




Environmental
Management
Group (Pty) Ltd.

**IMPACT ASSESSMENT
FOR:
PROPOSED CATTLE
FEEDLOT ON PORTION 38 OF
THE FARM STERKFONTein
423-IR, MEYERTON,
GAUTENG PROVINCE.**


Prepared for:


Applicant:	River Valley Beef (Pty) Ltd
Contact person:	Stef Valle
Number:	082 374 4475
E-mail:	Stefvalle1@gmail.com
Address:	113 Klipplaatdrift, Vereeniging, 1939

Prepared by:

EAP:	Chantelle Barendse Junior Environmental Practitioner Environmental Management Group
E-mail:	cb@envmgrp.com
Postal Address:	P.O Box 37473 Langenhovenpark 9330
Signature	

Reviewed by:

Specialist:	Ricus Nel Ecologist and Environmental Specialist Environmental Management Group
E-mail:	rnel@envmgrp.com
Postal Address:	P.O Box 37473 Langenhovenpark 9330
Signature	

Specialist:	Sampie van Rooyen Director and Senior Environmental Practitioner Environmental Management Group
E-mail:	svr@envmgrp.com
Postal Address:	P.O Box 37473 Langenhovenpark 9330
Signature	

Contents

1. Introduction:	3
2. Methodology:	3
2.1. Determination of consequence:.....	3
2.2. Determination of overall environmental significance:	6
3. Impact assessment for the preferred alternative:.....	8
3.1. Ecological impacts:	8
3.2. Heritage:	13
3.3. Water resources:.....	15
3.4. Aesthetics:.....	17
3.5. Air quality and noise:.....	19
3.6. Socio-economic:.....	21
3.7. Waste:.....	23
3.8. No go alternative:	26

1. Introduction:

The social and environmental impacts assessment generated by the proposed **cattle feedlot in Meyerton, Gauteng Province** is presented as the risk assessment methodology and associated results. This process aims to identify possible impacts associated with the proposed development and evaluate their significance to ensure appropriate mitigation is applied. The recommendations of suitable mitigation measures that should be implemented to reduce the consequences of likely impacts associated with the project have been formulated by industry best practice principles, professional experience, and relevant legislation.

2. Methodology:

Management and risk assessment plays a key role in the proponent's business. Managing the risks must be integrated into day-to-day business-related processes to ensure that both operational and strategic decisions are risk-based. The risk management system provides a framework to identify both threats and opportunities. The system then compensates and initiates resources that are allocated to treat the risks. It is required to review the risks as an ongoing process and then proceed to review the efficacy of the controls.

The risk assessment comprises quantifying the magnitude of potential impacts and the likelihood of these impacts to occur. The Consequence (**C**) and Likelihood (**L**) matrix combine the qualitative and or semi-quantitative ratings of consequence and the likelihood that a specific consequence will occur to calculate a risk score and risk rating (Equation 1). Essentially, the greater a probability of an adverse impact occurring, the greater the risk level associated with it will be.

C = Overall consequence

L = Likelihood of occurrence

Equation 1: Calculation of environmental significance.

$$\text{Environmental Significance} = C \times L$$

2.1. Determination of consequence:

Consequence analysis is a combination of quantitative and qualitative information, and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: **Severity/Intensity**, **Duration** and **Extent/Spatial Scale**. Each factor is assigned a rating between 1 to 5, as described in the tables below.

2.1.1. Determination of intensity:

Intensity relates to the nature of the event, aspect or impact to the environment and describes how intense a given aspect's impact on the biophysical and socio-economic environment will be.

Table 1: Rating criteria describing the intensity of a given aspect.

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant / Harmful	Great / Very harmful	Disastrous / Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance / Easily reversible	Low cost to mitigate	Substantial cost to mitigate / Potential to mitigate impacts / Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate / Little or no mechanism to mitigate impact / Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Medium change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

2.1.2. Determination of duration:

Duration refers to the amount of time the receiving environment will be exposed to a given aspect, risk or impact, given the absence of intervention/mitigation.

Table 2: Rating criteria for determination of duration

Rating	Description
1: Low	1 Month
2: Low-Medium	1 – 3 Months
3: Medium	More than 3 Months
4: Medium-High	5 – 10 Years
5: High	More than 10 Years

2.1.3. Determination of extent/spatial scale:

Extent refers to the spatial influence of an impact, be it contained to the immediate surroundings (site), extending to the surrounding area, regional (will have an impact on the region), national (will have an impact on a national scale) or international (impact across international borders).

Table 3: Rating criteria for the determination of extent/spatial scale

Rating	Description
1: Low	Immediate, fully contained area (site)
2: Low-Medium	Surrounding area
3: Medium	Regional
4: Medium-High	National
5: High	International

2.1.4. Determination of overall consequence:

The overall consequence is determined by calculating the sum of all impact factors described above and those summarised below, divided by the total number of impact factors (three) (Equation 2).

I = Intensity

D = Duration

E = Extent

n = number of factors

Equation 2: Calculation of overall consequence.

$$\text{Overall Consequence} = \frac{\sum(I+D+E)}{n}$$

2.1.5. Determination of likelihood:

Likelihood refers to the probability of a given aspect/impact to occur given that no mitigation measures are implemented.

Table 4: Rating Criteria for the determination of likelihood.

Rating	Description
1: Low	< 30% chance of occurrence
2: Low-Medium	30% - 50% chance of occurrence
3: Medium	50% - 70% chance of occurrence
4: Medium-High	70 – 90% chance of occurrence
5: High	>90% of occurrence

2.2. Determination of overall environmental significance:

2.2.1. Quantitative analysis of the overall environmental significance:

The overall environmental significance is determined by multiplying the overall consequence (**C**) by the likelihood of occurrence (**L**) (Equation 1). The rationale of the overall environmental significance relates to identifying and quantifying the sum of environmental impacts arising from the proposed development and the recommendation of appropriate mitigation measures.

Table 5: Environmental significance evaluation score sheet.

Aspect	Specific	Low	Low-Medium	Medium	Medium-High	High
Overall Environmental significance	Consequence x Overall Likelihood (<i>Equation 1</i>)	1-5	6-10	11-15	16-20	21-25

2.2.2. Qualitative description or magnitude of the environmental significance:

The qualitative description of environmental significance attempts to provide an indication of the nature and or magnitude associated with the proposed development. It also guides the prioritisation and decision-making process related to this event, aspect or impact.

Table 6: Rating criteria for impact significance.

Significance	Low	Low-Medium	Medium	Medium-High	High
Impact Magnitude	Impact is of very low order and therefore likely to have very little real effect. Acceptable.	Impact is of low order and therefore likely to have little real effect. Acceptable.	Impact is real, and potentially substantial in relation to other impacts. Can pose a risk to the company	Impact is real and substantial in relation to other impacts. Pose a risk to the company and environment. Unacceptable	Impact is of the highest order possible. Unacceptable. Fatal flaw.
Action Required	Maintain current management measures. Where possible improve.	Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where possible improve	Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible.	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.

3. Impact assessment for the preferred alternative:

3.1. Ecological impacts:


The ecological impact assessment takes into consideration the site's natural condition and any sensitivities, in terms of habitat diversity, species diversity and ecological diversity. The flora impact assessment refers to the vegetative component of the assessed area and focuses on the degree of infestation by exotics, vegetation structure, endemics, and protected species. The fauna impact assessment refers to the animal component and focuses on the available habitats, resources and protected species.

Habitat loss							
Impact	Loss of habitat and species diversity as a result of construction and the removal of natural elements.						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> Physical clearance. Construction of new internal access roads. Trampling Off roading 		<ul style="list-style-type: none"> Habitat fragmentation leading to edge effects. Illegal harvesting of plant material. Habitat degradation. 				
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	3	1	2	4	8
Mitigation	<ul style="list-style-type: none"> Removal of indigenous vegetation should be kept to a minimum. Disturbance related activities must be restricted to the authorised development site. Prioritise the use of existing service roads. No off-roading or reckless driving should be allowed. Post-construction open areas should be rehabilitated and revegetated with indigenous vegetation. No harvesting of plant material should be allowed. No illicit fires may be allowed during construction. A fire management plan should be drafted and kept on site for all phases of the development. Littering should be prohibited. No burning of any material is allowed on site. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	1	2	1	1	2	4

Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	3	2	3	3	9
Mitigation	The operational phase of the cattle feedlot development is anticipated to generate medium impacts which may lead to habitat loss less than what was already lost during the construction phase. There will be movement of vehicles and / or people during the operational phase as this is associated with feedlot operational activities. Rehabilitation of disturbed areas should be implemented, where possible.						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	3	1	2	2	4
Additional Notes:	Construction footprint to be demarcated as per the construction phase conditions						

The environmental impact on habitat loss during constructional phase will be **Low-Medium** without mitigation and **Low** when mitigation measures are applied. This risk assessment for the operational phase will be **Low-Medium** prior to mitigation and **Low** after mitigation and is described as having a low order impact. It is necessary to implement monitoring and evaluation procedures to determine the potential of increase in risk. It remains important for the applicant to be cognisant of activities which may cause damage to the natural environment which exceed the development area. Aspects which may cause damage outside the authorised development area include but are not limited to veld fire's, water pollution, plastic pollution etc. The applicant is to take steps which greatly limit the potential of such adverse impacts to occur. It is necessary to implement monitoring and evaluation procedures to determine the potential of increased risk throughout the phases of this development.

Invasive plant species							
Impact	Proliferation of exotic plant species due to environmental disturbance.						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> Improper eradication methods on existing exotics. Physical clearance providing opportunity for opportunistic exotics to proliferate. Accidental spread. Disruption of ecological balance due to habitat disturbance. Slow response to infestation eradication. Landscaping with exotics. 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	3	2	3	3	9
Mitigation	<ul style="list-style-type: none"> Stockpiles need to be eradicated from all vegetation on a three-monthly basis. Disturbance related activities may not exceed the authorised development boundary. The appointed ECO should liaise with the contractor and developer and compile an alien invasive species management plan if required. Exotics may not be allowed to proliferate within the development area. All invasive species within 30 m of the development area need to be managed in accordance to sustainable management practices. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance

	Negative	2	3	1	2	2	4
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	5	2	4	3	12
Mitigation	 All open spaces post-construction needs to be rehabilitated with indigenous species.						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	3	1	2	2	4
Additional Notes:							
Contain the natural environment and ensure the Environment Management Plan is adhered to.							

The impact that invasive plant species will have during constructional phase is estimated to be **Low-medium** without mitigation and **Low** when mitigation measures are implemented. This risk assessment for the operational phase is estimated to be **Medium** prior to mitigation, and **Low** after mitigation measures are implemented. It is necessary to implement monitoring and evaluation procedures to determine the potential of increase in risk.









Loss of floral and faunal SCC							
Impact	The loss of floral and faunal species of conservation concern as a result of the proposed development.						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> Physical clearance Poaching Reckless / off road driving Isolation of sub-populations Behavioural disruption 		<ul style="list-style-type: none"> Construction of internal roads Habitat disturbance, fragmentation. Road collisions Electrification 				
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	3	2	4	3	12
Mitigation	<ul style="list-style-type: none"> All construction personal need to be informed on floral and faunal SCC. All protected flora needs to be demarcated and barricaded. Demarcation netting around protected flora need to be maintained until the relevant permits for removal/ relocation are obtained. Staff should immediately inform the on-site environmental representative and a relevant specialist if any floral SCC are observed. Development may only occur within the authorised development boundary. Monitoring for the emergence of exotic species should be conducted on a three-monthly basis. No unnecessary destruction or removal of vegetation may be allowed. Wildlife elements such as nests and burrows should carefully be inspected prior to construction. Such elements may only be responsibly removed by a relevant specialist. No hunting, trapping, or killing of fauna is allowed. Animals that get trapped in trenches need to be removed by the on-site environmental officer. The on-site environmental officer should be in possession of the relevant animal handling certificates. Vehicle movement should strictly be contained on designated roads. No off roading must be allowed. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	3	1	2	2	4
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	5	1	3	2	6
Mitigation	Notice boards should be erected displaying information on the potential occurrence of protected species. During construction, if a protected species is observed, a relevant specialist should be consulted.						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	5	1	3	1	3
Additional Notes:	During the site visit <i>Hypoxis hemerocallidea</i> have been observed.						

The impact assessment related to the loss of protected fauna and flora during the constructional phase prior to mitigation is considered to be **Medium** and **Low** after mitigation. The loss of protected fauna and flora during the operational phase prior to mitigation is considered **Low-medium** and **Low** after mitigation. The impact

assessment considers the related loss of protected species as a low order impact due to the already degraded condition of the site.

3.2. Heritage:

The heritage theme involves culturally significant finds including, but not limited to fossils, artefacts and certain culturally relevant infrastructure. Details concerning the heritage theme is discussed in detail within the Phase 1 Heritage Impact Assessment.

Artefacts and Fossils							
Impact	Destruction of any archaeological artefacts or fossils						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> Excavation within lower geological strata. Illegal collecting of loose chance finds (e.g. Stone age artefacts) 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	5	1	3	1	3
Mitigation	<p> SAHRA and a qualified archaeologist be consulted immediately in the event of accidental archaeological exposure.</p> <p> In the unlikely event of accidental archaeological exposure, all excavations should stop immediately.</p> <p> No loose chance finds such as stone age artefacts (arrow heads, stone flake blades etc.) may be collected.</p> <p> The on-site environmental representative should consult the appointed ECO regarding any such discoveries.</p> <p> All construction debris/ waste should be removed from site and may not be deposited in on-site excavated waste pits.</p>						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	3	1	2	1	2
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	2	1	2	1	2
Mitigation	<p> No loose chance finds such as stone age artefacts (arrow heads, stone flake blades etc.) may be collected.</p> <p> The on-site environmental representative should consult the appointed ECO regarding any such discoveries.</p> <p> No unauthorised excavations, post construction may be allowed.</p>						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	2	1	2	1	2
Additional Notes:	According to the Phase 1 HIA report: The applicant and contractor should remain cognisant of this statement. Responsible excavation and other construction related activities which reduces the likelihood of impacting heritage resources should always be implemented.						

The Paleoanthropological specialist indicated that the potential of finding any paleoanthropological resources of significant concern (Fossils and associated artefacts) is very low. The specialist further requested exemption from further investigation relating to this aspect. The overall impact on these historical resources is considered **Very Low**.

The odd chance of finding loose surface scatters such as stone age arrow heads and stone flake knives were regarded by the HIA specialist as being of **Low significance**. Nonetheless, a conservative approach needs to be retained as this prevents heritage resources from being viewed in a casual light.

The overall impacts on archaeological components will be of **Low** order prior to any mitigation and **Low** after mitigation. These low scores are attributed to the low likelihood of finding fossils and artefacts of historical significance and the absence of above ground evidence of historically significant structures. Mitigation measures as indicated should be implemented.

Heritage cumulative impacts
The overall cumulative impact associated with the archaeological aspect of the proposed development are negative due to the anthropogenic disturbances during mostly during 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.

3.3. Water resources:

The water resource theme includes all aspects of freshwater including surface and groundwater resources. Water quality and quantity are two crucial components that are evaluated.

Surface and ground water quality							
Impact	The pollution of surface and groundwater resources due to the proposed development.						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> • Removal of riparian vegetation • Soil erosion • Manure runoff and other forms of water pollution (refer to organic waste in 3.5) 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	3	1	3	2	6
Mitigation	<ul style="list-style-type: none"> 🚰 A stormwater management plan should be implemented to avoid the increased runoff from eroding soils. 🚰 Soil erosion prevention should be implemented. 🚰 Feedlot infrastructures may not be placed within watercourses. 🚰 Chemical toilets must be available during construction. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	2	1	2	1	2
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	3	2	3	4	12
Mitigation	<ul style="list-style-type: none"> 🚰 A monitoring programme should be drafted and maintained by the proponent or responsible person operating the feedlot. This monitoring programme should monitor changes in the various watercourses which'll be affected by the development. 🚰 A baseline groundwater test should be conducted, and annual tests thereafter should be implemented to assess the possibility of groundwater pollution. 🚰 No pollution causing activity may occur near streams/rivers. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	3	1	2	2	4
Additional Notes:							

The major risk to groundwater quality will be associated with activities on the surface such as manure runoff which could infiltrate over a period of time into the aquifer, which, depending on the size of the runoff and if mitigation measures are adhered to, can contaminate the whole aquifer. It is thus crucial to exercise mitigation measures during such incidents to avoid other groundwater users in the area being negatively affected by poor quality water. During the construction phase of the development, it is estimated that the impact on surface and groundwater quality is of **Low-medium** order prior to mitigation and **Low** after mitigation. During the operational phase it is

calculated that the impact on water resources will be of **Medium** order prior to mitigation and **Low** after mitigation. A comprehensive stormwater plan should be implemented to prevent concentrated organic waste (manure) from entering lower soil strata. The mitigation measures included in this impact assessment and those identified in the BAR should be followed.

Water resources cumulative impacts
The overall cumulative impact generated by the proposed development on water resources prior to implementing mitigation measures is calculated to be of Medium order significance. Adequate mitigation measures will lower the overall environmental impact to a Low impact significance. The proposed development will not lead to any positive impacts associated regarding water resources aspect due to the disturbance of a natural functioning aquatic ecosystem. The overall impact of the proposed development is negative in nature, although the development would not occur close to a watercourse.

3.4. Aesthetics:

The aesthetic theme is focused on the alteration of the visual characteristics of the area and overall impact on landscape appreciation. Landscape appreciation is inherently subjective with few metrics allowing for an objective impact assessment. However, several aspects concerning visual impacts associated with feedlot developments may be objectively assessed. These include development size, aesthetic deterioration due to construction, and line of sight distance.

Construction of Infrastructure							
Impact	The alteration of landscape appreciation, visual deterioration and visual impacts from the feedlot development.						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> • Construction • Generation of construction debris / waste • Temporary waste dump areas • Visual impairments from feedlot structure • Removal of vegetation • Alteration of the overall landscape perspective 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	3	3	4	5	20
Mitigation	<ul style="list-style-type: none"> 🔗 Construction debris should be removed regularly and not allowed to pile up. 🔗 A designated construction waste area should be placed. 🔗 All domestic waste and construction debris should be removed to a designated waste landfill site. 🔗 A Complaints register needs to remain on site in which all complaints raised by the general public is to be filed. 🔗 Construction should finish as quickly as possible. 🔗 All open spaces after construction need to be revegetated. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	3	3	4	3	12
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	4	2	4	4	16
Mitigation	<ul style="list-style-type: none"> 🔗 All operational activities should strictly be concentrated on the proposed site. 🔗 Rehabilitation of all open spaces after construction. 🔗 A Complaints register needs to remain on site in which all complaints raised by the general public is to be filed. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	4	2	3	3	9
Additional Notes:							

The risk to the aesthetic value of the surrounding environment during the constructional phase of the development is rated to be **Medium-High** before mitigation and **Medium** after mitigation. The low scores were assigned due to the placement of the new feedlots on farm ground with the nearest neighbour being more than 1 km

from the physical footprint of the development. The operational phase of the proposed development generates a slightly higher visual impact. During the operational phase the impact on the surrounding aesthetic value of the area is considered **Medium-High** prior to mitigation and **Medium** after mitigation.

Aesthetics 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 Medium-high to – Low medium 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.






3.5. Air quality and noise:

Noise and air quality assessments are based upon the type of equipment being used during a specific activity and the degree of disturbance that will occur. Air quality is further impacted by emissions emanating from the proposed development.

Air quality							
Impact	Additional air pollution introduced due to the mobilisation of vehicles and land clearance and the smell of cattle manure.						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> Elevated dust emissions due to increased vehicle movement Vegetation clearance and the construction of internal dirt roads. Manure production and associated smell. 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	3	2	2	3	6
Mitigation	<ul style="list-style-type: none"> Watering bare surfaces and excavations to promote dust suppression Enforce speed limit of 30km/h and optimization of working schedule to reduce vehicle mobilization. Limit the amount of vegetation clearance. The construction of new dirt roads should be restricted by prioritising existing roads. Development should remain within the authorised area. Construction should be completed as soon as possible 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	3	1	2	2	4
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	4	2	3	3	9
Mitigation	<ul style="list-style-type: none"> Enforce speed limit of 30km/h and optimization of working schedule to reduce vehicle mobilization. Parking areas should be demarcated and strictly controlled so that vehicles are limited to specific areas only. Implement biofilters or vegetative buffers around the feedlot to help capture and absorb odorous compounds. Planting trees, shrubs, and other vegetation can help filter and neutralize odours. Promptly remove and properly manage manure to minimize the contact with air. This can be achieved through frequent manure removal which reduces the production of odorous gases. Keep the feedlot clean by regularly removing manure and waste materials. Cleaning pens assists in the prevention of the buildup of odour-causing compounds. Use proper manure storage facilities such as lagoons to reduce odour emissions. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	4	1	2	2	4
Additional Notes:							

Air quality will be impacted due to the movement and activities of construction vehicles and the increased production of manure during the operational phase of the proposed development. Due to the distance of the nearest neighbour, the nature of these activities confirms that it is not foreseen that these impacts will significantly alter the air quality of the environment. Air quality and the risks involved will have an insignificant impact on the environment. The impacts for the constructional phase of the proposed development are considered **Low-medium** prior to mitigation and **Low** after mitigation measures have been implemented. The impacts for the operational phase are considered to be **Low-medium** before mitigation and **Low** after mitigation. It is important that all the necessary mitigation measures are implemented, especially during the operational phase of the development. It remains the responsibility of the applicant to frequently investigate and assess the implementation of industry best practice mitigation measures to limit the overall impact on air quality.

Noise and vibrations							
Impact	Vehicles and equipment utilized, noises associated with cattle.						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> Noise generated through construction related activities. Vibrations generated due to the utilisation of construction equipment. Noises of cattle in the feedlot pens. 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	3	2	2	3	6
Mitigation	<ul style="list-style-type: none"> No loud music allowed Vehicles must be maintained in such a manner as to not cause excessive noise when operating them Select 'quiet' construction equipment and working methods by avoiding unnecessary revving and hooting Working schedule for activities with high noise levels will be limited to 08:00 AM to 17:00 PM, machinery should be serviced regularly during the construction stage. Equipment should be regularly serviced. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	1	3	1	2	2	4
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	4	1	2	3	6
Mitigation	<ul style="list-style-type: none"> No loud music allowed Vehicles must be maintained in such a manner as to not cause excessive noise when operating them No unnecessary hooting and revving Implement scheduling and operational practices that minimize noisy activities during periods when noise-sensitive areas are most affected, such as early morning or late at night. 						

	<ul style="list-style-type: none">  Adequate signage and speed bumps must be provided around the feedlot development limiting fast vehicle movement and avoid simultaneous noisy activities.  Utilize natural barriers like trees, shrubs, and earthen berms to help block and absorb sound.  Create buffer zones between the feedlot and neighbouring properties. These areas can be planted with vegetation that acts as a noise barrier.  Properly manage animal handling and movement to minimize noise. This could involve using quieter techniques and equipment.  Consider grouping animals based on behaviour and size to reduce vocalizations and stress-related noise. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	4	1	2	3	6
Additional Notes:							



Ambient noise will temporarily be impacted due to construction activities. It is considered unlikely that any significant environmental impact will arise due to these activities considering their temporary nature and the site's locality on a farm. During the construction phase the environmental impact on ambient noise is considered to be **Low-medium** before mitigation and **Low** after mitigation. During the operational phase the environmental impact on ambient noise is estimated to be of **Low-medium** grade before mitigation and **Low-medium** after mitigation.

The anticipated impact on local noise and air quality is calculated to be of **Medium** order significance without mitigation and **Low-medium** after the implementation of mitigation measures. The direct impacts on the local community concerning noise and air quality generated by cattle in the feedlot will not be significant due to the distance to direct neighbours.

Air quality and noise cumulative impacts
Overall, the cumulative impact generated from the proposed development is of negative nature as a result of anthropogenic 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 Medium to Low medium if the proper mitigation measures are adhered to during the operational phase.

3.6. Socio-economic:

Socio-economic impacts focus on the effects the development will have on the economic drivers in the surrounding area as well as emphasising the integration of economic development concerning the needs of the people.

Job creation and the influx of job seekers							
Impact	Impacts associated with the need for locally appointed construction/ operation workers.						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Positive	4	3	2	3	4	12
Mitigation							
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Positive	4	3	2	3	4	12
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Positive	3	5	2	3	3	9
Mitigation							
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Positive	3	5	2	3	3	9
Additional Notes:	 Routine maintenance of feedlot and associated infrastructure creates job opportunities for the local businesses  Construction creates job opportunities which can include the training of local youth						

The proposed cattle feedlot construction and operation provides for several socio-economic benefits such as local job creation, boosting local spending, skills training, and addresses the national food security of South Africa. It is therefore considered that construction phase of this project will have a **Medium** positive impact on the local socio-economic sphere and the operational phase whereas the operational phase of this development will have a **Low-Medium** positive impact.

Socio-economic aspect cumulative impacts
The overall cumulative impact generated from the proposed project is of positive nature due to the possible job opportunities, increasing local spending, food security for the growing local population, and economic growth, and addressing food security for the growing local population.

3.7. Waste:

Waste management refers to the types of waste being generated by the proposed development. This theme also investigates environmental impacts generated by the development concerning specific waste management strategies employed throughout all phases of the project.

General solid waste							
Impact	General solid waste pollution						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> General construction waste such as plastic items, cement bags, construction scrap etc. Designated temporary construction waste dump area. General operational waste (plastic items, paper, broken panels / equipment etc.) Waste removal management. 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	3	2	3	3	9
Mitigation	<ul style="list-style-type: none"> Reduce, reuse and recycle strategy needs to be implemented. Waste receptacles must be made available, and all waste shall be adequately stored and removed. All waste management strategies employed by the contractor should comply with environmental / waste management legislation. Waste that can easily be dispersed by wind should be appropriately discarded in bins with lids. Waste should be regularly removed from the site to a registered landfill. The contractor should develop and comply to a on-site specific waste management plan. No waste may be buried in an on-site waste pit. No burning of waste material on site. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	3	1	2	2	4
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	4	2	3	3	9
Mitigation	<ul style="list-style-type: none"> General waste generated during routine maintenance should be transported to a designated waste storage area and may not be burned. Waste should be transported to a registered landfill site. General waste should also be removed from the site and not pile up. 						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	2	4	1	2	2	4
Additional Notes:							

The impact that general waste production will have during construction is estimated to be **Low-medium** before mitigation and **Low** when mitigation measures are implemented. The impact general waste production will have during the operational phase is considered **Low-medium** before mitigation and **Low** after mitigation measures have been implemented. It is necessary to implement monitoring and evaluation procedures to determine the potential of increase in risk over the duration of the facilities operation.




Organic waste (manure)							
Impact	Land contamination						
Activities (Not an all-inclusive list)	<ul style="list-style-type: none"> General construction waste such as plastic items, cement bags, construction scrap etc. Designated temporary construction waste dump area. Waste removal management. 						
Constructional Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	N/A						
Mitigation	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.						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	N/A						
Operational Phase							
Before Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	4	4	1	3	4	12
Mitigation	A comprehensive stormwater management network should be implemented and regularly inspected for faults. The stormwater channels should be lined with clay to prevent seepage. The sedimentation pond, evaporation pond and the temporary storage/drying area should be lined with concrete. Dried manure should not be unutilised for more than four months. Unutilised manure stockpiles should be transported to the nearest landfill site.						
After Mitigation	Status	Severity	Duration	Extent	Consequences	Likelihood	Significance
	Negative	3	4	1	3	2	6
Additional Notes:	The waste management strategy must include the reduce, reuse and recycle model. Health and safety regulation should be followed.						

Waste cumulative impacts	
Overall, the cumulative impact generated by the proposed project on the waste aspect of the environment is negative in nature. The main cause of this is rooted in	





the anthropogenic activity during the construction phase resulting in the increase of waste generated and the generation of manure during the operational phase of the proposed development. A comprehensive stormwater plan should be implemented to prevent concentrated organic waste (manure) from entering lower soil strata. The overall significance of this development ranges from **Low medium** to **Low** which generates a negative impact associated with this development. Most of these impacts may be easily mitigated resulting in a **Low-medium** impact significance.

3.8. 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:

-  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.
-  The ecology will remain largely intact.
-  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. The no go alternative will also not aid the government in addressing climate change, reaching its greenhouse gas emission targets, and will further place more strain on the existing electrical grid. Therefore, the no go alternative is not considered the preferred alternative.

3.9. Conclusion

The overall aspects associated with the proposed development is considered to be of negative nature although implementing adequate mitigation measures generates a lower significance impact on the various aspects.