

7. EVALUATION OF POTENTIAL IMPACTS ASSOCIATED WITH THE PROPOSED HYDRA SUBSTATION EXTENSION

In order to accommodate the increase in Transmission load within the area Eskom propose, it is necessary to extend the existing Hydra Substation situated on Eskom owned property.

7.1 Potential Impacts on Topography

The study area is located within a generally flat area interrupted at intervals by a number of hills and ridges. The height of the study area ranges from 1300 m to 1800 m. Prominent ridges within the study area the include Bulberg, located north of the Gamma Substation site and the Horseshoe located in the south close the Gamma Substation site. Other ridges and hills in the study area include the Platberg, Nooinberg, Groot and the Tafelberg ridge.

Disruption or modification of physical landforms to some degree is the most readily noticeable impact associated with the construction of any infrastructure. The direct impact on landforms with the establishment of a substation is mainly one of disruption of surface soils and vegetation. The study area is impacted on by existing Transmission lines and the Victoria capacitor station, which is located approximately 3 km to the east of the Gamma substation site. Potential impacts on topography associated with the proposed project are anticipated to be localised and restricted to foundation areas. Substation sites are required to be on level terrain and, therefore, these sites typically have minimal impact on the local topography, apart from the substation foundations.

7.1.1 Conclusions

Potential impacts on topography are anticipated to be limited to the construction phase and construction areas and of low significance as no major changes to the landscape are required.

7.1.2 Recommendations

No additional studies are required to be undertaken within the EIA with regards to potential impacts on topography, as primary impacts associated with substation construction are associated with the disruption of the soil surface.

7.2 Potential Impacts on Substation Components Associated with Climate and Atmospheric Conditions

The local climate is anticipated to have very little impact on the substation components, but may cause small variations in the transmission of electricity.

Extreme phenomena are unlikely to pose a threat to the substation, although secondary effects such as flood conditions associated with high rainfall may present problems to the operation of the substation. Such events are, however, rare within the study area and, therefore, the risk associated with this potential impact is anticipated to be of very low significance.

With the adoption of mitigating measures to alleviate the threat posed by lightning to the transmission of electricity, no negative impacts are anticipated from this phenomenon.

Levels of pollution within the atmosphere may present operational problems to the substation. Oxidation and subsequent corrosion of metallic components may occur with time. This potential impact is considered to be highly unlikely due to the relatively rural nature of the area.

7.2.1 Conclusions

An assessment of the potential impacts of climate and atmospheric conditions (e.g. potential impacts associated with lightning, precipitation and pollution levels) on the proposed extension of the Hydra substation should be undertaken during the design phase. This is to provide an indication of what conditions are required to be accounted for by the design team to extend the life and reliability of the new infrastructure.

7.2.2 Recommendations

As the potential impacts associated with climate and atmospheric conditions are anticipated to be of low significance, no additional environmental studies are required to be undertaken in this regard.

7.3 Potential Impacts on Surface Water

The study area is located in an arid area within the Karoo. The closest major river to the Hydra Substation site is the Elandsfonteinrivier, a perennial river that runs to the south of the proposed substation extension site.

The construction of structures close to rivers impacts on water resources through sedimentation and pollution. These potential impacts can be minimised through the implementation of appropriate mitigation measures. Potential impacts on the surface water are, therefore, expected to be of low significance and limited to the construction phase, as the substation site is relatively flat, reducing the potential rate of soil erosion.

7.3.1 Conclusions

The broader substation site is located in a flat area with low soil erosion potential. The potential impacts of the proposed extension of the Hydra Substation on the surface water, is expected to be of low significance.

Table 7.1: Potential impacts on surface water associated with the extension of the Hydra Substation

	Extent	Duration	Probability	Significance	Status
Construction of substation	Local	Short-term	Likely	Low	Negative

7.3.2 Recommendations

In order to minimise the potential impacts on surface water, the following mitigation measures are recommended:

- Vegetation stripping should occur in parallel with the progress of construction in order to minimise erosion and/or runoff.
- Exposed areas should be re-vegetated as soon as possible on completion of construction within each area.
- To prevent sedimentation into the river channel during construction, sediment should be piled alongside the site and re-used for rehabilitation purposes, so as to prevent it entering the aquatic system during rain events. Should sediment have to be stored on site for a period of time, it should be away from the river channel and bunded to prevent run-off.
- An Environmental Management Plan (EMP) should be compiled outlining site-specific measures which should be implemented to minimise impacts on topography and erosion.

7.4 Potential Impacts Associated with Geology and Soils

The construction of the Hydra Substation extension requires foundations to be constructed in order to increase the stability of the structure. The depth of the foundations will be determined by the underlying geology of an area. Soil conditions within the substation area are considered to be of satisfactory condition for the construction of foundations for the proposed substation without the need for any further stability needs.

The greatest impact on the geology and soils associated with the construction of any structures is soil erosion. This impact depends on the soil erosion potential of the overlying soils. The potential soil erosion rate of the area is high due to the

nature of the soils and the limited vegetation covering the soil surfaces. Erosion potential is anticipated to increase during the site clearance and construction activities of the proposed substation if appropriate mitigation is not implemented. In addition, the construction and maintenance of the access/service road to the substation site could potentially pose a very high erosion risk in the future, particularly in those areas with soils prone to erosion. The impacts associated with an increase in erosion risk include: accelerated soil erosion, an increase in silt loads and sedimentation, soil disturbance, increased run-off from compacted areas, etc.

7.4.1 Conclusions

The potential soil erosion risk is a localised impact, which is site specific to the substation site and/or access/service road. As the substation site is relatively flat, the potential risk of soil erosion is, however, reduced at this site. Without the implementation of appropriate mitigation measures during construction and maintenance activities, this impact is anticipated to be of moderate significance at the substation site. Where a new access/service road is required to be constructed, an impact of moderate significance is anticipated unless appropriate mitigation measures are implemented.

Table 7.2: Potential impacts associated with geology and soils associated with the extension of the Hydra Substation

	Extent	Duration	Probability	Significance	Status
Construction of substation	Local	Long-term	Likely	Moderate	Negative
Establishment of access/service roads	Local	Long-term	Likely	Moderate	Negative

7.4.2 Recommendations

In order to minimise the potential for erosion, the following mitigation measures are recommended:

- As far as possible, use should be made of the existing access road to the substation site.
- All areas that are disturbed during construction should be suitably rehabilitated, and, if necessary, re-vegetated with a suitable grass mix that complements the surrounding natural vegetation.
- Spoil from cut areas should be used for the in-filling of erosion gulleys or be used in the rehabilitation of excavated sites, which will ultimately result in an aesthetically pleasing landform which blends in with the existing environment.

- As much of the removed rock from cut areas as possible should be utilised in the construction of access roads, so as to minimise the amount of spoil material, as well as the need for excessive excavation at borrow pit areas. Should the need for borrow pits be evident, permits will be required to be obtained by Eskom for such borrow pits.
- Rehabilitated areas that are susceptible to erosion due to their position in the landscape should be adequately protected by soil conservation measures.
- Re-vegetated areas should be monitored every 3 months for the first 12 months and once a year thereafter until the vegetation is stabilised.
- Rehabilitated areas showing inadequate surface coverage (less than 30% within 9 months after rehabilitation) should be prepared and re-vegetated from scratch with a suitable grass mix that blends with the surrounding vegetation.
- Damage to rehabilitated areas should be repaired promptly.
- The erosion risk will be reduced significantly during the dry season, i.e. winter. Therefore, depending on the construction schedule, excavation activities should aim to be focussed during winter, where possible or practical.
- Exotic weeds and invaders that may establish on the rehabilitated areas should be controlled to allow pioneer grasses to adequately establish.
- An Environmental Management Plan (EMP) should be compiled outlining site-specific measures which should be implemented to minimise impacts on topography and erosion.

7.5 Potential Impacts on Agricultural Potential

Due to the low potential of the soils, as well as the low annual rainfall (<250 mm) and high summer temperatures (>35°C), the study area is not suitable for dryland cultivation and has, at best, limited grazing potential.

In general, the agricultural potential of the soils in the study area is not high, due to restricted soil depth, subsoil structure and clay content, as well as the prevailing climatic conditions in the area. Therefore, the impact on agricultural potential as a result of the extension of the substation is considered to be localised and of low significance.

7.5.1 Conclusions

The agricultural potential of the soils in the study area is not high, therefore the impact on agricultural potential is considered to be localised and of low significance.

Table 7.3: Potential impacts on agricultural potential associated with the extension of the Hydra Substation

	Extent	Duration	Probability	Significance	Status
Construction of substation	Local	Short-term	Likely	Low	Negative

7.5.2 Recommendations

As the potential impacts on soils and agricultural potential is anticipated to be of low significance, no additional environmental studies are required to be undertaken in this regard.

7.6 Potential Impacts on Vegetation and General Ecology

The construction of the Hydra Substation extension will not impact on highly sensitive areas in terms of natural vegetation. The diversity in habitat associated with the vegetation type which occurs within the study area is low. Potential impacts which are anticipated include:

- the total destruction of the vegetation at the substation site,
- the loss of rare, endangered and/or protected species (although none were recorded on site, the potential occurrence of these species cannot be ruled out),
- disturbance of natural vegetation along the access route through trampling, compaction by motor vehicles etc., and
- establishment and spread of declared weeds and alien invader plants from disturbed areas, which can lead to the eventual replacement of indigenous vegetation.

Although the majority of these impacts could occur, they will be localised and of moderate significance due to the low sensitivity of the vegetation in the area of the proposed site. Through the implementation of appropriate mitigation measures, these impacts are anticipated to be of low significance.

7.6.1 Conclusions

The extension of the Hydra Substation will not impact on highly sensitive areas in terms of natural vegetation since vegetation along the power line servitude is considered to be degraded due to the presence of the existing Transmission power lines and related infrastructure.

Table 7.4: Potential impacts on vegetation and general ecology associated with the extension of the Hydra Substation

	Extent	Duration	Probability	Significance	Status
Total destruction of vegetation at substation site	Local	Permanent	Definite	Moderate	Negative
Loss of rare, endangered and/or protected species	Local	Permanent	Unlikely	Moderate	Negative
Disturbance of natural vegetation along the access routes through trampling, compaction by motor vehicles etc	Local	Short-term	Definite	Moderate	Negative
Establishment and spread of declared weeds and alien invader plants from disturbed areas	Local	Long-term	Likely	Moderate	Negative

7.6.2 Recommendations

In order to minimise the potential impacts on vegetation and general ecology, the following mitigation measures are recommended:

- *Total destruction of the vegetation at the substation site:*
The permanent loss of vegetation within the substation area cannot be prevented. It can, however, be minimised:
 - * Construction activities should be restricted to the minimum area needed.
 - * Measures should be implemented to prevent spillage of concrete or other construction related materials and substances that could permanently destroy vegetation.
 - * Removal of all excavated material (rocks, excess soil etc.) and construction rubble after construction is completed.

- *Loss of rare, endangered and/or protected species:*
The final substation site should be surveyed and verified by a vegetation specialist to determine:
 - * The actual occurrence of threatened and or protected plant species; and to ensure that appropriate mitigation measures are taken i.e. removal of

- plants for genetic propagation, relocation of plants (relocation of sensitive species are seen as the last option because of the often unknown secondary impacts of the relocated plants on the receiving environment and the low probability of long term survival of the relocated specimens due to often high habitat specificity)
- * Where indicated, sensitive vegetation, habitat or species populations should be adequately protected (e.g. fenced) during construction. Access to these areas should be strictly prohibited.
- *Disturbance of natural vegetation along the access route through trampling, compaction by motor vehicles etc.:*
 - * After completion of construction, all access roads that will not be used for future maintenance of the substation should be rehabilitated and re-vegetated if necessary to blend in with the surrounding vegetation.
 - * Areas on construction sites that were visibly compacted by construction activities should be ripped to allow easier re-establishment of natural vegetation.
 - *Establishment and spread of declared weeds and alien invader plants from disturbed areas:*
 - * Monitoring the potential spread of declared weeds and invasive alien vegetation to neighbouring land and protecting agricultural resources and soil conservation works are regulated by the Conservation of Agricultural Resources Act (No 43 of 1983) and should be addressed on a continual basis.
 - * In view of the fact that the presence of declared weeds is illegal, it is recommended that the land owner/manager comply with the following legally prescribed requirements:
 - a) The land owner/manager must take steps to eradicate the declared weeds by using the methods prescribed in the regulations, namely
 - uprooting and burning, or
 - the application of a suitable chemical weed-killer (herbicide), or
 - any other method which will ensure their permanent eradication.
 - b) One may not uproot or remove such plants and dump or discard them elsewhere to re-grow or to allow their seeds to be spread or blown onto other properties.
 - c) If the landowner/manager does not comply with the requirements under a) and b) above, he/she is guilty of a criminal offence.

7.7 Potential Impacts on Avifauna

Potential impacts on bird species present in the area associated with the construction of a substation include the removal and destruction of vegetation, and disturbance during the construction and maintenance of substations. The

destruction of vegetation inevitably results in the loss of suitable habitats for several bird species. The construction of infrastructure for a typical substation composition results in the permanent loss of vegetation and, therefore, can result in a permanent loss of some habitats.

7.7.1 Habitat Destruction

During the construction and maintenance phases of substations, some habitat destruction and alteration inevitably takes place. This happens with the construction of access roads and the clearing of the substation site. Regular maintenance of the substation site is required in order to prevent interference of vegetation with the operations of the substation. These activities could have an impact on birds breeding, foraging and roosting in, or in close proximity of the servitude, through destruction of habitat. The proposed substation site is located in an area which is currently lying fallow. The potential of bird species habitat occurrence within this area exists.

7.7.2 Disturbance

The construction of a substation can result in disturbance to birds breeding in the vicinity of the construction activities. Should this disturbance take place during a critical time in the breeding cycle (e.g. prior to eggs hatching, or just prior to the chick fledging), it could lead to temporary or permanent abandonment of the nest or premature fledging, resulting in fatality for the eggs or the fledgling. Such a sequence of events can impact on certain large, rare species that only breed once a year or once every two years.

Potential impacts on birds species resulting from the extension of the substation are anticipated to be localised and restricted to the substation site and access route/s and of moderate to high significance as the area is currently fallow and several bird species may have established themselves within the broader substation site.

7.7.3 Conclusions

A number of Red Data species, which are sensitive to interactions with substation infrastructure, could potentially occur within the broader study area. The extension of the Hydra Substation will result in the loss of habitats and disturbance of bird species within the broader study area. However, this activity is not anticipated to have a significant impact on Red Data avifauna through habitat destruction, or disturbance.

Table 7.5: Potential impacts on avifauna associated with the establishment of the Hydra Gamma 2 Transmission line

	Extent	Duration	Probability	Significance	Status
Habitat destruction	Local	Permanent	Definite	Moderate to high	Negative
Disturbance	Local	Short-term	Likely	Moderate to high	Negative

7.7.4 Recommendations

In order to minimise the potential impacts on avifauna, all construction, maintenance and decommissioning activities in any natural habitat should be carried out in accordance with best environmental practice principles so as to minimise disturbance of any natural habitat. Site specific details should be provided within an EMP.

7.8 Potential Impacts on Visual/Aesthetic Aspects

Any change in a local view through the introduction of a new development in the line-of-sight can be considered as a visual impact. Visual impacts are subjective, and are usually considered most significant when the development is not of a similar nature to other developments in the area, or is readily viewed from areas of public access, paths, roads and view points, or in areas which are characterised by significant natural features.

The visual impact assessment for the proposed substation was informed by the generation of maps indicating the visibility of the substation to surrounding areas. The visibility is ranked on a scale of high to low based on the proportion of the substation that is visible. The visibility of the structure is a function of the lie of the land.

The structure and design of substations or switching stations are related to their function, and do not allow for many variations that may allow for a reduction in visual intrusions. Substations constitute a grouping of narrow, linear structures. This feature results in a rapid reduction in the visibility of these structures with increasing distance

The proposed substation can be considered to impose a high visual impact as a result of its larger size and low aesthetic appeal. In addition, the visibility of these structures is significantly higher if viewed against the skyline as is typical in open Karoo landscapes. Therefore, the construction of the new substation is anticipated to add significantly to this visual impact, as this infrastructure is steel-

intensive and considered to be visually intrusive. The potential visual impacts are assessed according to the visual assessment criteria as tabulated in Table 7.6.

7.8.1 Visual Intrusiveness

The proposed substation can potentially be viewed from a distance of 5 km. The substation will be visible from all directions as a result of the flat nature of the topography in the area. The visual intrusiveness is considered to be high for a fixed point development. As a result, the potential impact is anticipated to be of high significance.

7.8.2 Degree of Obstruction

The surrounding flat terrain does not easily obscure the view of the substation. The proposed site is currently fallow cultivated lands, which does not act as a screen against the visibility of the substation. However, the presence of the existing Hydra Substation adjacent to the proposed extension site mitigates this impact to some extent. Therefore, an impact of moderate significance is anticipated.

7.8.3 Character, Quality or Value of the Viewpoint and Compatibility with Surrounding Land Uses

The area surrounding the substation can be regarded as having a medium to low level of aesthetic value, as it consists predominantly of cultivated and grazing lands. In addition, the area within which the proposed Hydra Substation extension is proposed is already impacted by existing Transmission line infrastructure (No 1, 2 and 3 Hydra-Droërvier 400 kV lines) as well as the existing Hydra Substation, which is located adjacent to the substation extension site. Therefore, the visual quality of the area is already impacted by developments of a similar nature. Therefore, an impact of moderate to low significance is anticipated in terms of this aspect.

7.8.4 Scale of Development

The substation site will be 200 m x 250 m in extent, with 40% of the area occupied by the high voltage yard. The substation will be larger than the surrounding developments, and the steel intensive nature also contributes to a difference in scale and conspicuousness of the substation. However, as the substation is not a solid structure, it will be less visible than a building of the same height, particularly with increasing distance. Therefore, an impact of moderate significance is anticipated.

7.8.5 Critical Views

The N10 from De Aar towards Middelburg passes to the south-east of the broader substation site. The existing Hydra Substation and proposed substation will be visible from this road. However, the visual impact associated with this proposed development is not anticipated to add significantly to the existing impact imposed on the views from this route by the existing Transmission line infrastructure and the Hydra Substation. Therefore, the potential impact on views from this road is anticipated to be of low significance.

7.8.6 Conclusions

The potential visual impact associated with the construction of the substation is anticipated to be of low to moderate significance since the study area is already impacted by existing substation and power line infrastructure.

Table 7.6: Potential impacts on visual/aesthetic aspects associated with the extension of the Hydra Substation

	Extent	Duration	Probability	Significance	Status
Visual intrusiveness	Local	Long-term	Definite	Moderate	Negative
Degree of obstruction	Local	Long-term	Definite	Moderate	Negative
Character, quality or value of the viewpoint and compatibility with surrounding land uses	Local	Long-term	Definite	Moderate to low	Negative
Scale of Development	Local	Long-term	Definite	Moderate	Negative
Critical views	Local	Long-term	Definite	Low	Negative

7.8.7 Recommendations

As the potential visual impact associated with the construction of the substation is anticipated to be of low to moderate significance and since the study area is already impacted by existing substation and power line infrastructure, no additional environmental studies are required to be undertaken in this regard.

7.9 Impacts on the Social Environment

7.9.1 Employment Opportunities

Due to the specialised work to be undertaken during the construction phase of a substation, it is not expected that the proposed project would have any impact on employment opportunities in the area, as locals would not be able to undertake the work. Limited opportunities for manual labour exist where the local contractor could make use of locals to assist with some activities associated with the construction of the proposed substation (e.g. fencing, access roads).

It is anticipated that the management of the proposed substation would be co-ordinated from the Hydra Substation itself (near de Aar), again not resulting in employment opportunities.

According to the Ubuntu Municipality these limited opportunities are still seen as a positive injection for the area. The significance of the impact is thus rated as moderate, although the intensity is rated as low due to the limited job opportunities created for locals.

7.9.2 Influx of Job Seekers and Impact on Local Population Figures

Although the site earmarked for the proposed Hydra Substation extension is outside De Aar (5 km), there could be some form of influx of job seekers once construction of the substation has started. This could have a medium-term negative impact on the surrounding landowners as it is expected that the construction period would continue for approximately two years.

The main impact associated with the influx of the temporary construction workers is the activities at the construction camp(s) where these workers would be housed.¹ It is expected that the outsider construction work force would engage in social and sexual relationships with the local communities resulting in the disruption of the social networks in the area. This is especially evident in small-scale communities with well-established social networks and institutions. Uncontrollable behaviour (e.g. illegal trade in liquor, livestock and other banned substances, unauthorised entry of private properties, sex worker trade, drunkenness, etc.) and the possible dissimilarity in age, gender and race of the outside workforce compared to the resident population could also exacerbate this negative impact.

¹ It is anticipated that, for the whole duration of the construction period, one construction camp would be situated on the farm Hydra 144 (Eskom's property) where the substation would be built. Additional construction camps could be set up along the way as the construction of the transmission line progresses.

Due to the highly skilled work required for the operation of the substation and the limited number of individuals that would work at the substation, it is not expected that there would be a significant influx of workers and/or job seekers to the area and the impact thereof is thus seen as insignificant.

7.9.3 Population Change

An additional workforce of 300 individuals in total would have a temporary impact on the local population figures due to the low population density in the study area. This could result in short-term positive impacts on the local economy as a result of the people staying and spending their money in this area, although it might put additional pressure on the community infrastructure and service requirements (e.g. health care facilities, policing services). This impact is rated as moderate, although all 300 individuals would not all be present in the area at any one time.

The operational phase of the project is not anticipated to result in any population changes and the impact is thus seen as insignificant.

7.9.4 Residential Proximity

Construction related intrusion impacts (concerns regarding the impact on the local environment, public safety, noise and dust effects etc.) on residences are considered to be only temporary and of a moderate significance.

The impact on residences (e.g. visual, possible perceived health impacts etc.) would be permanent once the substation has been erected and concerns have thus been raised with regards to the substation and the alignment of the transmission line near residences, worker accommodation, as well as near accommodation facilities catering for tourists and seasonal hunters.

The site earmarked for the construction of the proposed Hydra Substation extension (i.e. on the farm Hydra 144) is located on Eskom-owned property, and although there is a lease agreement in place, the house situated in close proximity to the proposed site is not occupied by the lessee. It is not anticipated that the positioning of the proposed extended Hydra Substation would have any negative impact on the residences of the adjacent farms.

7.9.5 Disruption in Daily Living and Movement Patterns and Impact on Land-use

The construction vehicle activity associated with the construction of the Hydra Substation extension could have an impact on the local roads (more rapid

deterioration due to heavy vehicles and increase in traffic). In addition, construction workers might not adhere to the speed limits and there is also the risk of after hours drunken driving on the local roads. Should there be an influx of job seekers to the area, the erection of informal dwellings in the vicinity of the construction camp and/or construction site, as well as the related health impacts could have a negative impact on the daily living and movement patterns of the residents in the area.

The extended Hydra Substation will be managed from De Aar, no land acquisitions need to be carried out for this site and there would be very limited operational traffic. No major impact on the daily living and movement patterns of the adjacent landowners and the lessee is thus expected during the operational phase.

7.9.6 Impacts on Land and Resource Use

Previously, sheep farming mainly characterised the study area, but there is currently a shift to a combination between sheep, cattle and game farming, as well as eco-tourism activities such as the development of hiking trails. It is not anticipated that the Hydra Substation extension would, during its construction and operations, have severe negative impacts on the land and resource use of the adjacent landowners, as the site earmarked for the development of the substation is on Eskom-owned property.

7.9.7 Formation of Attitudes

At this stage there is no evidence of focused attitude formation by landowners and/or other stakeholders for or against the proposed project.

7.9.8 Impact on Infrastructure and Services

Infrastructure and services that could be disturbed by power lines and substations include airfields, rivers, roads, railway lines, centre pivot systems and interference with radio and television broadcasts.

The influx of construction workers and job seekers to the area could result in an increased demand for water provision, waste removal and sanitation services, but the contractor is typically responsible for the provision of those services as stipulated in the Environmental Management Plan. If not properly managed, this could have secondary negative impacts on the environment. The impact is thus rated as moderate.

Once operational, the extended Hydra Substation is not expected to impact on existing infrastructure and services. The existing tar road off the N10 will be used

to access the site and all regulations and legislation pertaining to such use, including road restrictions, should be noted and adhered to.

7.9.9 Impact on Local Economy and Regional Benefits

Some temporary local economic benefits may be realised through the purchasing of local goods and using services at De Aar during the construction of the Hydra Substation extension (e.g. increased retail services, increase in demand for temporary accommodation, increase in demand for mobile housing facilities etc.). Equipment for the substation would, however, not be sourced locally. As there would be a very limited number of locals that could secure part-time employment during the construction phase, and full time employment during the operational phase of the project, it is not anticipated that any long-term economic spin-offs would be created due to increased income levels.

It is thus not anticipated that the proposed extended Hydra Substation would have a significant long term bearing on the Ubuntu and Emthanjeni Municipalities, the local communities and/or on the local economy, although it could assist in improving the electricity service delivery to other parts of the country.

7.9.9.1 Health Impacts

An increased health risk, such as the spread of HIV/Aids with long-term regional consequences, could be created due to the influx of workers (increase in population) to the area and the social interaction between these outsiders and the local population. Although Eskom or the contractor cannot be held responsible for the social conduct of the workers, they should take note of this impact and assist wherever possible to limit the spread of the disease². If construction camp activities and operations (sanitation practices, wastewater management, water provision, solid waste management, facilities, cooking facilities etc.) are not adequately managed, severe negative impacts on the environment with related health problems can be anticipated.

Occupational health risks are also associated with any construction activity such as the construction of a substation. These should be addressed in terms of the requirements of the Occupational Health and Safety Act.

² According to a representative of the Ubuntu Municipality, the HIV/Aids prevalence amongst the local communities in the area is approximately 20%, which is rated as high.

7.9.11 Conclusions

Based on the findings from the Social Scoping Study, it is not anticipated that the proposed extension of the Hydra Substation would have severe long-term negative social impacts. Impacts associated with the construction period could have limited short-term negative impacts on the surrounding properties. Construction related activities that could result in negative impacts relate to the construction of the substation, as well as possible dust and noise pollution.

Table 7.7: Potential impacts on the social environment associated with the extension of the Hydra Substation

	Extent	Duration	Probability	Significance	Status
Employment opportunities	Local	Short-term	Likely	Moderate	Positive
Influx of job seekers and impact on local population figures	Local	Long-term	Unlikely	Moderate to Low	Negative
Population change	Local	Long-term	Likely	Moderate to none	Negative
Residential proximity	Local	Long-term	Unlikely	Low	Negative
Disruption in daily living and movement patterns & impact on land-use	Local	Long-term	Likely	Moderate to low	Negative
Impacts on land and resource use	Local	Long-term	Unlikely	Low	Negative
Impact on infrastructure and services	Local	Long-term	Unlikely	Moderate to none	Negative
Impact on local economy and regional benefits	Local & regional	Long-term	Likely	Moderate	Positive
Health impacts	Local & regional	Long-term	Likely	High	Negative

7.9.12 Recommendations

- *Employment Opportunities*
 - * Care should be taken to avoid any potential conflict between the locals seeking employment and the outside workforce. There might be the need for some conflict resolution in this regard.

- * It was suggested by representatives of the Ubuntu Municipality that the Municipal Manager should be informed of the conditions of the contract to enable him to intervene (if necessary) in the case of conflict between the contractors and the local communities.
 - * Where employment opportunities exist that would require low or medium skills levels, local labour should be used.
 - * Eskom could undertake some skills training to maximise the opportunity for locals to secure employment. In this regard, a labour desk could be created, in consultation with the relevant local authorities, to determine the available skills in the area and the level of training required.
 - * Where possible, on-the-job training should be provided to locals, to develop their existing skills and to ensure that they receive skills that are transferable to other sectors.
- *Influx of Job Seekers and Impact on Local Population Figures*
 - * Before construction commences, representatives from the various local authorities, community-based organisations and agricultural unions, as well as the property owners should be consulted. Construction activities and schedules, as well as the location of the construction camps should be discussed and finalised with these representatives and the local property owners.
 - * Illegal and disruptive practices associated with the construction camps such as the selling of liquor, illegal trade in game and livestock, cutting of fences, unauthorised entry on properties, poaching of game and sex worker trade should be avoided. A reporting system should be put in place. The Community Development Office (where locals could lodge general complaints) of the Ubuntu Municipality could serve as a platform where complaints could be lodged.
 - * Property owners should be informed of the correct procedure for lodging complaints with regard to the behaviour of contractors and/or Eskom maintenance workers.
 - * Should there be any dissimilarity between the local population and the outside workforce there might be the need for some conflict resolution. Pro-active conflict resolution practices should be established.
 - * The local police services should be kept informed of the planned developments to ensure that they would be able to adequately deal with any type of disruptive behaviour.
 - * During the operational phase of the project, it would be ideal if the Eskom workers could inform the property owners when they would access the property.
 - * Eskom should continue with the "Gate logbook" system that is currently in place. By using this system Eskom maintenance workers can demonstrate when (date and time) they drove drive through a gate (by

referring to the position by means of the tower numbers) and whether the gate was locked, opened or closed.

- *Population Change*
 - * Liaison with representatives of the Ubuntu and Emthanjeni Municipalities should continue to enable them to plan for and monitor the impacts associated with the potential population change.

- *Disruption in Daily Living and Movement Patterns and Impact on Land-use*
 - * Affected landowners and residents should be notified regarding the construction and maintenance schedules associated with the Hydra Substation extension.
 - * Construction activities, should as far as possible, be scheduled not to coincide with the main hunting and/or lambing season.
 - * The construction camps should be organised in such a manner as to have the least negative impact on the surrounding landowners and local communities. Strict guidelines should be developed to ensure good conduct and these guidelines should be stipulated in the Environmental Management Plan and construction contract.
 - * An on-site Environmental Officer should monitor the contractors responsible for the construction activities.
 - * The erection of uncontrolled informal dwellings at the construction camps should be avoided.
 - * Although the contractor cannot be held responsible for the conduct of the construction workers (especially after hour conduct), the guidelines as stipulated in the Environmental Management Plan regarding the operation and management of the construction camps should be strictly adhered to.

- *Impacts on Land and Resource Use*
 - * Affected landowners and residents should be notified regarding the construction and maintenance schedules associated with the Hydra Substation extension.
 - * Construction activities, should as far as possible, be scheduled not to coincide with the main hunting and/or lambing season.
 - * As the impacts on the veld and erosion were noted as concerns, contractors should be forced to only utilise existing roads and paths and avoid the creation of additional roads. Fines and penalties should be imposed where this condition is not adhered to.
 - * Eskom should liaise with the lessee on the farm Uitvlugfontein and pro-actively address the possible impact on the land and resource use of the lessee.

- *Impact on Infrastructure and Services*
 - * The construction camp management should adhere to the guidelines as stipulated in the Environmental Management Plan.

- *Impact on Local Economy and Regional Benefits*
 - * Eskom could assist with local skills training to maximise the potential of the local community to establish indirect jobs through the supplying of goods and services to the construction work force.
 - * The final route alignment should be negotiated to have the least negative economic impact on the property owners.
 - * During the construction phase care should be taken to avoid any negative impacts on farming activities in the area.
 - * Eskom should ensure appropriate valuation of the land, taking the impact of the substation on the property into account, and determine adequate compensation accordingly.
 - * Eskom should avoid lengthy negotiation procedures where possible.

- *Health Impacts*
 - * Eskom should commit itself to building a substation that would not be harmful to the health of any residents.
 - * Any possible exposure effects and related health concerns should be mitigated through the application of relevant design standards.
 - * Contractors should not leave any waste behind upon closure of the construction camp.
 - * Eskom and/or the contractor should provide basic on-site health care facilities for the construction workers.
 - * Adequate and appropriate sanitation and wastewater management facilities should be implemented as specified in the Environmental Management Plan.
 - * Eskom should liaise with the local authorities and health care practitioners with regard to service requirements and the establishment of an emergency plan in the case of accidents.
 - * Aids Awareness Campaigns should be intensified during the construction phase of the project. These could possibly link with the existing work undertaken by the Apollo Love Life centre.

7.10 Impacts on Tourism Potential

The potential tourism impact of the substation is negligible, as Eskom owns the land where the existing substation is located and no tourism establishments exist on the property.

7.10.1 Conclusion

The impact of extending the Hydra Substation and constructing the additional 765 kV between the Hydra and Gamma Substations on the tourism potential is not considered to be significant, as the farms in the study area already have lines running across them and there are existing routes for maintenance teams to gain access to the substations.

7.10.2 Recommendations

As the potential impacts on tourism potential are anticipated to be of very low significance, no additional environmental studies are required to be undertaken in this regard.

7.11 Potential Impacts on Sites of Archaeological, Cultural and Historical Interest

The 1994 survey along the route of the Droerivier-Hydra 400 kV transmission line (Morris, 1994) revealed a total of 98 specific sites along the route between Hydra substation and the vicinity of the capacitor bank near the proposed Gamma substation, 21 of them of "higher" and "highest" significance. Few of these were expected to be directly impacted by the line (most lay away from tower positions, and roads were expected to be low-impact 'twee-spoor' tracks). An Earlier Stone Age site (Verborgen Fountain Site 3) at one of the tower positions was salvaged as a mitigation measure. Earlier, Sampson (1985:21) had made the relevant observation that power lines in the Zeekoei Valley had had "no marked impact on surface sites".

TABLE 1. Locales of "higher" (ranked 6-8 out of 10) and "highest" (ranked 9-10 out of 10) significance along the 765 kV corridor between the Hydra and Gamma Substations (Based on Morris, 1994).

Abbreviations: ESA = Earlier Stone Age; MSA = Middle Stone Age; LSA = Later Stone Age; OES = Ostrich eggshell.

Site/Farm	Lat-Long	Description	Significance
Hartebeest Hoek 1	30.45.26 24.04.35	Mixed ESA, MSA, LSA high density	9
Ezels Fountain 2	30.58.12 23.57.11	LSA Oakhurst below hill	9
Ezels Fountain 3	30.56.19 23.58.54	LSA surface scatter, East of line.	7
Jaag Poort 1	31.00.06 23.55.33	LSA scatter	6
Orange Valley 1	31.05.47	LSA late Wilton Complex with	10

	23.51.48	end scrapers, east of line	
Droogfontein 1	31.06.07 23.51.33	LSA late Wilton Complex with lithics, OES	10
Verborgen Fountain 1	31.10.09 23.49.10	LSA in middle of flat pan, localized scatter	9
Verborgen Fountain 2	31.12.33 23.47.26	ESA with bifaces, flakes, blades, cores	10
Verborgen Fountain 3	31.13.21 23.46.48	ESA high density on slope and top of terrace. <i>NOTE: This site was salvaged in 1995</i>	10
Patryfontein 1	31.19.30 23.42.36	MSA, LSA and small colonial era stone structures	8
Patryfontein 2	31.20.17 23.41.58	Twin-lobed circular stone structure (not corbelled), west of line	8
Excelsior 1	31.24.12 23.39.17	MSA, heavily weathered	9
Excelsior 2	31.25.30 23.38.00	LSA Oakshurst, MSA	7
Rondavel 1	31.26.46 23.36.41	MSA & LSA – highly weathered	7
Rondavel 2	31.26.48 23.36.40	LSA Wilton Complex in cleared areas on ridge	7
Rondavel 3	31.27.47 23.35.71	LSA Wilton Complex south of ridge	7
Bult en Reitfontein 1	31.31.57 23.31.39	LSA Oakhurst at watercourse	9
Nieuwefontein 1	31.32.49 23.30.50	LSA late Wilton Complex with small stone circle, OES eroding out.	8
Wynandsfontein 1	31.34.16 23.29.36	Colonial era structure at bottom of Blouberg.	9
Kleinfontein 1	31.39.53 23.25.59	MSA, south side of watercourse	8
Kleinfontein 2	31.39.55 23.25.58	MSA, LSA mixed on slight slope with vestigial hairline engravings on badly weathered rock surfaces	7

The vicinity of the Hydra substation was inspected in 1994 and no significant sites were noted then. It is not anticipated that the presently proposed extension would have a major negative impact on the heritage resources of the region.

7.11.1 Conclusions

Although potential impacts on heritage sites are associated with the study area, it is anticipated that the impacts associated with the extension of the Hydra Substation is anticipated to be of low significance.

Table 7.8: Potential impacts on heritage sites associated with the extension of the Hydra Substation

	Extent	Duration	Probability	Significance	Status
Impact on heritage sites	Local	Permanent	Unlikely	Low	Negative

7.11.2 Recommendations

If an artefact is uncovered on site, work in the immediate vicinity shall be stopped. Reasonable precautions must be taken to prevent any person from removing or damaging any artefacts. In addition, the local Provincial office of the South African Heritage Resources Agency (SAHRA) or the National Monuments Council must be informed such that a heritage consultant can be appointed to record the site and excavate if necessary. Work may only resume once clearance is given in writing by the heritage consultant.

If a grave is uncovered on site or discovered before commencement of work, all work in the immediate vicinity of the grave shall be stopped. Arrangements must be made for an undertaker to carry out an exhumation and reburial. The undertaker will, together with the National Monuments Council, be responsible for attempts to contact the family of the deceased and for the site where the exhumed remains can be re-interred. It should be noted that any graves older than 60 years can only be exhumed by an archaeologist. Graves of victims of conflict require additional permits from SAHRA before they can be relocated.