Specialist report:

Proposed 132 kV Soekmekaar-Mashau power line from the Soekmekaar substation to the Singo substation and the power line between the Singo and Mashau substations.

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INTRODUCTION:

Project Description:

The brief for the project supplied by Eskom are:

- Construction of the new substations at the proposed Singo site and the proposed Mashau site.
- Construction of the 132 kV power line between the existing Soekmekaar substation and the new Singo substation.
- Construction of the 132 kV power line between the new Singo substation and the new Mashau substation

Project Locality:

The project in the Limpopo Province is between Soekmekaar and Thohoyandou (Figure 1).

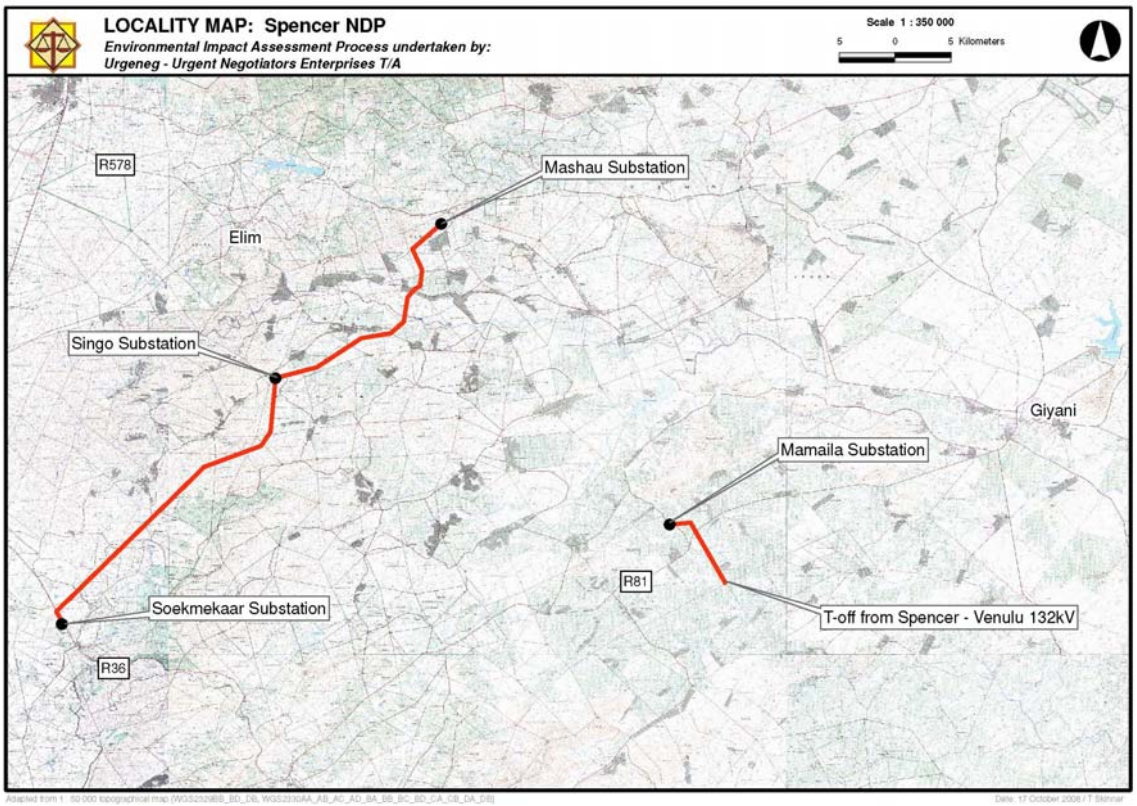

Figure 1: Map showing the study area for the project.

ASSUMPTIONS AND LIMITATIONS:

Availability of baseline information:

Baseline information about the plant community of the site was obtained from Mucina and Rutherford (2006). The desktop survey provided adequate baseline information for the area and therefore this was not a constraint.

Constraints:

The survey was conducted on 14 - 16 August and 14 -16 September 2008 during daytime only. The study area is stretched out over a large area and access to all areas is not always possible. All the different habitats at the site was investigated and it was therefore possible to complete a rapid survey and obtain information on the biological community (excluding avifaunal) that are present and the site, or that are likely to occur there.

Bio-physical constraints:

Weather conditions during the period was cool (approximately 19 ºC in August and approximately 22 ºC during September), with a mild wind blowing. It seems that the region has received a little rainfall prior to the site visit as the vegetation was still dry and sparse. There was no standing water was present away from the rivers and in some of the streams a few stagnant pools were present. This will have obvious implications on the biodiversity that are likely to occur in the area. Nevertheless, the conditions during the survey were ideal for a survey of this nature.

Confidentially constraints:

There were no confidentially constraints.

Implications for the study:

Apart from the prevailing weather conditions at the site, there were no other significant constraints that would negatively impact upon the study. There is sufficient good quality data available in the literature that partially negates the negative effect that the type of survey had on the quality of the assessment.

METHODS

Desktop study:

Prior to the site visit and field survey, ESKOM provided the specialists with an aerial photograph of the study site and briefed us on the scale and extent of the project. The appropriate 1:50 000 was used to identify the major habitat features such as roads, railways, drainage channels, old cultivated fields, wooded areas, wetlands, ridges etc. Prior to the site visit, a desk top study was conducted to generate lists of species historically recorded at or near the site, or that are likely to occur at the site.

Field survey:

The field survey was planned to include all the different habitat types and to target threatened species that may occur in the area, to determine the likelihood of their presence and how the proposed activities will impact upon them.

During the survey, a walk-about was conducted to determine the areas for the new substations and the proposed associated power lines. All activity of animals was noted and a general plant list was completed. Due to the time constraint, a full survey of plants was not possible. Photographs of important features were taken and will be included in the report. Addendum 1 is a list of the red data species supplied by SANBI (2008) and only include the plants listed as vulnerable, rare or endangered.

Vegetation:

The vegetation type is known as the Makhado Sweet Bushveld (SVcb 20) and the Tzaneen Sour Bushveld (SVl 8) (Mucina and Rutherford, 2006) (Figure 2-4). Earlier it was known as the Mixed Bushveld (Acocks, 1953) or Mixed Bushveld and Sweet Bushveld (Low and Rebelo, 1996) and the Lowveld Sour Bushveld (Acocks, 1953) or Sour Lowveld Bushveld (Low and Rebelo, 1996).

The Makhado Sweet Bushveld is distributed from the Soutpansberg to the Waterberg areas at an altitude between 850 and 1 200m. The area is dominated by slight to moderate undulating plains generally sloping towards the north. Some hills occur in the southwest and the area is covered by short shrubby bushveld with a poorly developed grass layer (Mucina and Rutherford, 2006).

The Tzaneen Sour Bushveld extends in a band along the foot slopes of the northeastern escarp, from the Soutpansberg to the Transvaal Drakensberg and the altitude range between 600 and 1 000 m (Mucina and Rutherford, 2006).

Geology and soils:

For the Makhado Sweet Bushveld, the migmatites and gneisses of the Hout River Gneiss and Goudplaats Gneis are dominant formations. Some sandstones and mudstones of the Matlabas Subgroup are found and soils include deep, grayish sands, eutrophic plinthic catenas, red-yellow apedal freely drained soils and clays in the lower areas (Mucina and Rutherford, 2006). In the case of the Tzaneen Sour Bushveld, the potassium-poor gneiss of the Godplaats gneiss and Archaean granite dykes underlie most of the area. Soils are dominated by Hutton, Mispah and Glenrosa and vary from shallow to deep, sandy to gravel and are mostly well drained (Mucina and Rutherford, 2006).

Climate:

Both the areas are a summer rainfall area with dry to very dry winters. The annual MAP varies between 350 and 550 mm for the Makhado Sweet Bushveld to 550 and 1 000 mm for the Tzaneen Sour Bushveld. In both veld types, frost is infrequent but may occur occasionally at the higher altitudes of the escarp. The mean maximum and minimum temperatures vary between 36.5° C and -0.8° C across the study area (Mucina and Rutherford, 2006).

Conservation:

Although the Makhado Sweet Bushveld is an extensive veld type, it is considered to be vulnerable and only 1% of the targeted 19% has formal protection. About 27% is transformed, mainly by cultivation and urban areas (Mucina and Rutherford, 2006). Various exotic invaders are present and include *Melia azedarach* and *Opuntia ficus-indica*. Erosion potential is high to moderate and of serious concern in the area.

The Tzaneen Sour Bushveld is considered as endangered by Mucina and Rutherford (1996) and less than 3% of the targeted 19% is formerly conserved. About 41% is transformed with 9% under exotic plantations and 29% under cultivation. Exotics that impact severely include *Solanum mauritianum, Melia azedarach* and *Caesalpinia*

decapetala with *Chromolaena odorata, Lantana camara* and *Psidium guajava* problematic in the more subtropical areas. Erosion is variable and range from low to high across the study area and this apply especially to the steeper slopes associated with the undulating landscape.

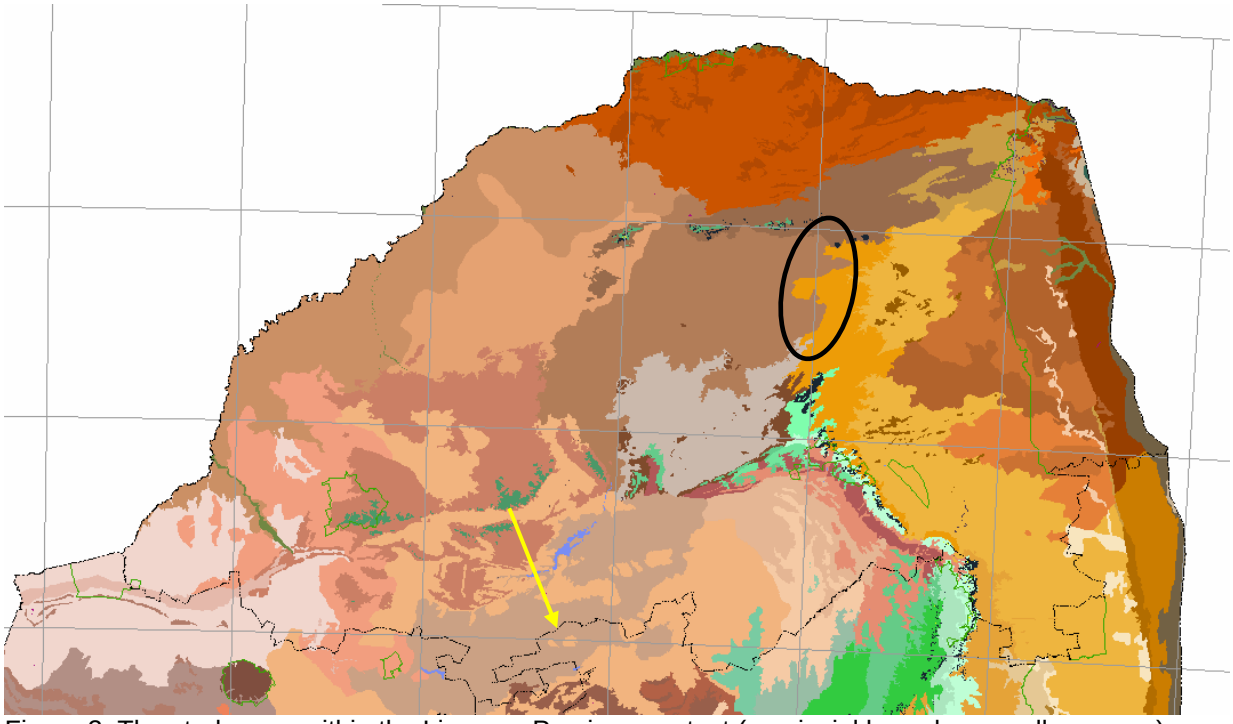

Figure 2: The study area within the Limpopo Province context (provincial boundary = yellow arrow).

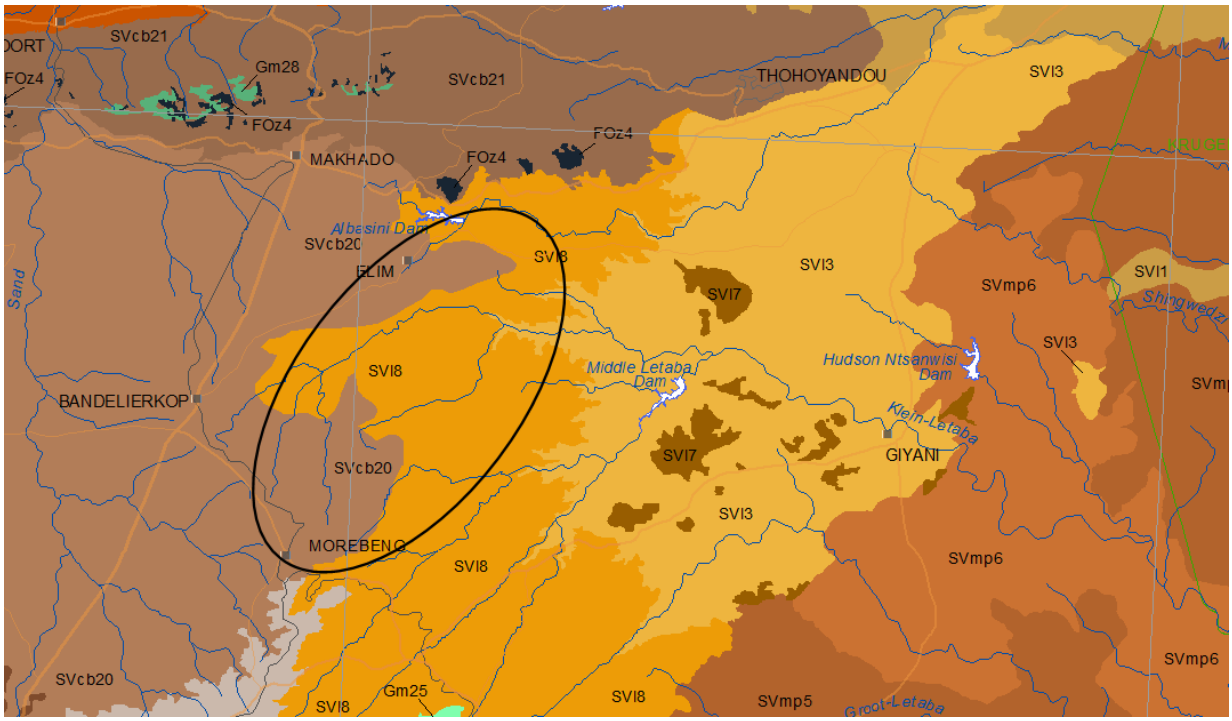

Figure 3: The study area at regional scale.

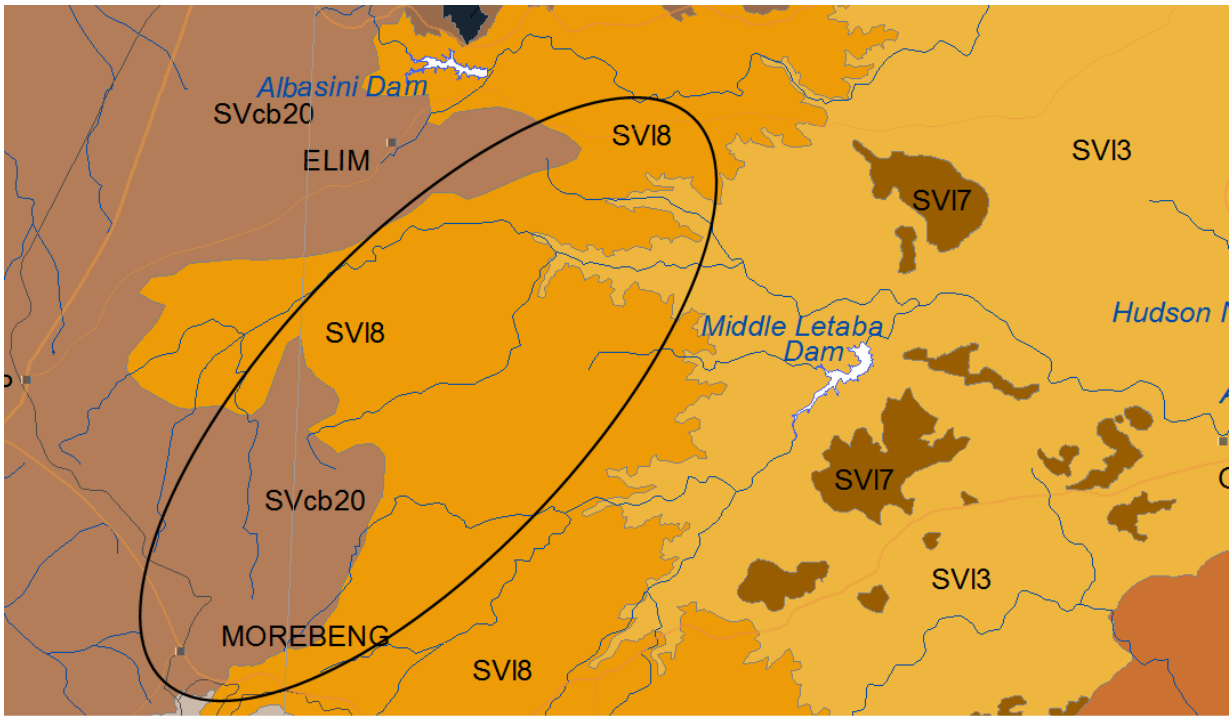

Figure 4: The study area at local scale.

RESULTS AND DISCUSSION

The whole area that was investigated is dominated by undulating landscapes and therefore many streams and rivers are present. This has the implication that many sensitive areas are present, but due to the large number of these, certain areas rather than each stream will be highlighted.

Soekmekaar substation (farm Haasbult 518) to the road crossing near Muila (farm Minnaarsdraai 1177)

Just north of the Soekmekaar/Morebeng substation (on the R36), a deep valley cross the servitude and this area is considered as a sensitive zone (Figure 5 and 11). When constructing the new power line, care must be taken to prevent any erosion. As indicated earlier, these steep slopes have a high erosion potential. Between the river and the substation the trees are cut for fire wood and the veld is dominated by low shrubs and small trees (< 3m) (Figure 11). A few large *Sclerocarya birrea* are present in the area and depending on the final route, some may need trimming or cutting (permits needed, as it is a protected species).

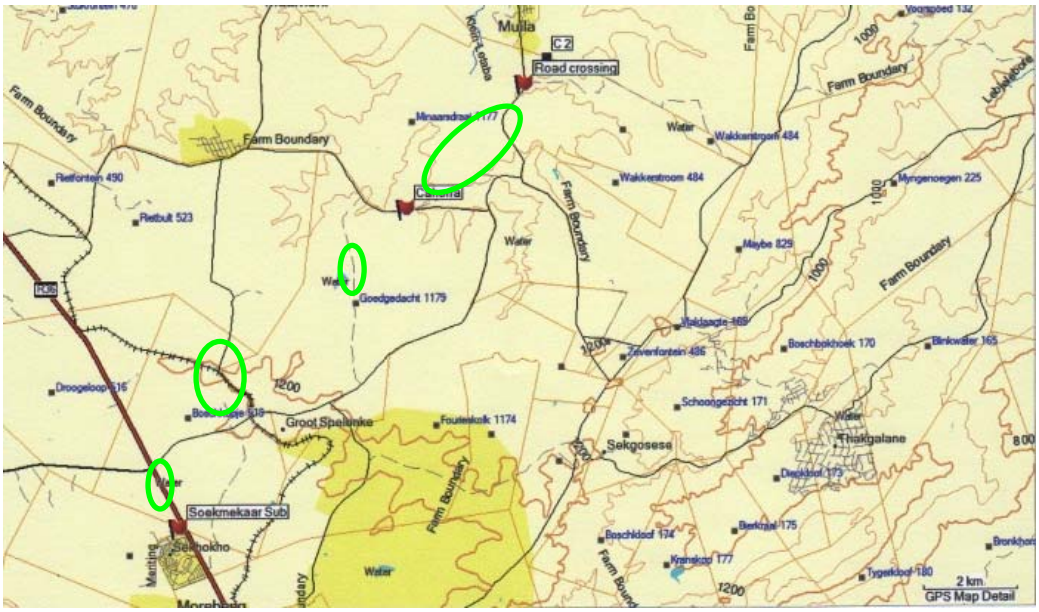

Figure 5: Sensitive areas between the Soekmekaar substation and the road crossing near Muila.

The streams in the area are all the headwaters for the Klein Letaba River and drain in a northerly direction. Once the final route is known, each of the crossings must be mapped to ensure that the necessary protection is ensured in the long term. The current servitude of the Cahorra Basa power line must be used as the main access

route to this part of the project (Figure 12). This will ensure that impact to the environment is limited. This will ensure that the clearing and trimming of trees will be restricted only to those that are impacting on the new power line.

Muila road crossing (farm Minnaarsdraai 1177) to the river crossing (farm Setau 123)

This section of the proposed route for the new power line is very undulating with sections with very steep valleys (Figure 6 and 13). As with the previous section, it is important to use the existing servitude road along the Cahorra Basa power line as the main access for the new power line (Figure 12). In some cases it might be necessary to prevent the crossing of some of the valleys and it is suggested that stringing is done from the air. Once the final route is approved, it is suggested that these very sensitive areas are mapped with ESKOM to ensure that the best practices are followed to limit the impacts to the environment. Here the proposed line crosses the headwaters (Seoketse River) of the Klein Letaba River (Figure 14).

Figure 6: Section of the route between the road crossing at Muila and the river crossing on the farm Setau. The area is dominated by deep valleys and gorges and is important for the water supply to the Klein Letaba River.

River crossing (farm Setau 123) to the Singo substation (farm Weltevreden 118)

The section from the Seoketse River to where the line passes the village on the farm Geraldine 119 is in a narrow gorge and this is the most sensitive section (Figure 7 and 15). The current servitude along the Cahorra Basa power line is suggested as the

preferred access road and this will limit impacts in the area. Many small gulleys and valleys must be crossed, but with good planning the negative impacts can be low.

Of concern in this area is the uncontrolled wood cutting taking place (Figure 16). Many roads are cut open and wood is cut from the steep slopes leaving it exposed and vulnerable to accelerated erosion (Figure 17).

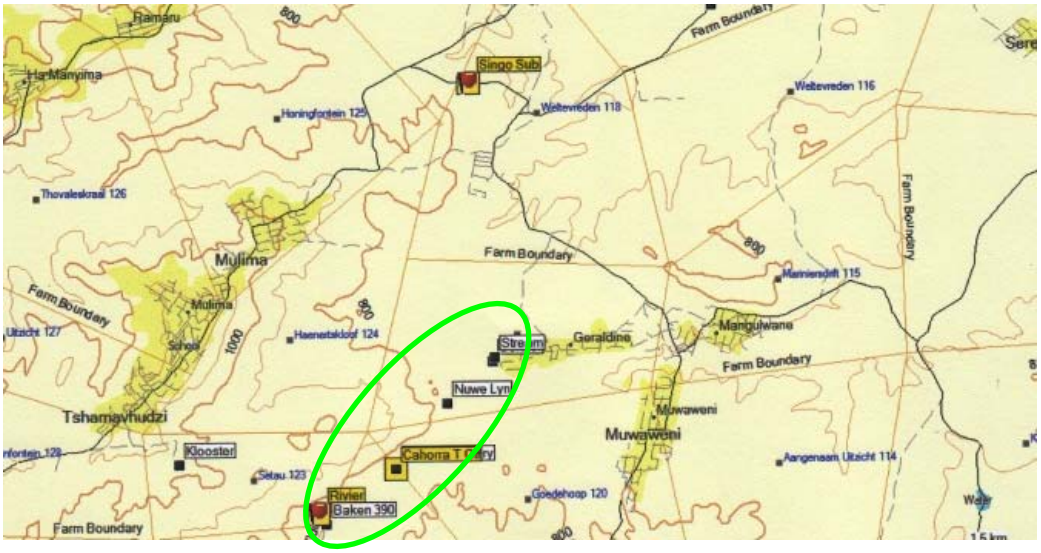

Figure 7: Map of proposed route between the river and the Singo substation.

Just before the proposed sites for the Singo substation there are koppies and the line will pass between the village and the koppies. The line must pass are far as possible to the east of the koppies as this area is also considered as a sensitive area (Figure 18). There is little difference between the two proposed sites, one to the north of the road and the other to the south of the road.

Singo substation to the farm Kruisfontein 48

The first section of the route is near the crest of the landscape and care must be taken to prevent future erosion (Figure 19). The slopes towards the Nwandi River is fairly steep and the area will be prone to moderate to high erosion if the soils are exposed. The area is also under large scale subsistence cultivation (Figure 20). The proposed route crosses the Nwandi River a few times and in places the river has steep banks, therefore the existing road and river crossings must be used (Figure 8 and 21). The road cross the river on the farm Nooitgedacht 90 and here the current crossing is the preferred area to use for the new power line. Near the village of Ha-Mashamba (farm

Riversdale 75) the Nwandi River meanders and forms a wide floodplain (Figure 22). This area is sensitive and specific attention must be paid to this area during the final planning of the route for the new proposed power line. Just to the northeast of Ha-Mashamba, the new power line will cross the Klein Letaba River (Farm Thorndale 73). Again, the meandering nature of the river causes it to form a wide flood plain area that must be considered as sensitive (Figure 22).

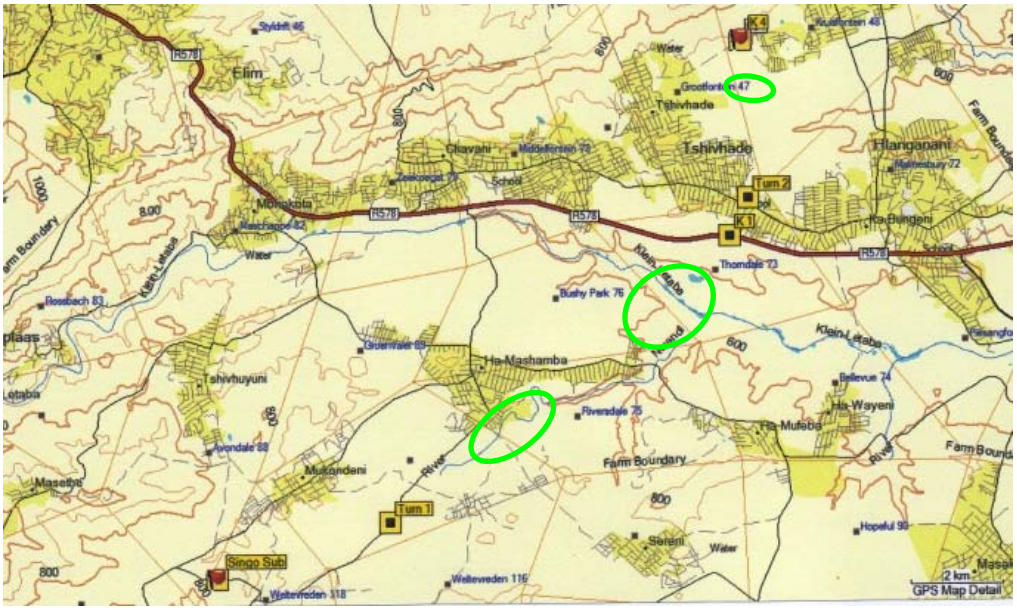

Figure 8: Section of the route between Singo substation and the farm Kruisfontein.

The power line can pass the koppie to the north of the Russel-Bungeni High School in Tshivade. The old reservoirs on the koppie (S 23˚ 12.057 E 30˚ 12.057) will not be a problem (Figure 23) and the power line can then pass the new grave yard (along the corridor) to the north of the koppie (Figure 24). The Shikari River between the koppie (turn 2 – Figure 8) and the K 4 (Figure 8) must not be crossed with any vehicles (Farm Kruisfontein 48). The banks of the river are steep and will result in serious erosion, already evident in the area (Figure 25).

Section from the road crossing (K 4) on the farm Kruisfontein 48 to the Mashau substation

From the road crossing (K 4 – figure 9) there are some deep valleys (Figure 9 – green circle) and good planning is needed with the final placing of the structures. The area is extensively cultivated by subsistence farmers (Figure 26). Care must be taken to limit

vehicle traffic during the construction phase. The soils in this area are prone to erosion (potential in the area very high).

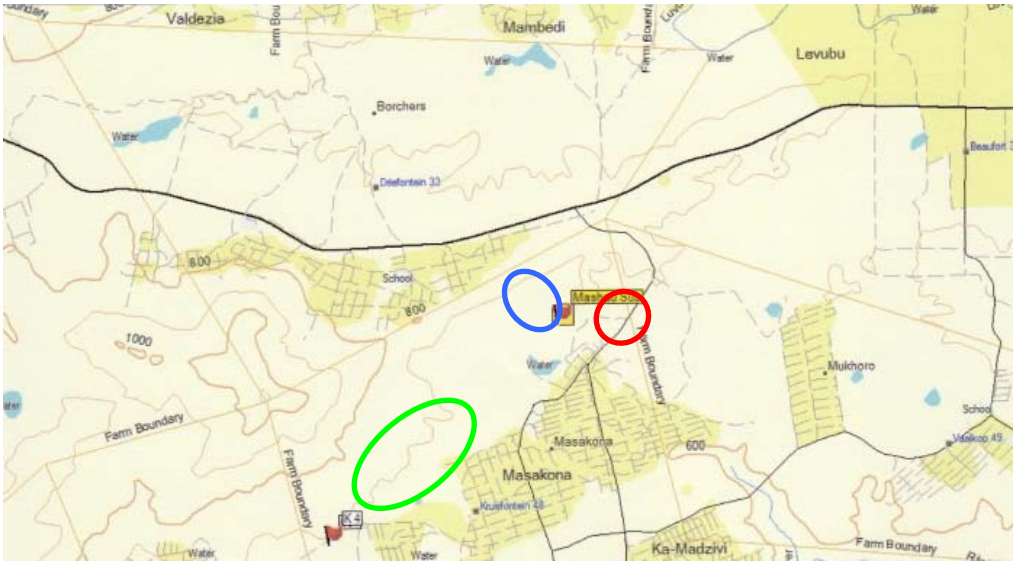

Figure 9: The study area between the road crossing (K 4) and the Mashau substation.

Two sites are proposed. The first site is nearest the access road and the construction road will cross through a deep gully next to the road. The bridge connecting the village to the tar road is damaged and care must be taken to limit erosion during the construction period (Figure 9 – red circle). Secondly, a rehabilitation strategy must be in place to repair any damage to the environment once the construction is completed.

The second site is further west from the access road (Figure 9 – blue circle). There is no properly constructed road to the site and this must be done before construction can commence. There is some gullies between the access road and the construction site and measures must be in place to lower the risk of erosion during the construction phase. Once construction ceases, the road and river crossings must be rehabilitated.

Conclusions

Although one can identify various issues with a project of this magnitude, it is clear that the large number of rivers and streams in the area rank as the most important aspects. The terrain in general very undulating and is within the important catchment of the Klein Letaba River. The soils in the area are considered to be prone to erosion, especially on the steeper slopes. Once the final route and positions of substations sites are determined, the sensitive areas can be visited to ensure that all parties

(ESKOM, contractors and consultants) are aware of the specific actions that must be taken. This can then be pointed out to ensure no problems occur during construction. Erosion and pollution can be a problem, both during construction and after the project is completed. Oils and fuel spills can have a medium to high impact in the rivers if no proper plan to contain possible spills or clean-up strategy is not in place. Cattle and humans depend in many areas on the natural resource for drinking water. Erosion will have a less devastating impact (short term), but in the long term more severe impacts on aquatic macro-invertebrates and fish can occur. This, with possible pollution from sewerage can be contained and managed. Proper ablution facilities during construction must therefore be in place.

It is suggested that the existing servitude of the Cahorra Basa power line must be used as the access road to the proposed new power line. This servitude is already cleared of most of the large trees and very little removal of indigenous trees will be needed.

This will ensure that the impacts on the environment will be lowered. Once the final route is known and pegged, it will be necessary to capture the specific sensitive river and streams crossings. This must be done in conjunction with the ESKOM officials and the appointed contractors to ensure that the best options with regard to river crossings and construction procedures are followed.

The plant community in most rural village areas are severely modified (local and regional impact very low). The section from the Seoketse River to the village on the farm Geraldine is in the most pristine condition along the route. Clearing of the vegetation for the servitude will be low on a local scale (addendum 1) with a negligible impact on a regional and national level. Of concern is the illegal removal of large quantities of wood, especially on the farms Setau 123 and Goedverwacht 121. Many roads are cleared in the area and large quantities of cut wood are removed.

Some large trees were observed. Very little protected trees are in the proposed corridor and include *Sclerocarya birrea* and *Boscia albitrunca*. The area between the Seoketse River and Geraldine however has a few large trees that will need cutting and/or trimming. Some large trees were also observed in the proposed corridor near

Tshivhade, including *Sclerocarya birrea.* It is suggested that a final tree survey is conducted once the final route is finalised. The trees that are protected will be marked and mapped with the aid of a GPS and then the necessary permits for cutting and trimming can be acquired.

Addendum 2 is a summary of the issues observed and give a list of mitigating and management options.

Figure 10: View of river just north of the sub.

Figure 11: View from Soekmekaar substation. Open with low shrubs and trees.

Figure 12: View of existing servitude.

Figure 13: The terrain in general very undulating.

Figure 14: The undulating landscape and Seoketse River arrow on farm Setau.

Figure 15: Undulating terrain and gorge to follow to Singo substation.

Figure 16: Large-scale wood collection.

Figure 17: Erosion on roads to wood collection areas.

Figure 18: Koppie and village – sensitive area.

Figure 19: Undulating landscape – near crest of watershed.

Figure 20: Large scale subsistence cultivation.

Figure 21: The steep banks of the Nwandi River.

Figure 22: Floodplains (red line) associated with rivers (arrow).

Figure 23: Reservoirs with possible site for structure in foreground.

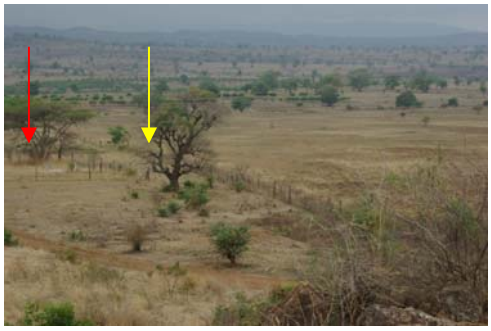

Figure 24: Grave yard (red arrow) and corridor (yellow arrow).

Figure 25: Shikari River with steep banks – high erosion potential.

Figure 26: Undulating landscape near the Mashau substation.

Figure 27: View from sub site towards ridge to cross (arrow).

Addendum 1: List of possible red data species that may occur in the study area (SANBI, 2008). The list only includes vulnerable, rare and endangered species.

Status	**Genus and species name**
VU	*Rhynchosia vendae*
Rare	*Freylinia tropica*
VU	*Jamesbrittenia bergae*
Rare	*Freylinia tropica*
VU	*Cyphostemma hardyi*
EN	*Argyrolobium muddii*
Rare	*Brachystelma inconspicuum*

Addendum 2: List of impacts and suggested mitigating and management strategies.

Soekmekaar/Mashau project		
Theme	**Natural environment**	
Nature of issue	Erosion	
Stage	Construction and maintenance	Possibility for erosion during construction possible due to soil types and slopes in the area.
Extent of impact	Site and local	
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be high.
Probability of occurrence	High	Must be managed on daily basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Marginal.	If no maintenance is done, the impact will have a compounding impact on the environment.
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Limited traffic during construction. • Constant rehabilitation during construction. • Must have maintenance strategy as part of EMP.	
Level of significance after mitigation	Low.	
EMP requirements	• No surface storm water generated as a result of the development may be directed directly into any natural drainage system or wetland. • A comprehensive surface runoff and storm water management plan, indicating the management of all surface runoff generated as a result of the development (during both the construction and operational phases) prior to entering any natural drainage system or wetland, must be submitted (e.g. storm water and flood retention ponds). • In order to minimise artificially generated surface storm water runoff, total sealing of paved areas such	

	as parking lots, access roads, pavements and walkways should not be permitted. Permeable material should rather be utilized for these purposes. In addition, runoff rain water from all roofs must be managed to prevent erosion. • Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. In order to prevent erosion, mechanisms are required for dissipating water energy. • No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted during the construction phase. • An on site ecological management plan must be implemented for rivers and wetlands including management recommendations as well as potential rehabilitation of severely disturbed areas.	
Nature of issue	Construction – material, by products and construction sites.	This includes accommodation, storing of material and ablution facilities for all workers during construction. It is recommended that no workers stay on the construction sites (sub stations) at any time.
Stage	Construction and maintenance	Must have a strict environmental guidelines and management plan in place before clearing and construction can commence.
Extent of impact	Site and local	
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be high.
Probability of occurrence	High	Must be managed on daily basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Marginal.	If no maintenance is done, the impact will have a compounding

		impact on the environment.
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Proper ablution facilities on site. • Constant rehabilitation during construction. • Must have rehabilitation strategy as part of EMP.	This refers to storage of material, oil and fuel spills, ablution facilities and rehabilitation of construction sites at the completion of the project.
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• During the construction phase, workers must be limited to areas under construction and access to neighbouring undeveloped areas must be strictly regulated, preventing uncontrolled hunting and poaching and gathering of firewood and medicinal plants. In this regard it is recommended that the conserved open natural areas are pointed out and maintained as no-go areas. • Construction should be limited to the daylight hours preventing disturbances to the nocturnal activities of certain species and nearby human populations. • Weeds and invasive vegetation should be removed prior to construction activities preventing spreading into newly disturbed areas or areas cleared of vegetation. Alien vegetation removal will continue through all phases of the development especially in the conserved open spaces and buffer zones. • All temporary stockpile areas, litter and rubble must be removed on completion of construction. All dumped material must be taken to an approved dump site in the area. • Soil stockpiling areas and storage facilities must follow environmentally sensitive practices and be situated a sufficient distance away from drainage areas or drainage line. • The careful position of soil piles, and runoff control, during all phases of development, and planting of some vegetative cover after completion (indigenous groundcover, grasses etc.) will limit the extent of erosion occurring on the site.	

	• Vegetation plays a critical role in the hydrological cycle by influencing both the quantity and quality of surface run-off. It influences the quantity of run-off by intercepting rainfall, promoting infiltration and thus decreasing run-off. Vegetation can influence water quality in two ways: by binding soils thus protecting the surface layer, and by intercepting surface run-off thus buffering rivers and wetlands against suspended and dissolved substances. When the speed of the run-off is reduced, suspended particles can settle out and dissolve substances, such as nutrients, can be assimilated by plants. The vegetation has a filtering effect.	
Nature of issue	Pollution	Includes oil and fuel spills, erosion, storage of by-products and ablution facilities.
Stage	Construction and maintenance	Must have a strict environmental guidelines and management plan in place before clearing and construction can commence.
Extent of impact	Site and local	Can be severe if not well managed. Must be done on a daily basis (part of the EMP).
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality. Water pollution can be a severe problem.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be high.
Probability of occurrence	High	Must be managed on daily basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Marginal - compounding	If no maintenance is done, the impact will have a compounding impact on the environment.
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Proper ablution facilities on site. • Constant rehabilitation of erosion problems. • Berms to contain spills. • Proper storage facilities of construction materials. • Waste management is very important. Proper	This refers to storage of material, oil and fuel spills, ablution facilities and rehabilitation of construction sites at the completion of the project. Due to the nature of the slopes and soils, water pollution can be a problem if not properly managed.

	storage and removal strategy must be in place. • Must have rehabilitation strategy as part of EMP.	
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• Proper strategy to prevent erosion – see above. • Berms and containment measures for fuels and oils, also around transformers to prevent spills during accidents and maintenance. • Cleanup plan/strategy if spills occur. • Proper facilities (ablution) to ensure no sewerage spills into streams and rivers. • Proper storage of material during construction and cleanup after the construction is completed. • Proper strategy to remove and dispose of oil from transformers.	
Nature of issue	Poaching, removal of medicinal plants and wood collection	Includes all areas along the construction route. Wood collection is a problem in certain areas – see report. Free roaming game (especially small and medium sized game) is still abundant in certain areas.
Stage	Construction and maintenance	Must have a strict environmental guidelines and management plan in place before clearing and construction can commence. All contractors must be made aware of the potential problems related to these issues.
Extent of impact	Site and local	Can be severe if not well managed. Regular inspections are needed and all vehicles must be searched for wood and bush meat (part of the EMP).
Duration of impact	Immediate	If not addressed on constant basis, permanent localised problems can occur – removal of medicinal plants etc.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be moderate.
Probability of occurrence	High	Must be managed on daily basis.
Status of the impact	Project: negative	If well managed, can be neutral for both.

	Environment: negative	
Cumulative impact	Marginal - compounding	If no control is carried out, the impact will have a marginal impact on the environment.
Level of significance	Low if controlled.	Will be medium if not managed.
Mitigation measures	• Proper instructions to all contractors and staff. • Regular inspection of vehicles and staff. • Must have strategy in place as part of EMP.	This refers to education of staff prior to construction.
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• Proper strategy to educate contractors and staff. • Regular inspections – contractors, ESKOM and conservation authorities. • Proper strategy to ensure minimal impacts.	
Nature of issue	Alien vegetation	Includes all exposed areas – substation sites and servitudes for the power lines.
Stage	Construction and maintenance	Must have a strict environmental guidelines and management plan in place before clearing and construction can commence.
Extent of impact	Site and local	Can be severe if not well managed. Must be done on a daily basis (part of the EMP).
Duration of impact	Immediate	If not addressed on constant basis, permanent damage is a reality. Many exotics are present and can invade exposed areas during and after construction.
Intensity	Low/moderate	If not properly managed as part of operational plan, it will be very high.
Probability of occurrence	High	Must be managed on regular basis.
Status of the impact	Project: negative Environment: negative	If well managed, can be neutral for both.
Cumulative impact	Marginal - compounding	If no maintenance is done, the impact will have a compounding impact on the environment.
Level of significance	Low-medium if controlled.	Will be very high if not managed.
Mitigation measures	• Need to ensure all alien plants on construction sites are removed.	This refers to storage of material, oil and fuel spills, ablution facilities and rehabilitation of construction sites at the

	• Must clear alien vegetation on a regular basis. • Must plant/re-seed with indigenous grasses as part of EMP. • Disturbed areas around the construction sites should be re-vegetated using a specified seed mix and/or appropriate indigenous grasses, forbs, shrubs or trees. Lists of plant species must be approved by a qualified vegetation ecologist and/or appropriate government authorities. • Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grasses adapted to the local environmental conditions. The grass seeds should a variety of grass species including several pioneer species. • Must have rehabilitation strategy as part of EMP.	completion of the project. Due to the nature of the slopes and soils, water pollution can be a problem if not properly managed.
Level of significance after mitigation	Low.	Will have to form part of the EMP to ensure low impact/significance at completion.
EMP requirements	• Proper strategy to prevent invasive alien plants from establishing and this will further prevent pollution and erosion – see above. • Regular maintenance and inspections and removal of alien plants. • Possible to link with Working for Water in this regard.	