » Any areas showing erosion, should be adaptively managed with particular erosion control measures, depending on the situation.

If the current state of the environment prior to construction (which will be disturbed during the construction phase) is not achieved post impact, within the specified rehabilitation period, maintenance of these areas must continue until an acceptable state is achieved (excluding alien plant species or weeds). Additional rehabilitation methods may be necessary to achieve the current state before construction commenced.

Monitoring of the rehabilitation success, as well as follow-up adaptive management, combined with the clearing of emerging alien plant species should all continue for as long as is considered necessary, depending on regrowth rates.