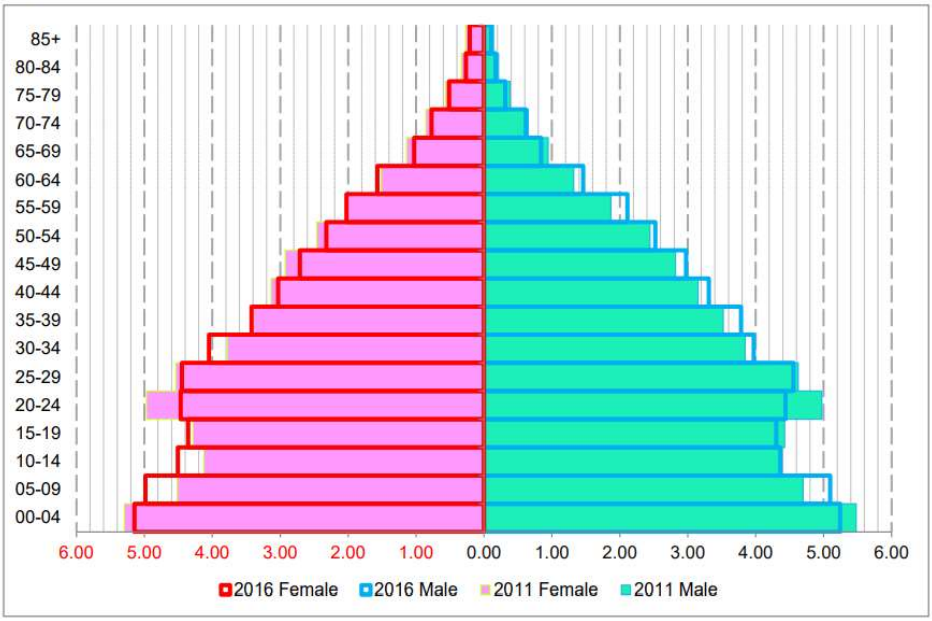
The population pyramid (figure 7) provides an indication that there were more people in younger ages, predominantly in age groups 0–4 and 5–9, and less people in older ages, predominantly from the ages 65 and older (DR Kenneth Kaunda IDP 2019/20). The graph explicitly indicates that between about ten (10) to twenty (20) years ago, infant mortality was high, thus the indentation in the pyramid. This is as a result of the high death rate experienced in the early 2000 due to the prevalence of HIV/AIDS. The death rate affected mainly young children and teens. The ages of 20 and upwards followed a normal pyramid pattern and is still following the same trend (DR Kenneth Kaunda IDP 2019/20).



Source: *Statistics SA, Census 2011*
Statistics SA, Community Survey 2016

Figure 7:Population pyramid in percentage indicating the age and gender composition percentage between 2011 and 2016.

7.3.4. Educational and employment demographics

The level of education in the JB Marks Local municipality for the periods 2011 and 2016 indicate that there was a decrease of less than 1% in the number of people without any schooling and a positive increase in those with matric from 27% to 30%. There was a 1% decrease in the number of people with higher education during the same period (figure 8) (DR Kenneth Kaunda IDP 2019/20).

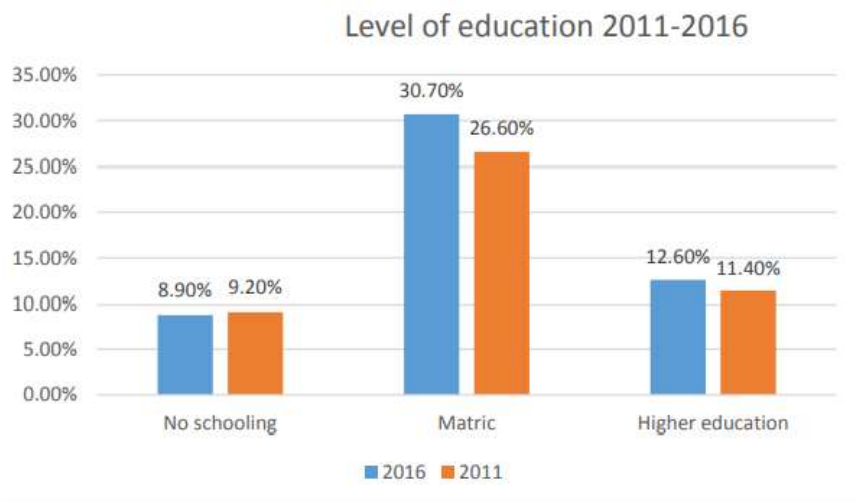


Figure 8:Level of education of JB Marks Local Municipality of 2011-2016

According to the Census 2001 figures (StatsSA, 2001), only 19% of the adult population (20-year-old+) had finished Grade 12, while only 6% had a tertiary/higher education qualification. Most of the adult population had some secondary level education but had not completed their matric certificates. 7% had completed primary level education up to Grade 7, while 19% had only some primary level education. 16% of the adult population, as measured in the census of 2001, had no schooling whatsoever. In the 2007 Community Survey (StatsSA, 2007), about 13% of the surveyed adult population had Grade 12 as their highest level of education, while 5% had some form of tertiary/higher education qualification. 12% of the surveyed adult population had no schooling (figure 9).

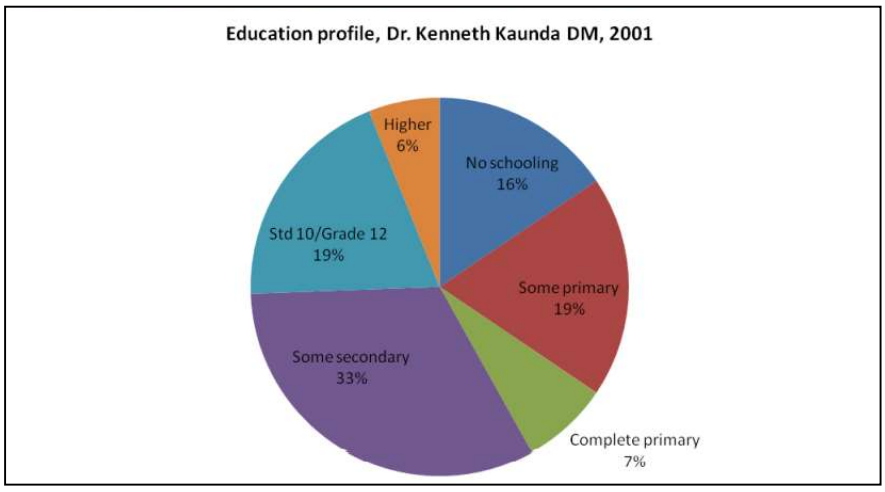


Figure 9:Educational profile of the 2001 census of Dr Kenneth Kaunda District Municipality

7.3.5. Economic characteristics

The JB Marks Region is divided into various of smaller areas called, mesozones. The economic activity within each of these mesozones is identified and provided according to the

JB Marks LM (2018-2019). This method is used to determine the size and type of economic activity that is located within the study area and surroundings (figure 10).

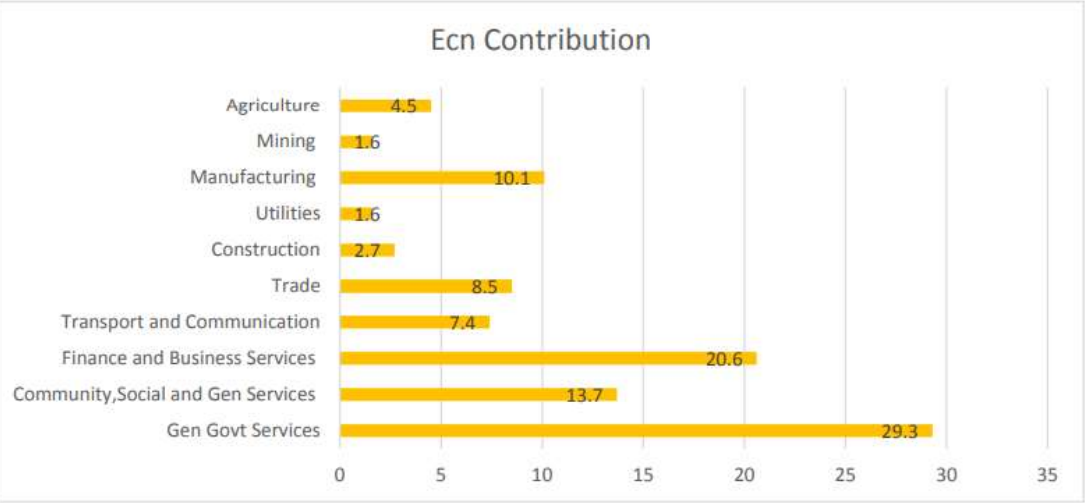


Figure 10:Local GVA Pillars in JB Marks 2011 statistics

It is evident that Potchefstroom is the largest node within the municipal area and is therefore contributes the most towards the local economy. Over the past six years the contribution of Ikageng and that of the rural areas of JB Marks have increased. The expansion of Potchefstroom outside the existing mesozone boundaries, especially around the Vyfhoek and Wilgeboom agricultural holdings and new activity within Ikageng has result in this change. It is also very clear that the tertiary sectors (retail, finance, government and infrastructure) within the Potchefstroom node is the primary contributors towards economic activity, with the Ikageng node showing the same trends on a much lesser scale. Agricultural activity is predominantly found on the outskirts of urban areas, where there is adequate space and lower land costs while consumer driven activity such as business and trade are located within urban areas.

8. Specialist Investigations

8.1. Introduction:

The compilation of this document may require niche-specific expertise, specifically in the fields of terrestrial and palaeontology. Experts in these fields have been appointed for the compilation of specialist reports which reported on the in-situ condition of the receiving environment and the anticipated impacts associated with the proposed development. This section will outline the assessment methodology and findings of the various specialist studies to be conducted (for more detailed information refer to Appendix G).

8.2. Methods:

8.2.1. Phase One Heritage Impact Assessment

The heritage significance of the affected area was evaluated on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) digital camera and camera drone were used for recording purposes. Maps and aerial photographs (incl. Google Earth) were consulted and integrated with data acquired during the on-site inspection. Site significance classification prescribed by SAHRA, were used to indicate overall significance and mitigation procedures where relevant (Table 10).

Field Rating	Grade	Significance	Mitigation
National Significance (NS	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
General Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

Table 10: Archaeological field rating categories as prescribed by SAHRA.

8.2.2. Terrestrial Ecological Assessment

A desktop study was performed prior to field surveys with emphasis on the following:

- Vegetation type verification
- Possible species occurrence verification
- Current land use through satellite imagery

Site verification surveys were conducted in July 2023, focusing on ground truthing of information acquired during the desktop study. The survey was performed by means of transects traversed on foot. Attention was given to the current state of the environment regarding grazing impacts, anthropogenic disturbances, erosion and the presence of alien or invasive species. The use of an unmanned aerial vehicle (UAV) was used to aid in identifying unique environmental features.

8.3. Summary of findings

8.3.1. Phase One Heritage Impact Assessment

The proposed development area is underlain by West Rand Group (Rh) rocks and older undifferentiated granites and gneiss (Zg) of the Witwatersrand Supergroup, considered to be of low to no palaeontological significance. Proposed activities will also impact previously degraded topsoils (farmland), not considered palaeontologically vulnerable. As far as the palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary. The development footprint is located about 13 m above the present level of the Schoonspruit and within range of 10 - 13 m gravel terraces north of Klerksdorp, known to have yielded several ESA artefacts in the past. However the current landscape has been severely degraded by previous and ongoing farming activities. Likelihood of severe impact on in situ, Quaternary fluvial deposits are considered very low.

Potential archaeological impact resulting from the proposed development will be non-existent due to the disturbed condition of the footprint. A farm graveyard situated near the southwestern boundary of the proposed footprint should be avoided, fenced off and protected by a minimum 25 m, no-go buffer zone during the construction phase of the development.

The graveyard is assigned a heritage rating of Local Significance Grade 3A (Conservation; mitigation not advised). The rest of the affected area is assigned a site rating of Low Significance (Generally Protected C). As far as the archaeological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary.

8.3.2. Terrestrial Ecological Assessment

The proposed development is located within a 15 km radius from Ventersdorp, in the North West province. As the crow flies, the proposed development is located approximately 12.5 km south west of Ventersdorp. Overall, the study area is about 16 ha on a slightly inclining slope

of a near completely agriculturally transformed landscape. Very little natural vegetation remains, with what is left, 0.18 ha, bordering the fence-line along the southern border of the property.

The study area's landscape is slightly sloping, with the slight slope ascending from the western parts of the study area to the eastern parts of the study area. Altitudes of the study area range from 1 404 m in the western border of the study area to 1 422 m in the eastern border of the study area. The description of the physical environment observed on site agree with that of the vegetation type of Mucina and Rutherford (2006) in which the study area is located (SANBI, 2006-2018).

The proposed development expansion is largely located in the Vaal-Vet Sandy Grassland (Gh 10) vegetation type (Dayaram, 2018; Mucina and Rutherford, 2006). However, the proposed development site is mostly not located within the remaining natural extent of the Vaal-Vet Sandy Grassland vegetation type (Skowno, 2021) (figure 11).

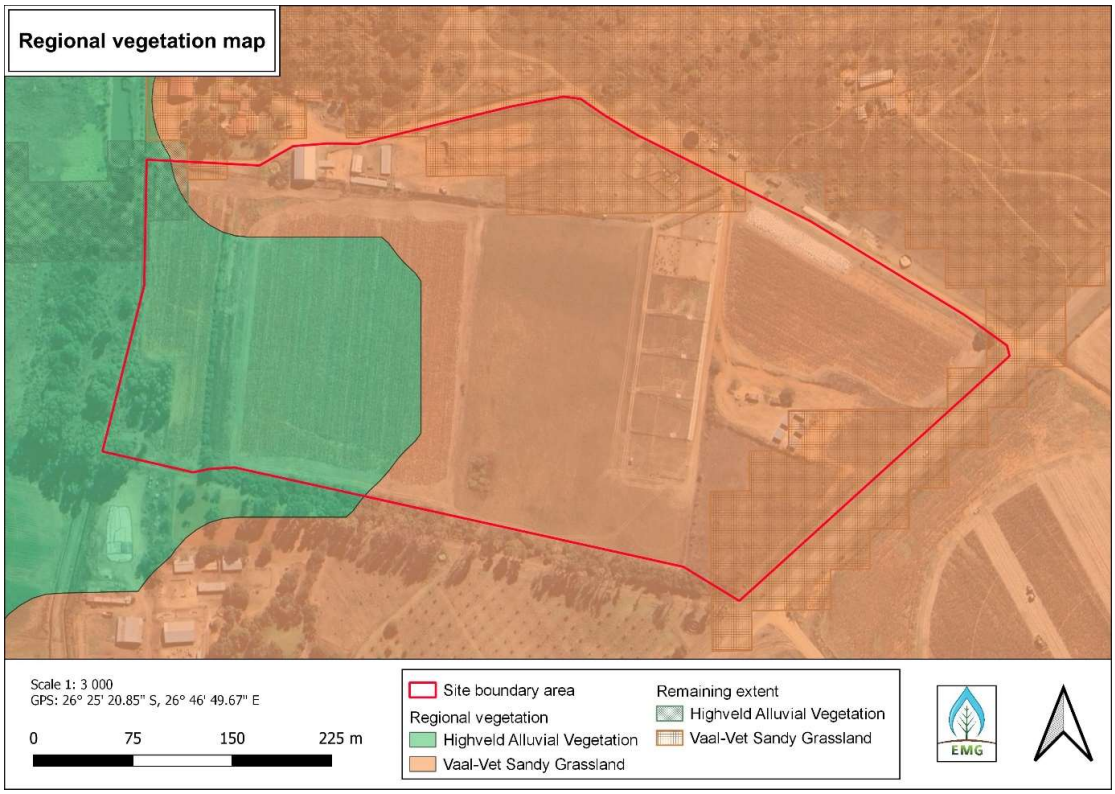


Figure 11: Regional vegetation map indicating the regional vegetation types present on the proposed development site.

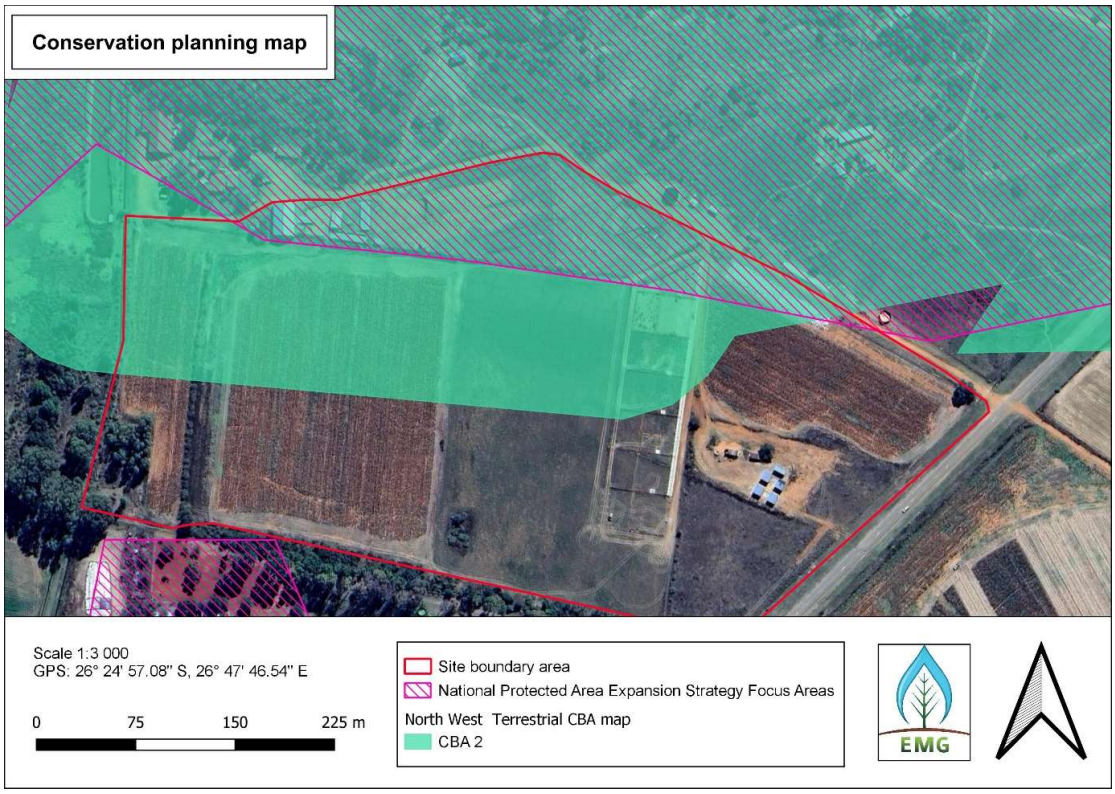
This vegetation type is characteristically representative of low-tussock grasslands that are dominated by Themeda triandra and have noticeable karroid elements. Grasses which are typically associated in a functioning Gh10 area include Anthephora pubescens, Aristida congesta, Chloris virgata, Cymbopogon caesius, Cynodon dactylon, Digitaria argyrograpta, Elionrus muticus, Eragrostis chloromelas, E. lehmanniana, E. plana, E. trichophora, Heteropogon contorts, Panicum gilvum, Setaria sphacelate, Themeda triandra and Tragus

berteronianus (Mucina and Rutherford, 2006). The only remaining grassy elements observed within the study area are Chloris virgata, Eragrostis lehmanniana, Eleusine coracana, Digitaria eriantha and Bromus catharticus. No indigenous herbs were found within the study area. Thus, the study area's floral composition and structure does not match that of Gh10.

The findings of this report and the (mostly) exclusion of the proposed development site from Gh 10's remaining extent are in agreement. Thus, the very high sensitivity of the terrestrial biodiversity theme in the DFFE screening tool due to the occurrence within an Endangered ecosystem does not agree with the findings of this report and the most recent natural vegetation remaining extent data.

Gh 10 has a conservation status of Endangered (EN) as it meets the Criterion A3 – historical reductions in geographic range which resulted in the loss of 70% of the original habitat. Only a relatively small percentage (0.7%) of the vegetation type has been conserved. This means that the vegetation type has a protection level of not protected (Skowno et al., 2019).

The proposed development area is located within a critical biodiversity area (CBA 1). However, as discussed above, the vegetation of the site is not in good ecological condition and has largely been transformed. Thus, the proposed development site cannot be classified as an area within a CBA.



tab 12: A map of the study area in relation to the map of the North West province's terrestrial critical biodiversity areas and the National Protected Areas Expansion Strategy's Focus Area map.

9. Impact Assessment and Mitigations

According to Appendix 1, Section 3 (1), of the 2014 EIA Regulations (as amended in 2017), a Basic Assessment Report must include
"(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including:

(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and

(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;

The impacts arising from the proposed development's design, construction, operation, and decommissioning phases have been assessed. A summary of the findings is presented in this chapter. Refer to Appendix J for an in-depth methodology, rationale, impacts and mitigations description.

9.1. Design and planning phase:

Activities associated with the design and pre-construction phase are primarily restricted to planning and design around the proposed development. As such, this phase relies largely upon on-site inspections and desktop assessments. Therefore, the impacts limited to this phase are considered insignificant.

9.2. Construction phase:

Impacts limited within the construction phase have far more significant consequences compared to the design, planning and operational phase of the proposed development. During this phase, the environmental impacts occur as both direct and indirect impacts associated with the disturbance of a naturally functioning ecosystem. Any disruption, whether small/concentrated or large/expansive, will adversely influence a naturally functioning ecosystem. The severity and consequences depend on the type of development, the extent of disturbance, the severity and the environment's ability to recover from such disruptions. The construction/ expansion of a cattle feedlot typically requires the displacement of certain areas, dependant on the size of the development. Clearance activities such as these could seriously impact the environment and consequently hamper the environment's ability to produce invaluable ecosystem services, which humans reap for free.

As such, the impact assessment contained within this report diligently assessed all relevant and possible environmental impacts which may be generated due to the construction of the

proposed expanded cattle feedlot.

9.3. Operational phase:

During the operational phase, much of the directly affected environment has a very low sensitivity rating that was already transformed by the expansion of the feedlot and the surrounding agricultural activity such as the existing maize fields, existing cattle feedlots and residential housing. Such interferences include higher waste generated from feedlots, soil erosion, and habitat loss. The operational phase of the proposed feedlot expansion provides an undoubtedly positive socio-economic benefit. Positive socio-economic benefits include job creation, the positive feedback luring in investment opportunities, and addressing food security.

9.4. Decommissioning phase:

It is unlikely that the proposed feedlot expansion and its associated infrastructure will be decommissioned as it is envisaged to continue for the foreseeable future. In the unlikely event of decommissioning, the impacts would be expected to be of similar degree to the construction phase, albeit likely of lower intensity and consequence.

9.5. Summary of impacts:

The table below summarises the assessed impacts and their significance pre-and post-mitigation. Refer to the full environmental impact assessment for more details.

Table 11:Environmental impact assessment summary

Impact type	Phase	Status	Significance pre mitigation	Significance post mitigation
Aspect: Ecological impacts				
Habitat loss Loss of habitat and species diversity as a result of construction and the removal natural elements.	Construction	Negative	Low	Low
	Operation	Negative	Low	Low
Invasive plant species Proliferation of exotic plant species due to environmental disturbance.	Construction	Negative	Low-Medium	Low
	Operation	Negative	Low-Medium	Low
Cumulative impacts The cumulative impact on the receiving environment's ecology regarding the proposed development total footprint.	The cumulative impacts of the ecological aspect of the proposed development are minimal due to the site's ecological status being transformed through previous infrastructure development and agricultural land use practices and the high presence of invasive plant species. No endangered species were identified on site, the surrounding area is mostly already developed into agricultural areas and although the site is located within an ESA 2, due to the above-mentioned reasons, it is not considered to be a sensitive area. The overall cumulative impacts are therefore considered to be low.			
Aspect: Heritage impacts				
The loss of artefacts and fossils Destruction of any archaeological artefacts or fossils.	Construction	Negative	Low	Low
	Operation	Negative	Low	Low

Historical structures of significance Destruction of any archaeological artefacts or fossils	Construction	Negative	Low-Medium	Low
	Operation	Negative	Low	Low
Cumulative impacts	The overall cumulative impact associated with the archaeological aspect of the proposed development are negative due to the anthropogenic disturbances during mostly the constructional phase. The proposed development will not generate any positive impacts towards the heritage aspect. The significance impact score was overall Low which can be attributed towards the location of the development which is not near any areas of archaeological importance. It is the proponent's responsibility to adhere to the mitigation measures set out for the existing graves on site.			
Aspect: Water resource impacts				
Surface and ground water quality The pollution of surface and groundwater resources due to the proposed development.	Construction	Negative	Low-Medium	Low
	Operation	Negative	Medium	Low
Cumulative impacts	The overall cumulative impact generated by the proposed development's construction phase on water resources is low due to that there are no watercourses identified close to the development site and the considering the mitigation measures are adhered to. The operational phase (50 yrs or more) will have higher impacts on the groundwater due a waste production, and storm water runoff. Strict mitigation measures will have to be followed during the operational phase.			
Aspect: Aesthetics				
Construction of infrastructure The alteration of landscape appreciation, visual	Construction	Negative	Low-Medium	Low-Medium
	Operation	Negative	Low-Medium	Low

deterioration and visual impacts from the cattle feedlot.				
Cumulative impacts	A negative impact arises from the overall significant impact due to the proposed development altering the natural landscape features of the area. The significance impact ranges from Low-Medium to Low providing that the correct mitigation measures be implemented. There will be no positive impacts generated for the aesthetic aspect due to the alteration of the natural features of the area and affecting the direct neighbours which is situated in close proximity to the proposed development.			
Aspect: Air quality and noise				
Air quality Additional air pollution introduced due to the mobilisation of vehicles and land clearance.	Construction	Negative	Low-Medium	Low
	Operation	Negative	Low-Medium	Low
Noise and vibrations Sound pollution through the operations of vehicles and equipment.	Construction	Negative	Low-Medium	Low
	Operation	Negative	Low-Medium	Low
Cumulative impacts	Overall, the cumulative impact generated from the proposed development is of negative nature as a result of anthropogenic and cattle associated activities causing disturbance and pollution of the natural environment. No positive impacts are expected to arise from the proposed development. The significance impact is considered to be Low if the proper mitigation measures are adhered to during the operational phase.			
Aspect: Socio-economic impacts				
Job creation and the influx of job seekers Impacts associated with the need for	Construction	Positive	Medium	
	Operation	Positive	Medium	

locally appointed construction/ operation workers.				
	The overall cumulative impact generated from the proposed development is of positive nature due to the possible job opportunities, increasing local spending, training, economic growth, and addresses the national food security.			
Aspect: Waste impacts				
General solid waste General solid waste pollution.	Construction	Negative	Low-Medium	Low
	Operation	Negative	Low-Medium	Low
Organic waste Land contamination	Construction	Negative	N/A	
	Operation	Negative	Medium	Low-Medium
Cumulative impacts	The new feedlots will only start to generate organic waste (manure) once the competent authority approves the project, and the construction thereof has been completed. Therefore, the construction phase does not generate any impacts related to manure production. The operational phase impacts will be Medium due to the increase of waste production, which is not effectively disposed of, and not maintaining stormwater drainage pipelines resulting in blocked pipes. It is the proponent' responsibility to ensure that the correct mitigations are implemented to lower the waste impact aspect of the proposed development to Low-Medium.			

9.6. No go alternative

The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed development. This alternative would result in no environmental impacts on the site or surrounding local area. It provides the baseline against which other alternatives were compared. The following implications will occur if the "no go" alternative is implemented:

- No benefits will be derived from the implementation of an additional land-use.
- The cattle feedlot will not provide additional food security to South Africa.
- This will further enforce more strain on the local communities.
- Socio-economic benefits such as job creation, skills development, and local economic growth will be lost.

Besides the above mentioned, the following benefits might occur if the no go alternative is implemented:

- No vegetation will be removed and or disturbed.
- No change/ alteration to the existing landscape.
- No additional waste will end up in landfill sites and within the local municipal sewage treatment system.

While the no go alternative will not generate any negative environmental impacts, it will surely remove any socio-economic benefit the local community will receive. Therefore, the no go alternative is not considered the preferred alternative.

10. Project Summary and Recommended Mitigation

EAP's Recommendation

The information within this BAR provides a detailed and comprehensive description of the proposed expansion of a cattle feedlot development, surrounding environment and potential environmental impacts associated with the proposed development. This report deals with the expansion of the cattle feedlot development and will therefore increase the current output should Environmental Authorisation is approved and received.

No significant impacts that cannot be mitigated were identified and therefore, Environmental Management Group is of the opinion that the proposed project should proceed provided that the appropriate mitigation and management measures are implemented. The environmental legislation of South Africa requires that the applicant is accountable for the potential impacts of the activities that occur and is responsible for the management of these impacts. It is the applicant's responsibility to ensure that the implementation of the construction phase of the EMPr complies with the relevant legislation and the conditions stated by the environmental authorisation. The applicant will thus be responsible for the implementation of the EMPR. The environmental management programme (EMPR) should form part of the contract between the construction company and the applicant. This will help ensure that the EMPR is adhered to.