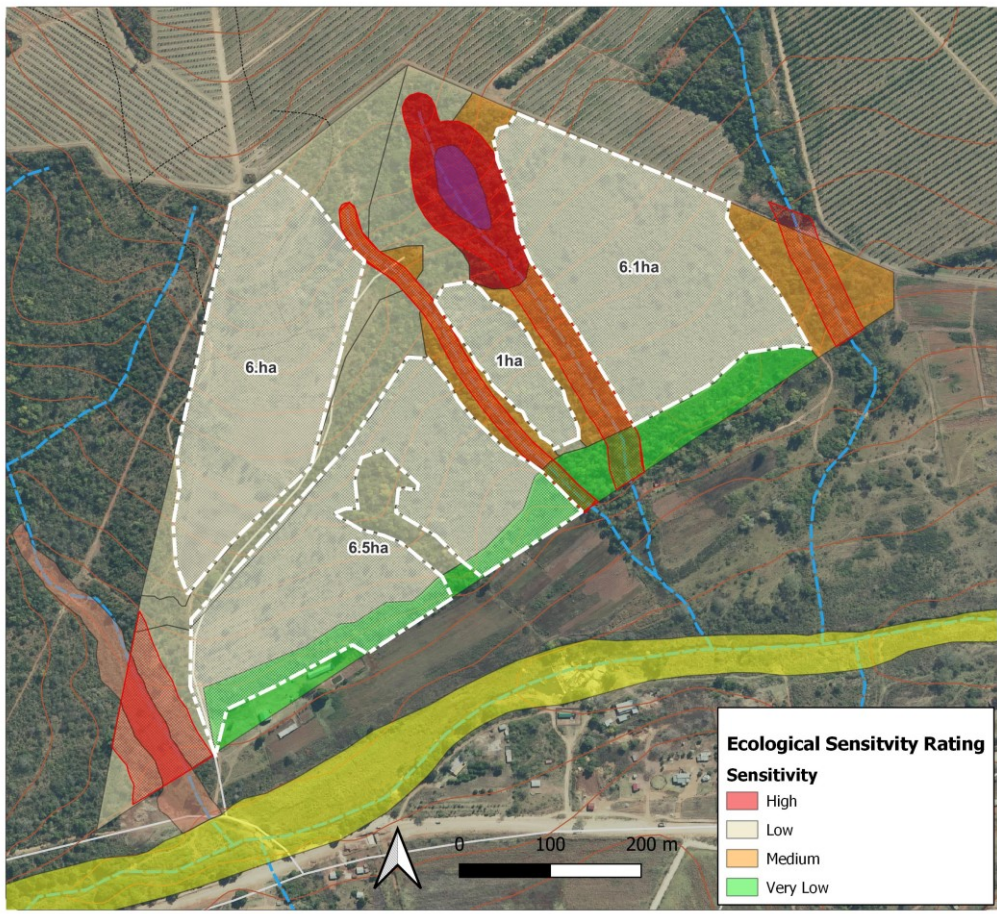


October 2022

FINAL BASIC ASSEFSMENT REPORT FOR THE PROPOSED CLEARING OF INDIGENOUS VEGETATION AND CULTIVATION ON THE FARM UGUHLENI 698 JT.



Legend

Proposed Development
Proposed Fields

Cadastral
Uguhleni 698 JT

Sensitivities
River Lines
Ecological Buffer (20m)

Aquatic Delineation
Farm Dam
Seep
Upper Foothill
Valley Bottom
Contours (5m)

Roads
Road

Project:
PROPOSED CLEARING OF INDIGENOUS VEGETATION AND CULTIVATION ON THE FARM UGUHLENI 698 JT.

Title:
**Version_01
15 August 2022**

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Compiled for:
Barberton Valley Plantations



PROJECT DETAILS

FILE REFERENCE NUMBER: 1/3/1/16/1E - 411

TITLE: Clearing and cultivation of indigenous vegetation (19.6ha) on the Farm Uguhleni 698 JT.

ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER: Anne-Mari White

AUTHOR: Steven Henwood (Nat Dip. Nature Conservation)
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PROJECT NAME: Clearing and cultivation of indigenous vegetation (19.6ha) on the Farm Uguhleni 698 JT.

REPORT STATUS: Final

REPORT NUMBER: 01

SUBMISSION DATE: October 2022



STEVEN HENWOOD
(Nature Conservation Diploma)



ANNE-MARI WHITE
(EAPASA reg: 2020/602)



agriculture, rural development,
land & environmental affairs

MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

Basic assessment report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014.

(For applicant / EAP to complete)

File Reference Number:

1/3/1/16/1E - 411

Project Title:

The clearing and cultivation of approximately 19.6 ha of indigenous vegetation on the Farm Uguhleni 698 JT

Name of Responsible Official:

Thokozile Sithole

(For official use only)

NEAS Reference Number:

--

Date Received:

--

SECTION A: EXECUTIVE SUMMARY

Henwood Environmental Solutions, as Independent Environmental Consultants and Impact Assessors, has been appointed by Barberton Valley Plantations, to conduct the Environmental Impact Assessment for the proposed clearing and cultivation of approximately 19.6 ha on the Farm Uguhleni 698 JT.

The project proposal has been informed by intensive planning so as to ensure that this proposed activity has a minimal negative impact, while promoting positive impacts, on the receiving environment. There are no locality alternatives for this project. The inputs received during Public Participation as well as those highlighted through consultation with various authorities, were used to revise and further inform specifics related to the development.

Specialist studies related to the terrestrial ecology, wetland ecology as well as the historical environment were commissioned.

In this regard, various mitigation measures have been recommended to minimize impacts. Furthermore, these measures have been incorporated into the Basic Assessment Report (Final) and Draft Environmental Management Plan.

Public Participation

Public participation forms an integral component of the EIA process. The public participation process for the project initiation and Final Basic Assessment Phase is outlined in detail in Section 4 of this report.

The approach adopted for the BAR phase of the project was to liaise predominantly with registered I&AP's or those directly affected by the proposed activities. Consequently, subsequent correspondence has only been directed to registered I&AP's and commenting Authorities.

The public participation process to date has entailed the following key components:

- Placing an advertisement in the Lowvelder (English). This advertisement served to advertise the proposed development and associated EIA process while inviting all potential I&AP's to register as I&AP's.
- Erecting site notices at the entrance to the site as well as in prominent places on the site's boundary.
- Lodging copies of the Draft Basic Assessment Report, for public review and comment.
- Submission of the draft BAR to all departments and registered I&AP's for review and comment, from 22 September to the 22 October 2022.

Key Environmental Issues

The assessed impacts were identified in the planning phase and have been subjected to detailed investigation and assessment. These impacts include potential biophysical and social impacts that may arise during the operational phase of the proposed activities (i.e. long-term impacts) and construction phase impacts (i.e. short-term impacts).

The methodology was developed by Henwood Environmental Solutions and has been continually refined and improved based on our experience in applying it to many EIA processes. The methodology is broadly consistent to that described in the NEMA EIA Regulations and in the DEA Guideline Document for these regulations (DEAT, 2006).

Each issue identified for the proposed study area was taken into consideration in order to ascertain the most suitable layout that has the least possible impacts, or the most manageable impacts, on the environment.

The following table summarises the significance of the identified potential impacts (i) before mitigation; and (ii) once recommended mitigation measures are in place.

Ref. (Pg)	Description of impact	Significance of Impact	
		Without Mitigation	With Mitigation
Construction Phase Impacts			
60	Fauna and Flora	Medium (-)	Low (-)
62	Aquatic Ecosystems	Medium (-)	Low (-)
Error! Bookmark not defined.	Historical	Low (-)	Low (-)
66	Loss of Topsoil and Soil Erosion (Hydrological)	Medium (-)	Low (-)
67	Ground and Surface Water Impact	Medium (-)	Low (-)
68	Noise Pollution	Medium (-)	Low (-)
69	Visual Impact	Medium (-)	Low (-)
70	Employment Opportunities	Low (+)	High (+)

Ref. (Pg)	Description of impact	Significance of Impact	
		Without Mitigation	With Mitigation
Operational Phase Impacts			
72	Stormwater Management	Moderate (-)	Low (-)
73	Visual Impact – “Sense of Place”	Low (-)	Medium (+)
59	Use of pesticides	Medium (-)	Low (-)

Recommended Management Actions

A variety of mitigation measures have been identified that could mitigate the scale, intensity, duration or significance of the impacts. These measures, which have been informed by various related specialist studies, are included in this Final Basic Assessment Report (FBAR) and in the draft EMPr (attached). The FBAR and draft EMPr also includes guidelines to be applied during the construction and operational phases of the project.

Conclusion

Development, by its very nature, implies impact. The EIA process identifies and quantifies these impacts. Where possible these impacts are avoided through planning revision. In other cases, mitigation is proposed to reduce the severity and significance of the impacts.

The FBAR provides a summary description of the feasible alternatives and potential impacts identified during the BAR Phase; additional information on the affected environment, a description and assessment of the potential impacts associated with the various feasible alternatives as well as an indication of potential mitigation measures; conclusions and various recommendations with regard to the way forward; and a series of Appendices containing relevant information, including the various specialist studies.

The draft EMPr provides much more detailed mitigation measures, and should all proposed mitigation measures be instituted it is not envisaged that the proposed development poses any negative impacts of high significance which cannot be mitigated.

It is the final considered opinion of the Environmental Assessment Practitioner (Henwood Environmental Solutions) that the proposed development (Clearing and cultivation of indigenous vegetation (19.6ha) on the Farm Uguhleni 698 JT) will **not** have a detrimental negative impact on the surrounding environment if all mitigation measures are implemented.

It is therefore the **EAP's recommendation that authorisation be granted provided that good environmental practices be implemented**; and that this will include environmentally sensitive planning and design of all structures.

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SECTION B: BACKGROUND INFORMATION

Table 1: Details of Applicant and EAP

Project applicant:	Denys Snyman		
Trading name (if any):	Barberton Valley Plantations		
Contact person:	Denys Snyman		
Physical address:			
Postal address:	PO Box 1599 Barberton		
Postal code:	1300	Cell:	071 674 3557
Telephone:		Fax:	
E-mail:	DenysS@barbertonvalleyplantations.biz		
Environmental Assessment Practitioner:	Henwood Environmental Solutions (HES)		
Contact person:	Anne-Mari White		
Postal address:	PO Box 12340, Steiltes, Nelspruit		
Postal code:	1213	Cell:	078 672 3645
Telephone:	078 672 3645	Fax:	
E-mail:	shenwood@mweb.co.za		
Qualifications:	<ul style="list-style-type: none"> • Bachelor of Science Degree in Environmental Management University of South Africa (UNISA) • Registered Environmental Assessment Practitioner (EAPASA – 2020/602) • Natural Scientist, South African Council for Scientific Natural Professionals (SACNASP – 300067/15) • Member, International Association for Impact Assessment South Africa (IAIAsa) 		
Professional affiliations (if any):			
Curriculum Vitae	See Appendix F; Annexure D for the EAP's Curriculum Vitae		



SECTION C: DETAILED DESCRIPTION OF THE PROPOSED ACTIVITY

Describe the activity, which is being applied for, in detail. The description must include the size of the proposed activity (or in the case of linear activities, the length) and the size of the area that will be transformed by the activity.

Table 2: Activity Description

Denys Snyman (Barberton Valley Plantations) (the applicant) proposes Clearing and cultivation of indigenous vegetation (19.6ha) on the Farm Uguhleni 698 JT.

The proposed development site is adjacent to existing agricultural fields and therefore no new infrastructure will be developed on site. Although the site is zoned for Agriculture, it is currently undisturbed natural bush.

To this end the following components constitute the project:

Macadamia Farming:

- Macadamia trees will be planted on the suitable soils.
- A total area of 19.6ha is to be cleared and utilized for agriculture (macadamia tree)
- The trees will be farmed according to best practice standards.

See proposed layout for orientation and reference Appendix A.

Table 3: Activity Description as per the project description that relates to the applicable listed activity.

Government Notice R983 Activity No.	Describe the relevant Basic Assessment Activity in writing as per Listing Notice 1 (GN No. R983)	Describe the portion of the development as per the project description that relates to the applicable listed activity
Activity 27	<p><i>“The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</i></p> <p><i>(i) the undertaking of a linear activity;</i></p> <p><i>or</i></p> <p><i>(i) maintenance purposes undertaken in accordance with a maintenance management plan.”</i></p>	<p>The cultivation of macadamias will result in an area of 19.6 ha of indigenous vegetation being cleared.</p>

SECTION D: PROPERTY/SITE DESCRIPTION

Provide a full description of the preferred site alternative (farm name and number, portion number, registration division, erf number etc.):

Table 4: Site Alternative Description

The Farm Uguhleni 698 JT.

T	0	J	T	0	0	0	0	0	0	0	0	0	0	6	9	8	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Indicate the position of the activity using the latitude and longitude of the centre point of the preferred site alternative. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection. The position of alternative sites must be indicated in Section B of this document.

Table 5: Activity Position

Latitude (S):			Longitude (E):		
25°	46'	59.61"	30°	55'	24.70"

In the case of linear activities:

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):		Longitude (E):	
°	'	°	'
°	'	°	'
°	'	°	'

SITE OR ROUTE PLAN (SEE APPRNDIX A)

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as an appendix to this document.

The site or route plans must be at least A3 and must include the following:

- 6.1 a reference no / layout plan no., date, and a legend / land use table
- 6.2 the scale of the plan which must be at least a scale of 1:2000.
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites.
- 6.4 the exact position of each element of the application as well as any other structures on the site.
- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, streetlights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all indigenous trees taller than 1.8 meters and all vegetation of conservation concern (protected, endemic and/or red data species).
- 6.8 servitudes indicating the purpose of the servitude.
- 6.9 sensitive environmental elements within 100 meters of the site or sites including (but not limited thereto):
 - watercourses and wetlands.
 - the 1:100 year flood line.
 - ridges.
 - cultural and historical features.
- 6.10 10 meter contour intervals

SITE PHOTOGRAPHS (SEE APPENDIX B)

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached as an appendix to this form.

FACILITY ILLUSTRATION (SEE APPENDIX C)

A detailed illustration of the activity must be provided at a scale of 1:200 as an appendix for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

SECTION E: BASIC ASSESSMENT REPORT

Prepare a basic assessment report that complies with Regulation 22 of the Environmental Impact Assessment Regulations, 2010. The basic assessment report must be attached to this form and must contain all the information that is necessary for the competent authority to consider the application and to reach a decision contemplated in Regulation 25, and must include:

Table 6: Basic Assessment Content Check List

(Checklist for official use only)

1. Details of the EAP, including curriculum vitae.	✓	
2. The location of the activity, including: i. the 21 digit Surveyor General code of each cadastral land parcel. ii. where available, the physical address and farm name. iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	✓	
3. A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale.	✓	
4. A description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the activities to be undertaken including associated structures and infrastructure	✓	
5. Description of the policy and legislative context within which the development is proposed including- i. an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and ii. how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	✓	
6. A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	✓	
7. A motivation for the preferred site, activity and technology alternative.	✓	

<p>8. A full description of the process followed to reach the proposed preferred alternative within the site, including:</p> <ul style="list-style-type: none"> i. details of all the alternatives considered. ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs. iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them. iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. v. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- <ul style="list-style-type: none"> a. can be reversed. b. may cause irreplaceable loss of resources; and c. can be avoided, managed or mitigated. vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives. vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. viii. the possible mitigation measures that could be applied and level of residual risk. ix. the outcome of the site selection matrix. x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity; 	<p>✓</p>	
<p>9. 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-</p> <ul style="list-style-type: none"> i. a description of all environmental issues and risks that were identified during the environmental impact assessment process; and ii. (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 	<p>✓</p>	

mitigation measures;		
10. an assessment of each identified potentially significant impact and risk, including- <ul style="list-style-type: none"> i. cumulative impacts. ii. the nature, significance and consequences of the impact and risk. iii. the extent and duration of the impact and risk. iv. the probability of the impact and risk occurring. v. the degree to which the impact and risk can be reversed. vi. the degree to which the impact and risk may cause irreplaceable loss of resources; and vii. the degree to which the impact and risk can be avoided, managed or mitigated; 	✓	
11. Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	✓	
12. An environmental impact statement which contains- <ul style="list-style-type: none"> i. a summary of the key findings of the environmental impact assessment. ii. a map at an appropriate scale which superimposes the proposed activity and its associated iii. structures and infrastructure on the environmental sensitivities of the preferred site iv. indicating any areas that should be avoided, including buffers; and v. a summary of the positive and negative impacts and risks of the proposed activity and vi. identified alternatives; 	✓	
13. Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	✓	
14. Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	✓	
15. A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed.	✓	
16. A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be	✓	

authorised, any conditions that should be made in respect of that authorisation;		
17. Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	✓	
18. An undertaking under oath or affirmation by the EAP in relation to the correctness of the information provided in the reports. <ul style="list-style-type: none"> i. the inclusion of comments and inputs from stakeholders and I&AP's. ii. the inclusion of inputs and recommendations from the specialist reports where relevant; and iii. any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts; 	✓	
19. Any specific information that may be required by the competent authority; and	None	
20. Any other matters required in terms of section 24(4)(a) and (b) of the Act.	None	

The basic assessment report must take into account -

- (a) any relevant guidelines; and
- (b) any departmental policies, environmental management instruments and other decision making instruments that have been developed or adopted by the competent authority in respect of the kind of activity which is the subject of the application.

*In terms of Regulation 22(4), the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub regulation 22(2)(h), exist.

Table 7: Indication of evaluation of alternatives

Have reasonable and feasible alternatives been identified, described and assessed?	YES ✓	
If NO, the motivation and investigation required in terms of Regulation 22(4) must be attached as an Appendix to this document		

1 Description of the Affected Environment by the Proposed Activity

The proposed site falls within the Legogote Sour Bushveld Veldtype, as defined in the Vegetation of Southern Africa, Lesotho and Swaziland, (Ladislav Mucina and Michael C. Rutherford 2006). Legogote Sour Bushveld is classified as an endangered vegetation type. More recently, Legogote Sour Bushveld has been listed as a Threatened Ecosystem and classified as Vulnerable.

Typical Legogote Sour Bushveld is characterised by open to dense woodland on gently to moderately undulating terrain with high density of trees and shrubs.

1.1 Locality and physical geography

The proposed agricultural development is situated the farm Uguhleni 698 JT, approximately 15 km west of Barberton in the Ehlanzeni District, Mpumalanga Province, South Africa (Figure 1). Most of the area to the north, east and south of the site is agriculturalised, with some remaining natural vegetation occurring to the west of the site. The perennial Queens River lies 100 m from the southern boundary at its closest point. The large Selapi Village is situated immediately to the south of the study area.

The property is situated within the quarter-degree grid square (QDGS) 2530 DD.

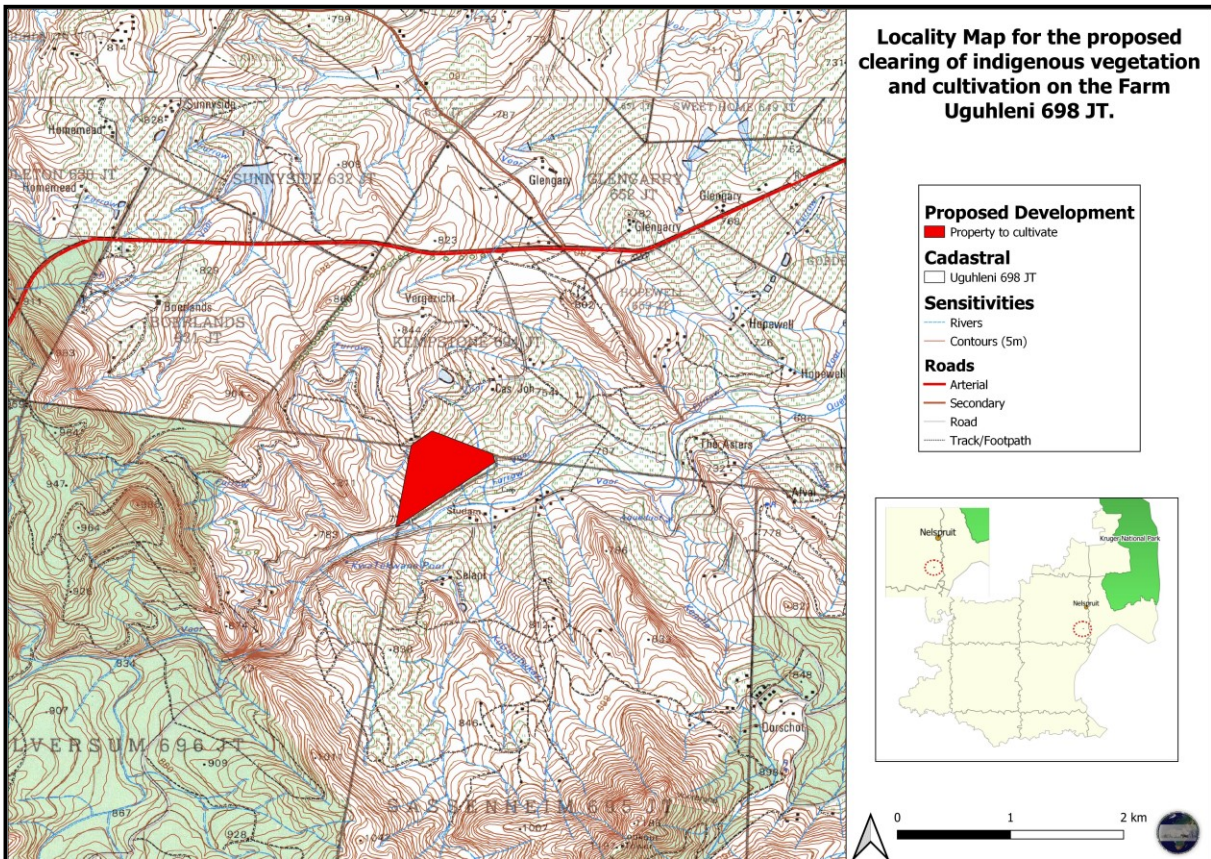


Figure 1: Locality

1.2 Geology and soils

Soils within the Study Area are classified as **Chromic Cambisols** according to the World Reference Base (Jones *et al.* 2013). Chromic Cambisols are described as “*moderately developed soil with a redish hue*” (Jones *et al.* 2012). Soils in the Study Area are considered to have a moderate risk of erosion (Schulze and Horan 2006)

Soil samples taken from the site indicate that:

- All 4 of these samples were measured in the ideal range of between 4.5 and 5.5. This is ideal for macadamia cultivation as macadamias are very sensitive to soils with a pH higher than 5.5
- All 4 samples tested on a very low level for Phosphate, but when it comes to Macadamia farming, this is much more ideal than a Phosphate level that is too high. It is much easier to pick up the level of Phosphate in the soil to where it should be, rather than to try and decrease the level of Phosphate in the soil.
- All 4 of the samples were exactly in the norm for Macadamia farming or very close to the norm. The Calcium is very important when it comes to soil quality and nut quality. T
- The 4 samples that were taken is a little bit higher in the Magnesium Percentage than what we would want it to be, but this is a common occurrence of virgin soils. The reason for the magnesium being a little bit to high is because the Potassium levels are on the lower side compared to what it should be.
- As above, the Potassium levels are lower than what we would want it to be. This is very easily fixed. By applying Potassium to the trees after they have been planted, the lack of Potassium in the soil will start to decrease and the Magnesium levels will then decline and fall into the ideal levels for Magnesium.
- Like mentioned above, the Potassium levels are lower than what we would want it to be. This is very easily fixed. By applying Potassium to the trees after they have been planted, the lack of Potassium in the soil will start to decrease and the Magnesium levels will then decline and fall into the ideal levels for Magnesium

1.3 Topography

The proposed development straddles Quaternary Catchments X23E and X23F, in the middle reaches of the Queens River Catchment, Nkomati Water Management Area. The proposed development area slopes in a south-eastern direction towards the Queens River at an average gradient of ~0.100, which is classified as Strongly Sloping. However, slope analysis carried out in detail on individual proposed fields indicates that the average slope is 6.6% slope.

Figures 2 and 3 below show the specific topography and Figures 4a-d the degree of slope, of the proposed development site.

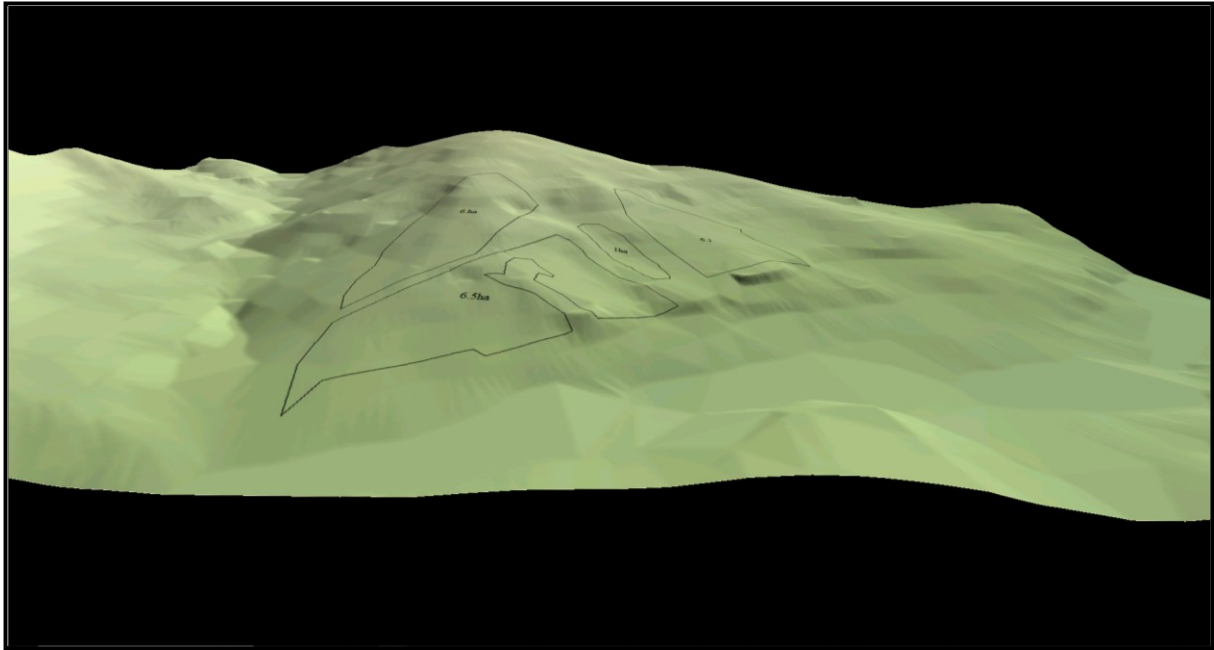


Figure 2: 3D model of the site.

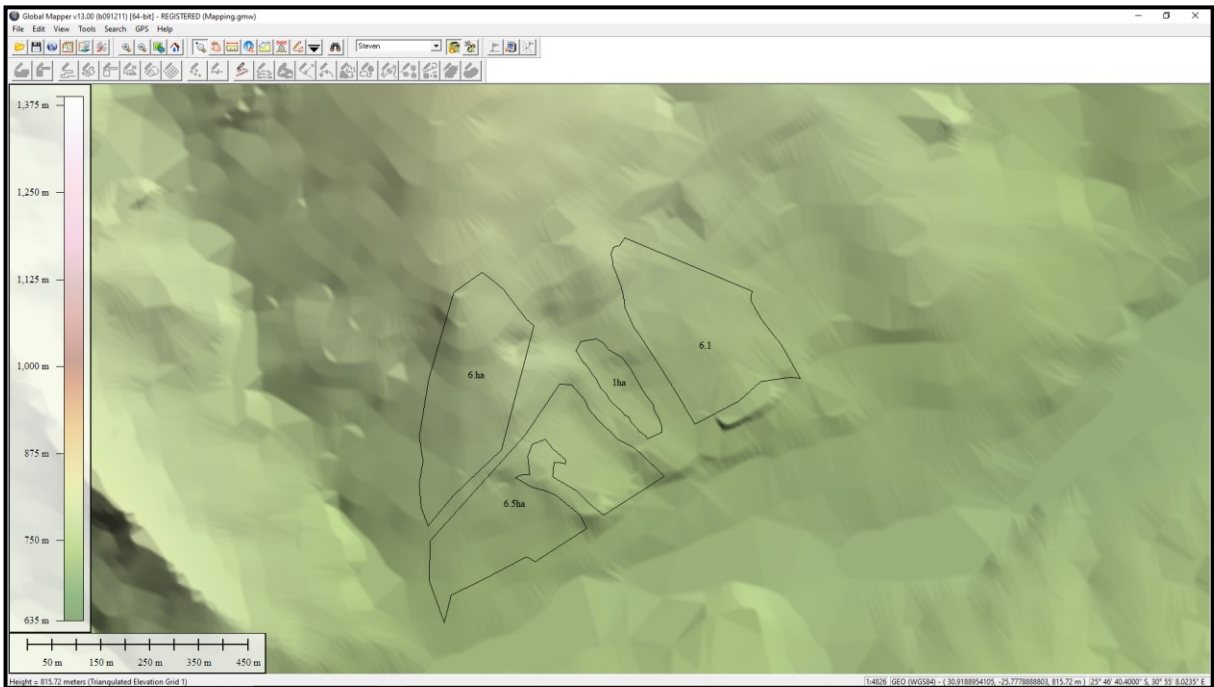


Figure 3: Topography of the site and surrounding area

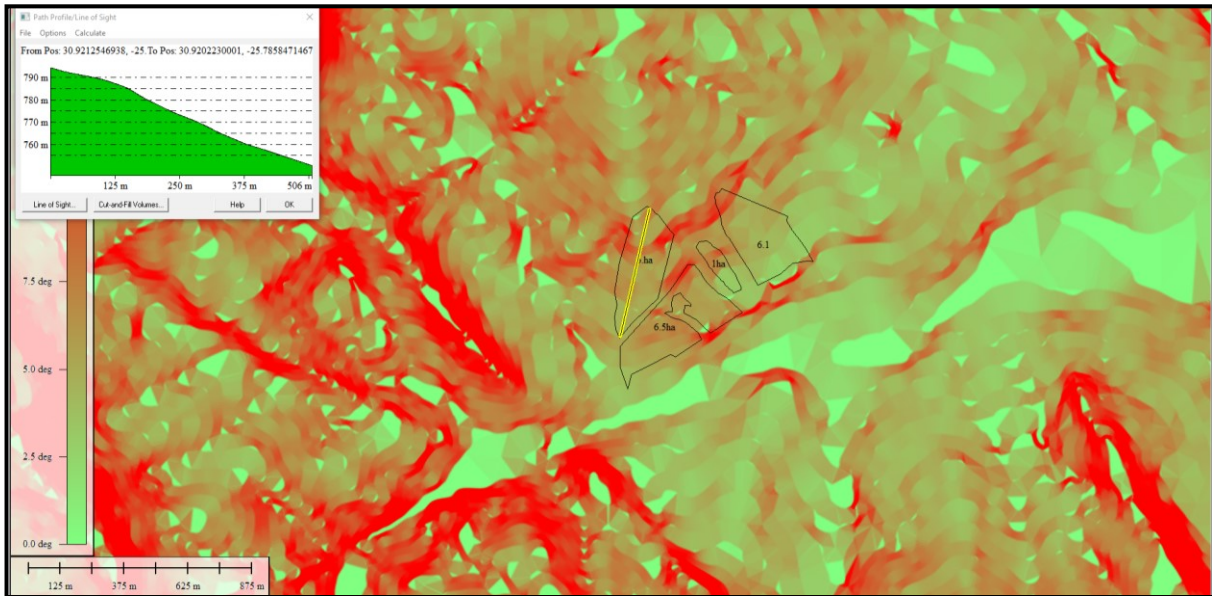


Figure 4a: 7.8% average slope

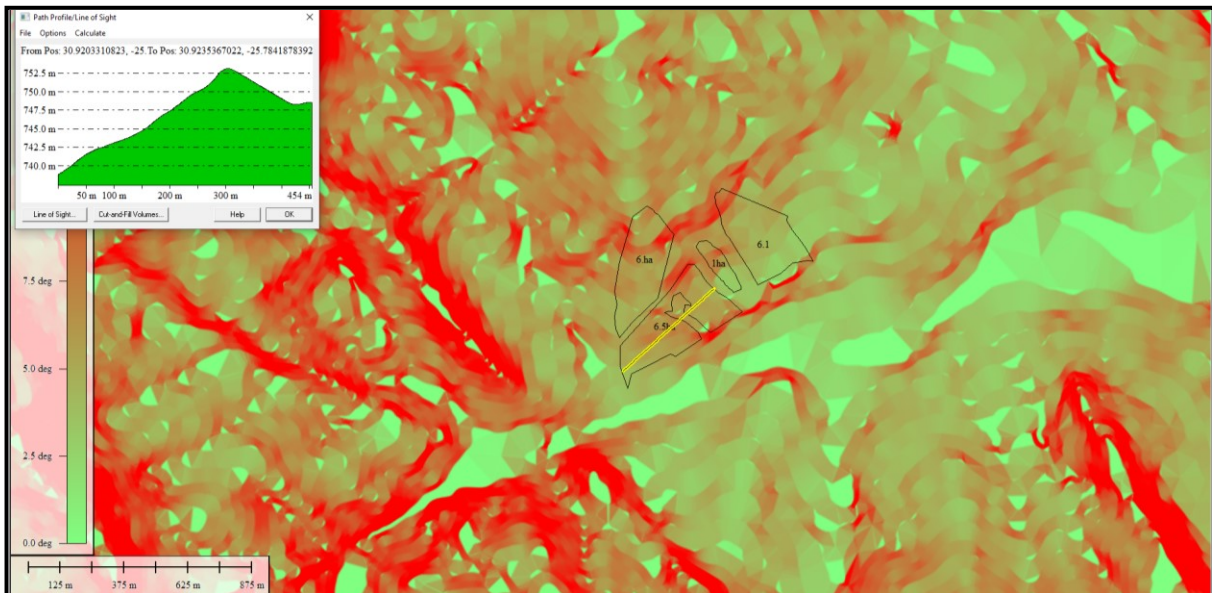


Figure 4b: 2.7% average slope

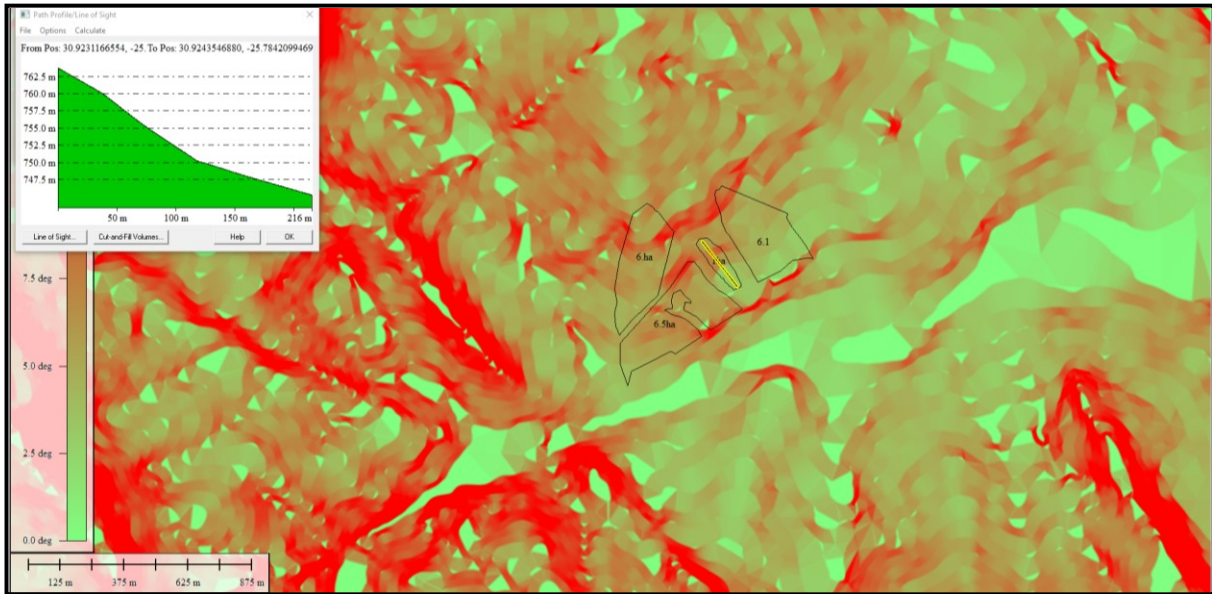


Figure 4c: 9.2 average slope

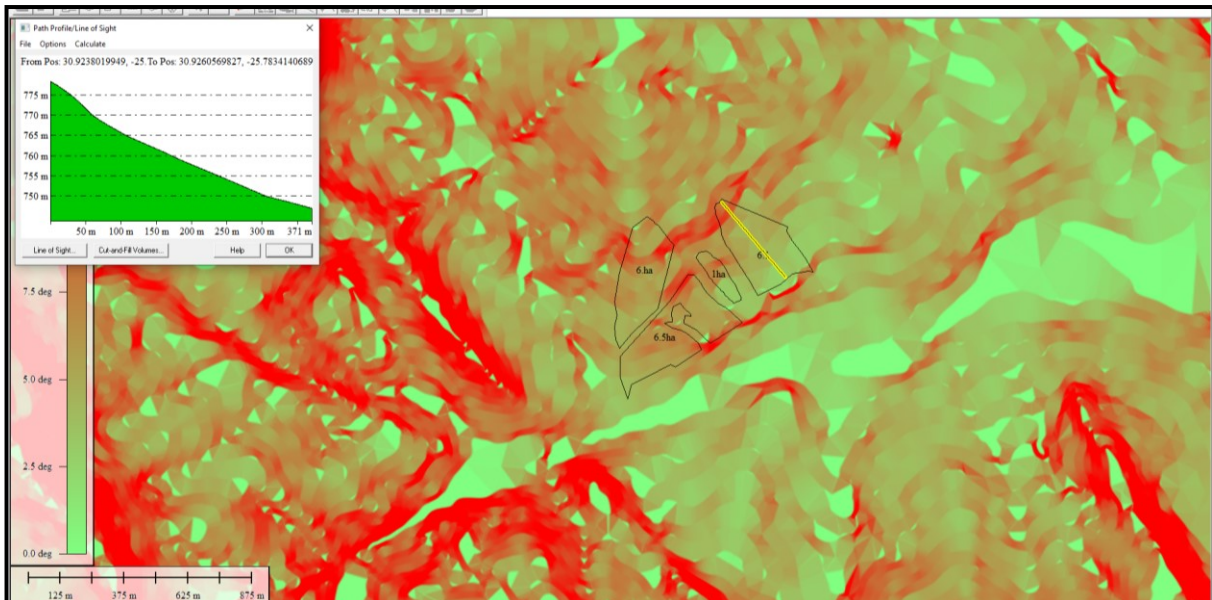


Figure 4d: 6.7% average slope

Figure 4a - d: The degree of slope of the site. Note that the study area displays a moderate gradient of about 6.6%.

1.4 Climate

Summer rainfall and dry winters occur, with MAP from 652mm (Schulze and Lynch, 2006), and 813 to 844mm (Hijmans et al. 2005). Mean monthly maximum and minimum temperatures 35.7° and 1.6° for October and July (Nelspruit), respectively.

1.5 Biological aspects

1.5.1 Terrestrial Ecology

Regional Context

Five vegetation communities are represented within the study area, based on distinctive vegetation structure (grassland, woodland, thicket, etc.), floristic composition (dominant and diagnostic species) and position in the landscape (mid-slopes, terrace, crest, etc.). Alien plant species are indicated by an asterisk.

1. *Dichrostachys cinerea* – *Sporobolus pyramidalis* Secondary Woodland

This community makes up the largest extent of the study area and varies in species composition, abundance and vegetation structure (Figure 3), largely due to varying intensities and frequencies of modification for agricultural practices over time.

Vegetation structure varies but can mostly be characterised as Low Bushland to Low Thicket (Edwards 1983), which is dominated by herbs and shrubs (1 – 5 m), many of which are aliens or pioneer/ subclimax species. Emergent trees (2 – 5 m) are scattered throughout.

Dominant indigenous tree species include *Dichrostachys cinerea* subsp. *nyassana*; while *Cussonia spicata*, *Vachellia karroo*, *V. sieberiana*, *Dombeya rotundifolia*, *Searsia pentheri*, *Annona senegalensis*, *Senegalia caffra*, *Antidesma venosum*, *Hippobromus pauciflorus* and *Ziziphus mucronata* occur frequently. Alien trees are represented by * *Jacaranda mimosifolia*, * *Melia azedarach* and * *Pinus* spp.

The shrub layer is dominated by *Pseudarthria hookeri*, * *Psidium guajava*, * *Lantana rugosa*, * *Bidens pilosa* and *Lippia javanica*, while *Gymnanthemum crataegifolium* occurs frequently. *Sporobolus pyramidalis* is the dominant grass species. Other common species include *Hyparrhenia hirta*, *Aristida congesta* subsp. *barbicollis*, *Eragrostis curvula*, *Heteropogon contortus*, *Hyperthelia dissoluta*, *Melinis repens* and *Themeda triandra*.

A total of 117 species (60% of the entire list) was recorded from the Secondary Woodland community, the highest species richness of the five vegetation communities in the study area

2. *Bridelia micrantha* – *Syzygium cordatum* Riparian Forest

This community can be classified as Short to Tall Forest (Edwards 1983, and occurs at the northern extent of the central drainage line. Trees that dominate the upper canopy include *Syzygium cordatum* and *Bridelia micrantha*; while frequently occurring species include *Celtis africana*, *Ficus sur* and *Syzygium guineense*. Additional woody species in the canopy include * *Coffea arabica*, *Tricalysia capensis* and *Dalbergia armata*. Common understory forbs include *Thelypteris dentata*, *Carex spicato-paniculata*, *Oplismenus hirtellus* and *Pteris catoptera*. A total of 54 species (28% of the entire list) was recorded from the Riparian Forest community, the second lowest species richness of the five vegetation communities in the study area

3. *Jacaranda mimosifolia* – *Hippobromus pauciflorus* Riparian Thicket

This community can be classified as Short Thicket (Edwards 1983, and occurs along the drainage lines, which slope in a southerly direction towards the Queen's River. It has been historically heavily disturbed by agricultural activities. This community is dominated by the tree * *Jacaranda mimosifolia*, while the indigenous tree *Hippobromus pauciflorus* dominates the understory. Other frequently occurring alien trees include * *Melia azedarach*, * *Morus alba* and * *Pinus* sp. Frequently occurring indigenous trees include *Gymnosporia senegalensis* and *Euclea crispa*, while less common trees include *Celtis africana*, *Combretum zeyheri*, *Volkameria glabra*, *Ficus petersii*, *F. sycamorus* and *Syzygium cordatum*. Frequently occurring indigenous shrubs include *Diospyros whyteana* and *Flueggea virosa*, while the alien species * *Solanum mauritianum* and * *Lantana camara* occur frequently. The vigorous herbaceous layer is dominated by the alien herbs * *Bidens pilosa* and * *Desmodium uncinatum*, while the dominant grass species is *Setaria megaphylla*.

A total of 43 species (22% of the entire list) was recorded from Riparian Thicket, the lowest species richness for the five vegetation communities present within the study area.

4. *Dombeya rotundifolia* – *Jacaranda mimosifolia* Short Thicket

This vegetation community contains of an abundance of shrubs (2 – 5 m) and trees (3 – 10 m) and exists along bands where previous earth-moving works for agricultural practices occurred.

Frequently occurring trees include a mix of indigenous and alien species from the surrounding landscape i.e., *Searsia pentheri*, *Cussonia spicata*, * *Jacaranda mimosifolia*, *Dichrostachys cinerea* subsp. *nyassana*, *Vachellia karroo*, *V. sieberiana*, *Dombeya rotundifolia* and *Hippobromus pauciflorus*. Frequently occurring shrubs include *Pseudarthria hookeri*, *Euclea crispa* and * *Psidium guajava*, while frequently occurring herbaceous species include * *Tagetes minuta* and * *Desmodium uncinatum*. The most regularly occurring grass species are *Hyparrhenia hirta*, *Sporobolus pyramidalis* and *Themeda triandra*.

A total of 56 species (29% of the entire list) was recorded from Short Thicket, the third highest species richness of the five vegetation communities present within the study area

5. *Phragmites mauritianus* Wetland

The Wetland community occurs in the extreme south-western portion of the study. Vegetation structure is Tall Grassland (Edwards, 1983. The instream and channel edge dominated by the reed *Phragmites mauritianus*, while frequently occurring sedges include *Thelypteris interrupta*, *Cyperus esculentus*, *Fimbristylis dichotoma* and *Schoenoplectus corymbosus*. The herbs *Persicaria decipiens* and * *Ranunculus multifidus* occur throughout. The alien shrub * *Lantana camara* occurs frequently along wetland edge. Obligate wetland grasses include * *Cynodon nlemfuensis*, *Bothriochloa bladhii*, *Leersia hexandra*, * *Paspalum dilatatum*, *P. distichum* and * *P. urvillei*.

A total of 78 species (40% of the entire list) was recorded from Wetland, the second highest species richness for the five vegetation communities present within the study area

Site-specific Ecological Importance Analysis

An Ecological Importance analysis of the five vegetation communities represented in the study area was undertaken using the methodology described in Section 4.4. Table 11 shows the calculation of Ecological Importance of the study area, which is displayed in Figure 7 below.

- The **Secondary Woodland** community has Low Conservation Importance (CI) as only a few protected plants were confirmed, and disturbance levels are very high. Few potentially occurring SCC are possible. This leads to a Functional Integrity (FI) assessment of Low and a Biodiversity Importance (BI) of Low. Receptor Resilience (RR) is Medium as Legogote Sour Bushveld is a vegetation type that is slow to recover fully after disturbances or impacts and contains species that only have a moderate likelihood of returning to a site once the disturbance or impact has been removed. The integration of Low BI and Medium RR results in a SEI of **Low**.
- The **Riparian Forest** has a High CI due to the confirmed presence of nationally and provincially protected plants, due to the national protection status of riparian areas, due to the confirmed presence of a NT-listed mammal and due to potentially having a local importance as an ecological corridor. FI is only Medium due to the presence of several alien invasive plant species. This leads to a BI value of Medium. RR is Low as riparian areas contain habitat that is unlikely to be able to recover fully after a relatively long period. When the Medium BI is combined with a Low RR the resulting SEI is **High**.
- The **Riparian Thicket** has a High CI due to the confirmed presence of nationally and provincially protected plants, due to the national protection status of riparian areas and due to potentially having a local importance as an ecological corridor. Functional Integrity (FI) is Low due to the dominance of many alien invasive plant species and high disturbance levels. This leads to a BI value of Medium. Receptor Resilience (RR) is Medium as degraded riparian areas contain habitat that is slow to recover fully after disturbances or impacts and contain species that only have a moderate likelihood of returning to a site once the disturbance or impact has been removed. When the Medium BI is combined with a Medium RR the resulting SEI is **Medium**.
- The **Short Thicket** community has Medium CI as only a few protected plants were confirmed, and disturbance levels are very high. No potentially occurring SCC are possible. This leads to a FI assessment of Low and a BI of Low. RR is Medium as Legogote Sour Bushveld is a vegetation type that is slow to recover fully after disturbances or impacts and contains species that only have a moderate likelihood of returning to a site once the disturbance or impact has been removed. The integration of Low BI and Medium RR results in a SEI of **Low**.
- The **Wetland vegetation** community has a High CI due to the national protection status of wetlands, due to being intact and therefore performing important wetland functions such as water attenuation, water storage and filtering and due to potentially having a local importance as an ecological corridor. FI is High. This leads to a BI value of High. RR is Medium as wetland areas contain habitat that is slow to recover fully after disturbances or impacts and contain species that only have a moderate likelihood of returning to a site once

the disturbance or impact has been removed. When the High BI is combined with a Medium RR the resulting SEI is **High**.

Table 8: Ecological Sensitivity of Vegetation Communities in the Study Area

Assessment Criteria	Secondary Woodland	Riparian Forest	Riparian Thicket	Short Thicket	Wetland
Conservation Importance	Medium	High	High	Medium	High
Functional Integrity	Low	Medium	Low	Low	High
Biodiversity Importance	Low	Medium	Medium	Low	High
Receptor Resilience	Medium	Low	Medium	Medium	Medium
SITE ECOLOGICAL IMPORTANCE	Low	High	Medium	Low	High



Figure 5: Site-specific Ecological Importance.

The following preliminary recommendations and mitigation measures for the proposed development are applicable:

- It is suggested that all new agricultural developments be restricted to the areas formerly cultivated and that a 30 m conservation buffer be implemented around the edge of all riparian areas and drainage lines.
- The placing of all proposed agricultural lands within the Secondary Woodland and exclusion of all other vegetation communities from development will reduce the overall impact to Low.
- An independent Environmental Compliance Officer must be appointed to monitor compliance with the RoD during all phases of construction; and
- Bulk clearing of vegetation should be restricted to the dry months between April and September to reduce erosion and subsequent sedimentation.
- Avoid the destruction of all protected plants, wherever possible. • If plants are located within the area to be cleared, then a destruction permit from the relevant authority should be applied for.
- In order to comply with the National Environmental Management: Biodiversity Act (Act No. 10 OF 2004), all listed invasive exotic plants as indicated in Appendix 1 of the ecology report should be targeted and controlled.
- An alien plant control plan should be compiled to address the inevitable invasion that will follow the resultant bare soil after construction work. Once clearing commences, regular monitoring of the study area and adjacent natural habitat should take place to ensure that no woody alien species are establishing. If located, all plants should be destroyed. This is not applicable to annual “weeds” which are significantly harder to control and will also assist with the binding of loose soil within the construction site.
- It is important that weed control, if involving herbicides, be managed correctly to reduce the impact on the adjacent natural vegetation.
- Regular inspections should be made to determine if any additional alien plants have established.
- It is recommended that clearing be conducted in the dry months between April and September, prior to the onset of the rains. The seasonal arrival of the rain season subsequent to construction will then allow for the natural re-vegetation of bare areas, from the seedbank within the soil. Suitable drains and other stormwater infrastructure should be constructed in areas where run-off is likely. Application of these measure are likely to reduce the impact significance to Low, which would require no further application of the Mitigation Hierarchy.
- Due to the area surrounding the proposed development site appearing to be accessible to the general public, no appropriate mitigation measures can be made. The erection of a boundary fence and implementation of strict access controls may reduce the impact rating to Low, which would require no further application of the Mitigation Hierarchy.

Provided the recommendations suggested in this report are followed, and the developer complies with all relevant legislation pertaining to the development activities (such as the NEMBA and the NEMPAA), there is no objection to the proposed developments in terms of the terrestrial ecosystems of the study area. However, if the development was to proceed without the implementation of the recommendations given above then we would object to the development application.

1.5.2 Wetland Ecology

The proposed development is ~15 km west of Barberton, within the Mjindi Local Municipality, Ehlanzeni District, Mpumalanga Province (Figure 2-1). The Study Area for this report considered all aquatic ecosystems within 500 m of the proposed development, as required in terms of Government Notice 509 (26th August 2016). The Study Area for this report covered an area of ~240 hectares.

Five hydro-geomorphic aquatic ecosystem type was identified within the study area as follows:

1. Mountain Headwater” Drainage Lines
2. Mountain Stream” Drainage Line
3. Upper Foothills
4. Unchannelled Valley Bottom Wetland
5. Seepage Wetland

“Mountain Headwater” Drainage Lines

There were no aquatic habitats in “Mountain Headwater” Drainage Lines as flows were too ephemeral to support obligate aquatic species.

Upper Foothills

Instream habitats in the Queens River comprised pools, including artificial pools created by weirs, interspersed by rapids. The channel was bordered by dense stands of Phragmites reeds. Riparian habitats were largely degraded, but there were scattered trees remaining in what is likely to have been a former riparian forest.

Unchannelled Valley Bottom Wetland

Aquatic habitats in the Unchannelled Valley Bottom Wetland comprised seasonally inundated shallow wetland on permanently saturated clays with a moderate diversity of wetland plants, comprising mostly reeds, grasses and sedges.

Seepage Wetland

Aquatic habitats in the Seepage Wetland comprised what appeared to be permanent shallow pools and seepage zones. The vegetation comprised large trees with a high diversity of obligate wetland plants.

Details of the classification are presented in Appendix C. The proposed development area also supported episodic drainage lines. The drainage lines are important for stormwater management but did not support riparian vegetation and are therefore not classified as aquatic ecosystems. The drainage lines were mapped for this report based on GPS readings taken during the field survey, but they were not considered in further detail in this report. The Study Area also supported an Unchannelled Valley Bottom Wetland and an Earth Dam (Figure 7). These areas will not be affected by the proposed development, so they were mapped based on desktop aerial imagery, and not considered further for the purposes of this report.

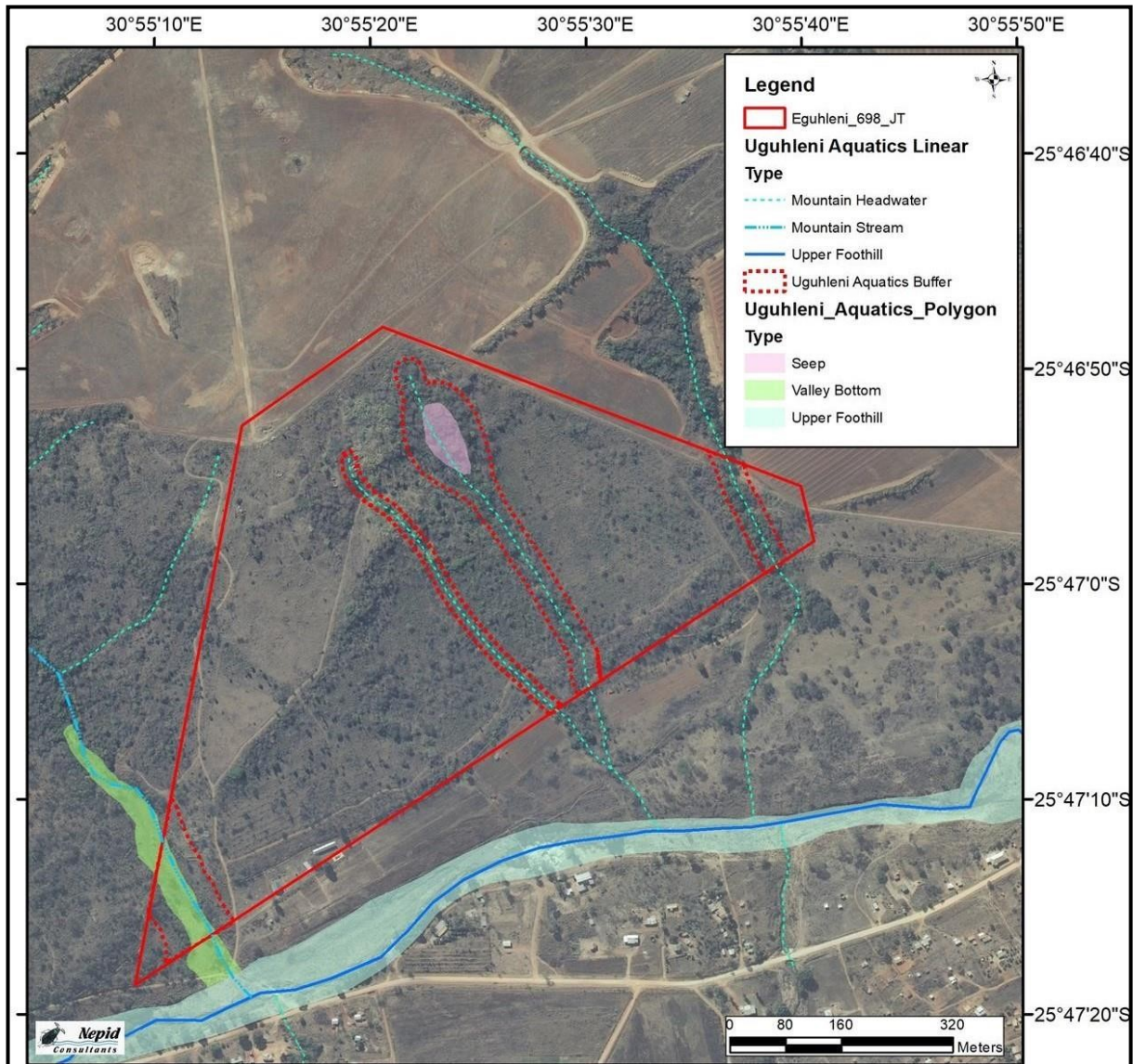


Figure 6: Delineation of Aquatic Ecosystems within the Study Area.

Recommendations

Authorisation

Authorisation of the proposed development in relation to potential impacts on aquatic ecosystems is recommended on the grounds that the Ecological Importance and Sensitivity of aquatic ecosystems potentially impacted is **Low**, and because the risks to aquatic ecosystems are Low and can be avoided or minimised by adhering to the recommended control measures as detailed in Appendix I of the aquatic assessment.

- **Aquatic Buffer Zones.** Aquatic buffer zones of no development apart from access roads that cross drainage lines are recommended. Access roads must be routed to minimise crossings of drainage lines. The following aquatic buffer zones are recommended (Figure 6):
 - **15 m** on either side of all episodic “Mountain Headwater” Drainage Lines. The aim of this buffer zone is to minimise the risks of erosion.
 - **30 m** from the outer edge of the Unchanneled Valley Bottom Wetland and Seepage Wetland (forest patch). The aim of the buffer zone is to maintain the ecological

integrity and functioning of these wetlands by avoiding direct impacts and minimizing indirect impacts that could be associated with the proposed development. A buffer zone of 30 m is recommended for these wetlands because:

- the slope of the surrounding topography is steep and sufficient to generate significant surface runoff during storm events, so a wide buffer zone around these areas is appropriate;
 - the Seepage Wetland constitutes what appears to be a permanent spring, and as such, a wide buffer zone is appropriate;
 - both of these wetlands remain functionally intact and provide important ecological goods and services, including biodiversity support, grazing for cattle, and nutrient assimilation, so a wide buffer is appropriate so as to protect these services; and
 - vegetation cover in and around the wetlands is generally sparse, and this is likely to be more so after fire, so a wide buffer zone is appropriate.
- **Stormwater Management Plan.** A Stormwater Management Plan must be developed for the proposed development and the associated access roads. The design of the stormwater system must aim to reduce risks of sediment transport and water quality deterioration by:
 - stormwater runoff must be managed to avoid elevated peak flows from impacting on watercourses. High water velocity greatly increases the erosion risk so drains that convey such water should contain energy brakes, such as lining with stones, concrete, grass or gabions to reduce the water velocity and therefore erosion;
 - use of multiple smaller discharges rather than a few large discharges;
 - appropriate diversion of stormwater runoff from existing and proposed access to avoid siltation of watercourses; and
 - retention ponds, where appropriate, to reduce the magnitude of stormwater flows;
 - **Control Alien Invasive Vegetation.** Declared alien invasive vegetation within all areas disturbed by site preparation and construction should be controlled at the end of construction, and at annual intervals during operation. Personnel tasked to control alien vegetation should receive appropriate training in the following: methods and control measures; equipment and techniques; types of herbicides and dosages applied; mixing techniques; storage of chemicals and equipment; health and safety issues; plant identification; procedures for equipment washing; equipment maintenance; record keeping, *inter alia*.

Monitoring

Monitoring of aquatic ecosystems is not considered necessary because the low potential impacts that the proposed development is expected to have if the recommended mitigation measures are adhered to.

1.6 Social and economic aspects

The land on which the proposed agriculture, is to take place, is owned by the applicant and is currently classified as agricultural land. Sustainable farming on this property appears to be achievable.

1.6.1 Economic

- **Economy of the local and greater area**

Sustainable development ensures that we meet our present needs without compromising our ability to meet future needs. Considerations of sustainability become increasingly important as global climate change poses new challenges for the future of humanity and social issues become more relevant to the growing world population. As a significant regional player in the agricultural sector, Barberton Valley Plantations focuses on optimising the social and environmental impact of its operations, without compromising economic viability. It is the group's goal to position itself as employer and partner of choice for employees, communities, business initiatives and governments.

The proposed project encompasses all of the above and should be seen as having the potential to strengthen the local area economically.

- **The Rural Economy**

As a large employer, Barberton Valley Plantations plays an increasingly significant economic role in the broader Mbombela area. As a farming company, they proactively support the socio-economic upliftment of the community residents of the areas in which we operate.

This project will play a key role in affording the local community the chance to grow and develop in a positive social and economic way.

- **Local Employment**

The group provides permanent employment for a large number of people. Employees are generally sourced from communities in close proximity to the farming operations and the wages and benefits earned support many more people than those directly employed.

1.6.2 Social (Historical and Paleontological)

- **Historical and Cultural**

An Archaeological and Heritage Impact Assessment was undertaken by Kudzala Antiquity CC in respect of proposed agricultural development on an area of approximately 39,5 hectares on the farm Uguhleni 689 JT located near the town of Barberton in Mpumalanga Province. The study was done with the aim of identifying sites which are of heritage significance on the identified project areas and assess their current preservation condition, significance and possible impact of the proposed action. This forms part of legislative requirements as appears in section 38 of the National Heritage Resources Act (Act No. 25 of 1999). This report can be submitted in support of the National Environmental Management Act (Act 25 of 1998). The survey was conducted on foot and with the aid of a motor vehicle in an effort to locate archaeological remains and historic sites, structures and features. Archival information obtained from the National Archives in Pretoria, including scrutiny of previous heritage surveys of the area formed the baseline information against which the survey was conducted. Two sites, UG 1 and UG 2, were recorded during the physical survey but they are of low heritage significance and no mitigation is needed. They consist of a concrete irrigation dam and the ruined remains of a farmstead. A total of nine survey orientation locations were documented (SO 1-9) which includes a GPS location and photographs of the landscape at that particular location.

- In terms of section 34 of the National Heritage Resources Act (NHRA, 25 of 1999), no significant buildings or structures were located

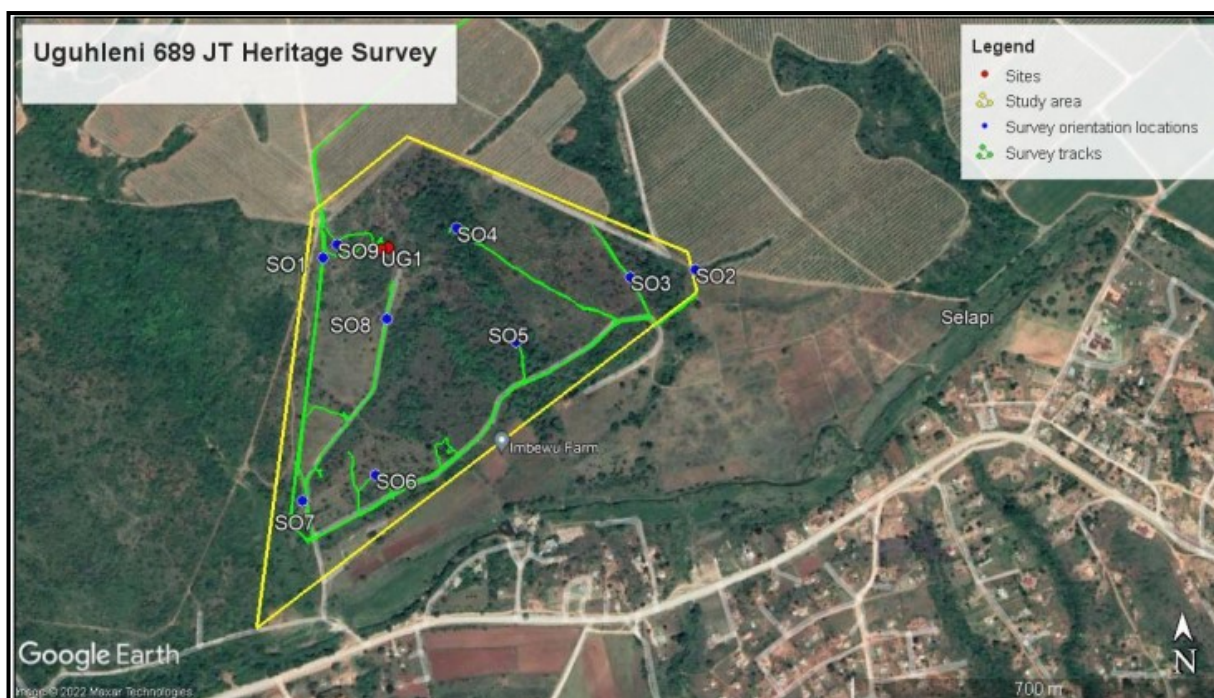


Figure 7: Aerial map of the HIA

- In terms of section 35 of the NHRA, no archaeological sites were located. In terms of section 36 of the NHRA, no graves or gravesites and burial grounds were located. Due to the study area being densely overgrown with vegetation it is possible that some unmarked graves may have been overlooked during the survey. It is also possible that graves may occur nearby residential ruins (sites UG 1 and UG 2) but were not located during the physical survey due to the exceptionally dense vegetation cover. Bush clearing at sites UG 1 and UG 2 should be done with care in the event that unmarked graves may be present. When earth-moving activities are planned here it is recommended that the EMP or a qualified archaeologist be present to monitor the proceedings in the event that graves are encountered. When graves are encountered a qualified archaeologist should be contacted in order to assess and recommend further action.

Recommended management measures Although the surveyor physically surveyed the area as thoroughly as possible, it is incumbent upon the developer to follow a chance find protocol in the instance when cultural remains be unearthed or laid bare during the process of development, as this study does not claim to have recorded every site on the landscape. The contractors and workers should be notified that archaeological sites might be exposed during the construction work.

- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999).

- **Palaeontological**

The farm lies on ancient, igneous rocks of the Kaap Valley Granite (hornblendebiotite granite) and undifferentiated granite that are too old of the incorrect type to preserve any fossils at all (Fig. 2). This is confirmed by the grey colouration in the SAHRIS palaeosensitivity map (Fig. 3). Since there is no chance of any fossils occurring in the area to be cleared or environs, we request exemption from any further palaeontological studies, as far as the palaeontology is concerned, that the project may be authorised.

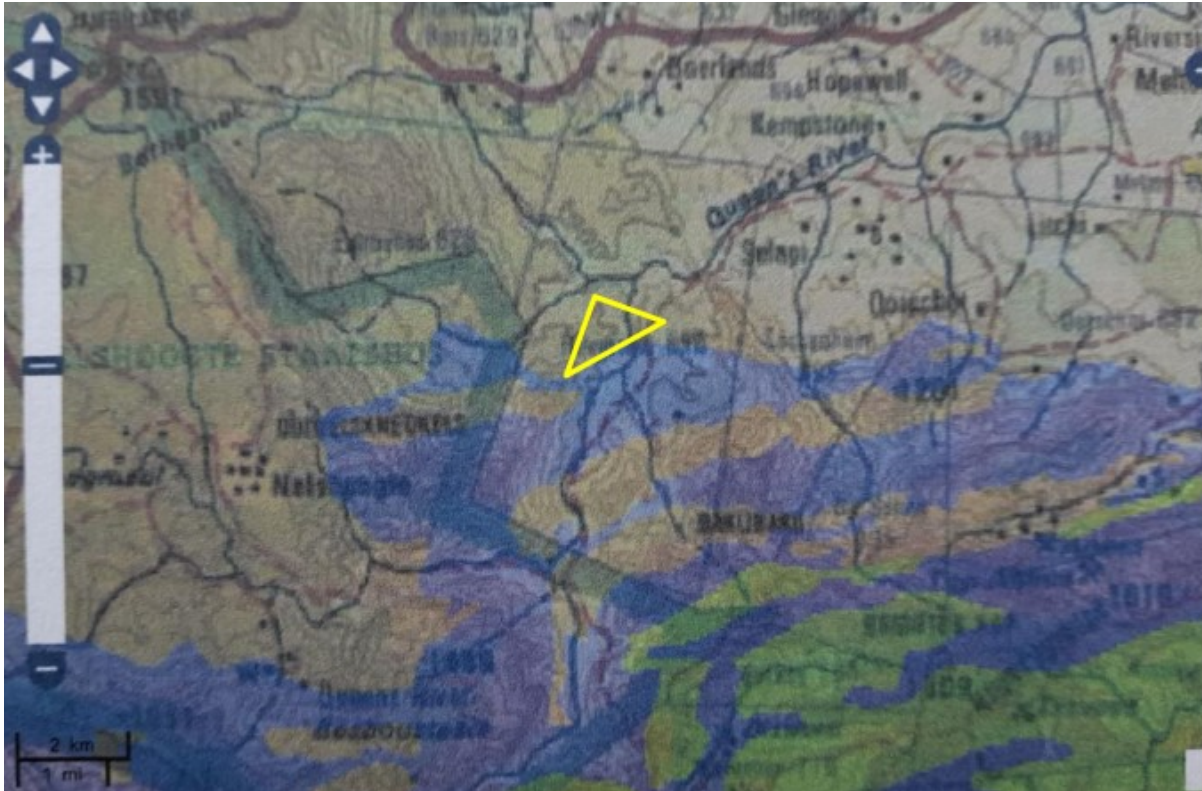


Figure 8: SAHRIS palaeosensitivity map for the site for the proposed Uguhleni 698 JT clearing for agriculture shown within the yellow triangle. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

2 Detailed description of the proposed development.

2.1 Water supply

Water will be supplied to the site via extraction within the ambit of existing water rights. In this regard 22 hectares may be irrigated. See and except from the Water certificate inserted below.

Table 9: Water balance

BESKRYWING VAN EIENDOM	GROTE VAN EIENDOM	INLYSTING
Uguhleni JT 698	35,2177 hektaar	22ha x 6600m ³ = 145 200m ³
TOTALE INLYSTING		22ha x 6600m ³ = 145 200m ³

★★Please find attached (Appendix F; Annexure E) the confirmation of water rights★★

2.2 Electrical supply

Electricity will be supplied to the site via an existing powerline and transformer.

Sanitation and Waste

The development of macadamia trees will be an extension of existing agricultural activities in the area and would require no development of sanitation or waste facilities.

2.3 Access

Access to the site will be via an existing road. See layout and locality maps in this regard.

2.4 Storm water

It is not anticipated that runoff will increase from current site activities.

3 Prescribed Environmental Management Standards, Practices, Policies, Guidelines or Legislation

The following legislation, guidelines, departmental policies, environmental management instruments and/or other decision making instruments that have been developed or adopted by a competent authority in respect of activities associated with a development of this nature, were identified and considered in the preparation of this basic assessment report:

1. City of Mbombela IDP;
2. Amended EIA Regulations, 2014 published in Government Notice No. R. 324, R. 325, R. 327 and R. 328 in Government Gazette No. 40772 dated 07 April 2017;
3. Conservation of Agricultural Resources Act, 1993 (No 43 of 1983) and the regulations dealing with declared weeds and invader plants;
4. Constitution of the Republic of South Africa Act, 1996 (No. 108 of 1996), including section 24;
5. DAFF (1990) Agricultural Product Standards Act, 1990 (No Act 119 of 1990)
6. DEA (2010), Guideline on Need and Desirability, Integrated Management Guideline Series 9, Department of Environmental Affairs (DEA), Pretoria, South Africa.
7. DEA (2010), Public Participation 2010, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs, Pretoria, South Africa;
8. DEA (2011), National list of ecosystems that are threatened and in need of protection. GN 1002, GG 34809, 9 December 2011.
9. DEA&DP (2010), Guideline on Alternatives, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP);
10. DEAT (2002), Specialist Studies, Information Series 4, Department of Environmental Affairs and Tourism (DEAT), Pretoria; National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA").
11. Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
12. Ehlanzeni District Municipality IDP (Final) 2016/17;
13. Hazardous Substances Act, 1973 (Act No. 15 of 1973);
14. Mpumalanga Biodiversity Sector Plan (2014);

15. National Environmental Management Act, 1998 (No 107 of 1998) including EIA Regulations, 2014 published in Government Notice No. R. 982, R. 983, R. 984 and R. 985 in Government Gazette No. 38282 dated 04 December 2014;
16. National Environmental Management: Biodiversity Act, 2004 (No 10 of 2004);
17. National Environmental Management: Waste Act, 2009 (Act No. 59 of 2009) ("NEM: WA");
18. National Forest Act, 1998 (No 84 of 1998);
19. National Heritage Resources Act, 1999 (No 25 of 1999);
20. National Veld and Forest Fire Act, 1998 (No 101 of 1998);
21. National Water Act, 1998 (Act No. 36 of 1998), Sections 27, 28,29,30,31 and 39 (Sections dealing with General Authorisations and Water Use Licenses);

Legislative Context of the Proposed Activity

Constitution of the Republic of South Africa Act, 1996 (No. 108 of 1996)

Section 24 of the constitution (below) provides the foundation for environmental protection, promoting ecologically sustainable development and use of natural resources.

Section 24. Environment. -Everyone has the right-

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(i) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Importance to the Project: It allows the environmental rights of all South African citizens to be upheld through the implementation of all types of projects, including agricultural projects.

The National Environmental Management Act, 1998 (No. 107 of 1998)

The National Environmental Management Act (NEMA) 107 of 1998 states that the State must respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the needs of previously disadvantaged communities. It states further that sustainable development requires the integration of social, economic and environmental factors in the planning, evaluation and implementation of decisions to ensure that development serves present and future generations.

Importance to the Project: The project includes one listed activity (**Table 3**), which requires a Basic Assessment in terms of the GN No. R 983, 2014. As amended by Government Notice No. R. 326, and R. 327 published in Gazette No. 40772 of 07 April 2017.

The National Environmental Management: Biodiversity Act No. 10 of 2004

The Act provides the protection of ecosystems and species that require national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources and the establishment and functions of the South African National Biodiversity Institute (SANBI).

Importance to the Project: The BA process for the project will involve the identification, protection and management of species, ecosystems and areas of high biodiversity value.

The National Heritage Resource Act No. 25 of 1999

The act requires that the responsible heritage resource authority is notified of any new development which will change the character of the site and exceeds an area of 5000 m². The authority must be provided with the site location, details and extent of the proposed development.

Importance to the Project: A heritage impact assessment (HIA) would have to be completed as part of the BA process, if any heritage sites were identified at the project site and carried out by person/s approved by the authority.

A Heritage Impact Assessment and a Paleontological Impact Assessment study has been undertaken.

Ehlanzeni District Municipality IDP

Agriculture Key areas for intervention to facilitate growth and job creation in the agricultural sector include:

- Massive drive on infrastructure development
- Massive drive in skills development.
- Comprehensive support to small-scale farmers and agri-businesses.
- Fast-track the settlement of the outstanding land claims.
- Optimal utilisation of resituated and distributed land.

Importance to the Project: The project will play a part in the Development Framework requirements to promote growth and job creation within the agricultural sector.

City of Mbombela Local Municipality IDP

The objectives of the SDF is to ensure:

- Creation of consolidated settlement structure, to allow for the cost-effective and sustainable provision of modern-day engineering, and community services and infrastructure;
- The sustainable use of land and other resources;
- The channelling of resources to areas displaying both economic potential and development need;
- Functionally link to the main growth centres or areas of greatest economic activity;
- Unlocking of the development potential of existing towns; and
- Mitigation of existing and potential future land use conflict(s) between urban development, mining/industry, agriculture, forestry and tourism.

Importance to the Project: The project will play a part in the Development Framework requirements to promote growth and job creation within the agricultural sector.

4 Public Participation Process

The Public Participation Process (PPP) was undertaken according to Regulation 54 of the EIA Regulations, 2014, and took into consideration the Public Participation 2010 Guideline Document (DEA, 2010).

The level of public participation was determined by taking into account the scale of the anticipated impacts of the proposed project, the sensitivity of the affected environment and the degree of controversy of the project, and the characteristics of the potentially affected parties. Based on the findings of the aforementioned consideration, there was no reason to elaborate on the minimum requirements of the public participation process outlined in the EIA Regulations, 2014 or use reasonable alternative methods for people desiring of but unable to participate in the process due to illiteracy, disability or any other disadvantage.

Potentially interested and affected parties were notified of the proposed application by –

- Fixing a notice board at a place conspicuous to the public. (APPENDIX E, Annexure A & B). There was no reasonable alternative site (Section D6).
- Giving written notice to owners and occupiers of land adjacent, (APPENDIX E; ANNEXURES C, D, G and H), and organs of state having jurisdiction in respect of the proposed activity. The applicant, Barberton Valley Plantations, is the owner of the land. Consequently, a Background Information Document (BID) was prepared and distributed via email (APPENDIX E, Annexure C & D)

Table 10: List of Stakeholders

<p>The owner or person in control of that land if the applicant is not the owner or person in control of the land:</p> <p><i>The applicant is the owner or person in control of the land.</i></p> <p><i>Barberton Valley Plantations – Peter Zadro (PeterZ@saratogaholdings.com.au)</i></p>
<p>The occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken:</p> <p><i>The applicant occupies the site where the activity is to be undertaken (Barberton Valley Plantations – Peter Zadro (PeterZ@saratogaholdings.com.au)). There was no reasonable alternative site.</i></p>
<p>Owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken:</p> <p>Colile – imbewu.seed@gmail.com (076 091 6720) Siza – nkambulespc@hotmail.com (064 935 6181) Derrick – derrick@msuthu.co.za (082 8567156) Mr. Nkosi – kvm.nkosi@gmail.com (082 921 6559)</p>
<p>The municipality which has jurisdiction in the area: Mbombela Municipality (MLM) Sihle Mthembu (Sihle.Mthembu@mbombela.gov.za)</p>
<p>Any organ of state having jurisdiction in respect of any aspect of the activity:</p> <p>Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)</p>

Robyn Luyt (Rluyt@mpg.gov.za, 082 672 7868)

Mpumalanga Tourism and Parks Agency (MTPA)

Phumla Nkosi Phumla.Nkosi@mtpa.co.za
 'Khumbelo Malele' Khumbelo.Malele@mtpa.co.za

Department of Agriculture

Frans Mashamba (FransMas@nda.agric.za)
 Love Shabane (LoveS@nda.agric.za)

- Placing an advertisement in a local newspaper, the Lowvelder (31 March 2022) (APPENDIX E, Annexure E & F). No official Gazette existed at the time of the application. The proposed activity shall not have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it will be undertaken.

In terms of regulation 55(1), all organs of state which have jurisdiction in respect of the proposed activity and all persons who submitted written comments or requested, in writing, to be registered were placed on the register (APPENDIX E, Annexure I & J).

A summary of the issues raised (APPENDIX E, Annexure J) -

Table 11: Comments and Responses

Issue and Response

Name	Issue	Name	Response
T. Sithole (DARDLEA)	The applicant must demonstrate that water is available at the required capacity for irrigation purposes for the proposed site to be cleared and cultivated. Where water rights are secured, it must be confirmed whether they are currently in use and whether there is sufficient allocation remaining for the proposed cultivation.	Steven Henwood	<p>A certificate issued by the Queens River Irrigation Board verifies that the Farm Uguhleni 698 JT has an allocation of 22ha (145 200cubic meters of water) that may be abstracted and utilised.</p> <p>The land is currently undeveloped and as such none of the existing allocation is currently being utilised. This then indicates that the full 22ha of water is available and may be utilised.</p> <p>Note however that only 19.6 ha will be planted and irrigated leaving a surplus of 2,4 ha.</p> <p>See Appendix F, Annexure E for water certificate.</p>
T. Sithole (DARDLEA)	1. Please clarify what the Layout Plan "20m Ecological Buffer" refers to. The Ecological Study advises a 30m buffer from	Steven Henwood	1. Noted. The layout and sensitivity map has been amended where necessary. The reference in the layout map legend referring to a 20 meter buffer was a

	<p>the edge of all riparian areas, and your recommended "Aquatic Buffer Zone" makes reference to a 15m buffer from "Mountain Headwater" Drainage Lines and 30m from the edge of the unchanneled valley bottom wetland and seepage wetland.</p> <p>2. Furthermore, the legend in the layout plan appears not to include the medium sensitivity rating within the Ecological Buffer.</p> <p>3. The Aquatic Assessment was not included in your report.</p>		<p>typing error and incorrect. The buffers as indicated on the map are as per the specialist terrestrial and aquatic recommendations. To clarify this further a general 30 meter buffer, which incorporates the 15 meter Mountain Headwater buffer has been included in the layout map. Furthermore, all new agricultural developments will be restricted to the areas formerly cultivated.</p> <p>2. The legend and map includes all sensitivity ratings. The proposed agriculture will only take place in areas identified in the specialist reports as having a low to very low sensitivity.</p> <p>3. I am not sure how this happened. The Basic Assessment Report made available to public, and stakeholders included an aquatic report. All stakeholders have been afforded access to the full set of specialist reports and have commented on these and the DBAR. Please see proof of submission and receipt of the Draft BAR and Appendices as per Appendix E Annexure D</p>
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<p>T. Sithole (DARDLEA)</p>	<p>None of the Appendices and Annexures that you refer to on Page 39 in respect of public consultation have been included in your report (There is no Appendix E).</p>	<p>Steven Henwood</p>	<p>Noted. Again, I am not sure how this happened. The Basic Assessment Report made available to public, and stakeholders included Appendix E. All stakeholders have been afforded access to the full DBAR and its associated Appendices. Please see proof of submission and receipt of the Draft BAR and Appendices as per Appendix E Annexure D.</p>
<p>T. Sithole (DARDLEA)</p>	<p>Your Need and Desirability paragraph on Page 40 refers to the farm Montrose 290 JT. There are clearly multiple copy and paste errors that must be rectified.</p>	<p>Steven Henwood</p>	<p>Noted. This has been rectified.</p>
<p>T. Sithole (DARDLEA)</p>	<p>On Page 60 you refer to the requirement for a storm water plan, which must include retention ponds. Please clarify. If a storm water plan is indeed required to mitigate impacts, then this must be undertaken as part of the BA process.</p>	<p>Steven Henwood</p>	<p>Noted. This is a requirement and as such has been included in the BAR. See the stormwater management plan included as an appendix to the EMPr.</p>
<p>T. Sithole (DARDLEA)</p>	<p>Please be reminded that infilling activities have not been applied for or assessed and will therefore not be considered as part of this application..</p>	<p>Steven Henwood</p>	<p>Noted and agreed. There is no need for infilling.</p>

<p>T. Sithole (DARDLEA)</p>	<p>The EMPr must be amended to include all required buffer zones, and the measures to delineate and protect them.</p>	<p>Steven Henwood</p>	<p>Noted, this has been done. See the amended and updated EMPr. Specifically Section 2 - pages 11 to 13.</p>
<p>T. Sithole (DARDLEA)</p>	<p>The final BAR must provide proof that all potential and registered I&AP's, including Organs of State, were provided with access to and an opportunity to comment on the draft BAR following submission of the application form (Regulation 40(3)).</p>	<p>Steven Henwood</p>	<p>Noted.</p>
<p>T. Sithole (DARDLEA)</p>	<p>The final basic assessment report must include an issues and response report, as well as copies of and responses</p>	<p>Steven Henwood</p>	<p>Noted.</p>

	to comments received from all I&APs, including these comments		
Khumbelo Malele (MTPA)	According to the terrestrial assessment, the proposed development will occur within <i>CBA Optimal areas, moderately and heavily modified areas.</i>	Steven Henwood	Noted and agreed.
Khumbelo Malele (MTPA)	According to the freshwater assessment, the proposed development will occur within <i>ESA Important sub-catchment areas.</i>	Steven Henwood	Noted and agreed
Khumbelo Malele (MTPA)	<p>The MTPA do not object to this development and would like to recommend that:</p> <ul style="list-style-type: none"> • Prior to commencement, plant species of conservation concern must be identified and marked, and should preferably be conserved in-situ. Where this is not feasible, relevant permits for their relocation or removal must be obtained from the relevant authority. • Plant species of conservation concern that are identified for relocation must be relocated to areas of similar habitat that will not be transformed. Such species must be monitored and managed until such a time that they have, in 	Steven Henwood	<p>Noted. Conservation and preservation of species of concern will be implemented and audited through the EMPr and ECO appointed to monitor the activity.</p> <p>All buffer zones will be demarcated and maintained throughout the life cycle of the activity.</p>

	<p>consultation with the ECO, been determined to be successfully re-established.</p> <ul style="list-style-type: none"> • All buffer zones around sensitive areas/features must be maintained as ecological corridors which must be kept intact throughout the project life cycle, and must be managed in such a way to prevent erosion and alien species invasion. • The EMP submitted as part of the basic assessment report must be implemented and adhered to throughout the lifecycle of the activity. • All disturbed areas must be fully rehabilitated and protected from erosion. Rehabilitation measures must be aimed at the prevention of soil erosion and the reestablishment of indigenous vegetation. 		
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5 Need and Desirability.

The Barberton Valley Plantations wishes to cultivate macadamias on the Farm Uguhleni 698 JT.

In order to cultivate the proposed field, the area must be cleared of the natural bush that occurs on the site. In addition to this, and due to the current agricultural scale of economy, the applicant wishes to extend his current farming area thus increasing the total area available for planting.

The desire to utilise the proposed field, was precipitated by the fact that the most economically viable option available to the owner is to optimize the use of existing resources, while adding further value by extending and incorporating additional sections of arable land. A large section adjacent to the proposed field is currently disturbed and already planted to macadamias.

The proposed site is ideal for agriculture (specifically growing macadamias), as the soils, water and growing region are ideal.

6 Feasible and Reasonable Alternatives

6.1 Legislative Background

The very consideration of a development in terms of EIA is about the consideration of alternatives related to the development. The NEMA prescribes that all environmental impact assessments, which are to be utilised in informing an application for environmental authorisation, must identify and investigate the alternatives to the activity on the environment and include a description and comparative assessment of the advantages and disadvantages that the proposed activity and feasible and reasonable alternatives will have on the environment and on the community, that may be affected by the activity. If, however, after having identified and investigated alternatives, no feasible and reasonable alternatives exist, no comparative assessment of alternatives, beyond the comparative assessment of the preferred alternative and the option of not implementing the activity, is required during the assessment phase. In this instance, the EAP managing the application must provide the competent authority/DARDLEA with detailed, written proof of the investigation(s) undertaken and motivation indicating that no reasonable or feasible alternatives, other than the preferred alternative and the no-go option.

6.2 Definition of Alternatives

“Alternatives”, in relation to a proposed activity, means different means of meeting the general purposes and requirements of the activity, which may include the following types of alternatives:

- The property on which, or location where, it is proposed to undertake the activity.
 - Refers to both alternative properties as well as alternative sites on the same property.
- The type of activity to be undertaken.
 - Provision of public transport rather than increasing the capacity of roads.
- The design or layout of the activity.
 - Different architectural and or engineering designs.
 - Consideration of different spatial configurations of an activity on a particular site (Site Layout)
- The technology to be used in the activity.
 - Option of achieving the same goal by using a different method or process.
- The operational aspects of the activity.
- Demand
 - When a demand for a certain product or service can be met by some alternative means, i.e. the demand for electricity/storm water controls could be met by supplying more energy or using energy more efficiently by managing demand.
- Input
 - Input alternatives for projects that may use different raw materials or energy sources in their processes.
- Routing
 - Alternative routes generally applies to linear developments (pipeline routes).
- Scheduling and Timing
 - Where a number of measures might play a part in an overall programme, but the order in which they are scheduled will contribute to the overall effectiveness of the end result.
- Scale and Magnitude
 - Activities that can be broken down into smaller units and can be undertaken on different scales, i.e. for a housing development there could be the option 10, 15 or 20 housing units.
- The option of not implementing the activity (no-go option).
 - The no-go option is taken to be the existing rights on the property, and this includes all the duty of care and other legal responsibilities that apply to the owner of the property. All the applicable permits must be in place for a land use to be an existing right.

The key criteria when identifying and investigating alternatives are that they should be “feasible” and “reasonable”. The “feasibility” and “reasonability” of and the need for alternatives must be determined by considering, inter alia, (a) the general purpose and requirements of the activity, (b) need and desirability, (c) opportunity costs, (d) the need to avoid negative impact altogether, (e) the need to minimise unavoidable negative impacts, (f) the need to maximise benefits, and (g) the need for equitable distributional consequences. The (development) alternatives must be socially, environmentally and economically sustainable. They must also aim to address the key significant impacts of the proposed residential development by maximising benefits and avoiding or minimising the negative impacts.

Identification and Investigation of Alternatives Including Motivations

Given the aforementioned definition and description of alternatives, alternatives for investigation in this assessment were first identified by considering whether the different types of alternatives could meet the general purposes and requirements of the need to expand Barberton Valley Plantations business model and offer increased capacity/services to the macadamia growers in the region, and subsequently constitute a comparable activity. Thereafter, the need for an alternative was assessed to determine whether it warranted further investigation. Certain alternatives could not be considered as legitimate alternatives for comparable assessment from the onset of the assessment process because they apply to aspects/parts of the proposed activity. Consequently, they were considered throughout the assessment process to address site-specific impacts when the need for mitigation was identified by the relevant specialist studies.

Purpose and Requirements of clearing and planting macadamias

The purpose for clearing and planting macadamias is to increase Barberton Valley Plantations business model.

Alternative No. 1: Property and Location

Purpose and Requirements

The development of the proposed site is a right held by the owners and will also improve the ability of the owner's to successfully run and operate their business in a financially viable manner. Moreover, the size and suitability of the proposed site as well as the fact that this site is owned by the applicant, precludes consideration of alternative properties. Because macadamias do not yield as much as other tree crops, it is necessary to have more trees for a viable operation. The addition of this "new area" to the existing macadamia crops will add immense value and improve the economic viability of the entire operation.

An alternative property does **not** meet the needs as described above. Neither does an alternative site, given that the proposed site is located adjacent to currently disturbed/cultivated lands owned by the applicant. Moreover, the site itself was rated as having a moderate to low biodiversity value. In addition to this and considering the aesthetic value and relatively high ecological sensitivity of properties and other sites in the area, an alternative location is **unable** to meet the needs as described. The applicant would thus like to plant and develop the site identified.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

Activity can only occur on land within close proximity to their current operation and moreover, the size and suitability of the proposed site as well as the fact that this site is owned by the applicant, precludes consideration of alternative properties. To suggest an alternative site in the surrounding ecologically sensitive areas would also be **unreasonable**.

An alternative location on the applicant's property was considered but due to the proposed site constituting old lands and that the possible alternative adjacent undisturbed areas surrounding the proposed site are ecologically sensitive, it would thus be unreasonable to consider these virgin areas for development.

Alternative No. 2: Type of Activity

Purpose and Requirements

The specific nature of this activity, fundamentally to increase Barberton Valley Plantations business model, does **not** afford alternative types of activities that can meet the same purposes or requirements, specifically providing the owners of the land the ability improve, successfully market, run and ultimately operate their business in a financially viable manner.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

The purpose and requirements for increasing Barberton Valley Plantations business model and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner, cannot be achieved by using an alternative type of activity. Consequently, this type of alternative is **not applicable**.

Alternative No. 3: Design and Layout

Purpose and Requirements

The purpose and requirements for increasing Barberton Valley Plantations business model and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner, **can** be achieved using different layout and or engineering designs, and by considering different spatial configurations of the development on the particular site (Site Layout).

Methodology

Specialist studies were undertaken during the assessment process to identify potential impacts on the environment and community/neighbours and recommend appropriate mitigations to avoid or minimise negative impacts or enhance beneficial impacts. Those mitigations informed the final and preferred Site Layout (Appendix A, Annexure B).

Criteria used to investigate and assess alternatives

The Site Layout was designed to take cognisance of and address specific impacts. The assessment of the specific impacts associated with the Site Layout included a study of the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources, and the degree to which the impact can be mitigated (Section D 6).

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

Whilst alternative designs and or site layouts are reasonable, particularly given the need to avoid negative impacts or to minimise unavoidable negative impacts, the extent of those changes is restricted by the site itself and surrounding ecological sensitivities. Furthermore, the changes are informed by the findings contained in the relevant specialist studies. Consequently, this type of alternative had to be considered throughout the assessment process and evolve incrementally as and when the impacts were identified by the relevant specialist studies. The final and preferred site layout is an outcome of the aforementioned process or the 'end result'. The fact that it could not be predicted from the onset of the assessment process made it impossible to propose as an alternative for assessment.

Alternative No. 4: Technology

Purpose and Requirements

The purpose and requirements for increasing Barberton Valley Plantations business model and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner, **can** be met by this type of alternative, specifically by using different technologies (methods or processes during the construction)

Methodology

Various technologies for the planting of macadamias were evaluated by the project team. Specialist studies were undertaken during the assessment process to identify potential impacts on the environment and community and recommend appropriate mitigations to avoid or minimise negative impacts or enhance beneficial impacts. Those mitigations informed the final and preferred technologies and materials to be used.

Criteria used to investigate and assess alternatives

Recommendations made regarding the utilisation of proper and suitable technologies to plant macadamias were undertaken to address specific impacts. The assessment of the specific impacts associated with the site layout included a comparison of the nature of the impact, the extent and duration of the impact, the probability of the impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources, and the degree to which the impact can be mitigated

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

The purpose and requirements of the proposed development can be achieved by using this type of alternative, 'technology'. Consequently, this type of alternative is applicable. In addition, alternative technologies were sought throughout the assessment process to address specific impacts identified by the specialist studies, in the manner described in the above-mentioned alternative for 'Design and Layout (Alternative No. 3).

Alternative No. 5: Operational Aspects

Purpose and Requirements

Whilst alternative operational aspects (procedures) can meet the purpose for increasing Barberton Valley Plantations business model, they **cannot** meet the purpose of realising the owner's right to improve, run and ultimately operate their business in a financially viable manner. Consequently, the proposed development has been proposed to directly address operational and management flaws that could not be accomplished by simply revising operational procedures.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

Comparative assessment of alternative operational aspects (procedures) against the development of planting macadamia trees, highlight that alternative operational procedures (within the existing ambit) could not reasonably achieve the same operational efficiency requirements that the proposed project would.

Alternative No. 6: Demand

Purpose and Requirements

The purpose and requirements for increasing Barberton Valley Plantations business model and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner **cannot** be met by this type of alternative, specifically by reducing the demand (or need) for the proposed activity. The owner is entitled to expand current operations and in so doing improve, successfully market, run and ultimately operate their business in a financially viable manner. Within reason this right cannot be unreasonably withheld.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

The purpose and requirements for increasing Barberton Valley Plantations business model and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner **cannot** be achieved by using this type of alternative, 'demand'. Consequently, this type of alternative is not applicable. Nevertheless, alternative means were sought throughout the assessment process to address specific impacts identified by the specialist studies, in the manner described in the above-mentioned alternative for 'Design and Layout (Alternative No. 3).

Alternative No. 7: Input

Purpose and Requirements

The purpose and requirements for increasing Barberton Valley Plantations business model region and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner can be met using different raw materials or energy sources.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

However, the need for alternative inputs (to address site-specific impacts) cannot be predicted at the onset of the assessment process and is, therefore, not reasonable. However, alternative raw materials or energy sources were sought throughout the assessment process to address specific impacts identified by the specialist studies, in the manner described in the above mentioned alternative for 'Design and Layout (Alternative No. 3).

Alternative No. 8: Routing

Purpose and Requirements

The purpose and requirements for increasing Barberton Valley Plantations business model and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner **cannot** be met using an alternative route. This specific type of alternative generally applies to linear developments, such as pipeline routes.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

This type of alternative, 'Routing', is not applicable. Nevertheless, alternative routes for internal services were sought throughout the assessment process to address specific impacts identified by the specialist studies, in the manner described in the above-mentioned alternative for 'Design and Layout (Alternative No. 3).

Alternative No. 9: Scheduling and Timing**Purpose and Requirements**

The purpose and requirements for increasing Barberton Valley Plantations business model as well as the services/capacity rendered to the macadamia growers in the region and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner **can** be met using alternative scheduling and timing, specifically changing the order in which activities are scheduled to contribute to the overall effectiveness of the end result.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

However, the need for alternative scheduling or timing (to address site-specific impacts) cannot be predicted at the onset of the assessment process and is, therefore, not reasonable. However, alternative scheduling or timing was sought throughout the assessment process to address specific impacts identified by the specialist studies, in the manner described in the above-mentioned alternative for 'Design and Layout (Alternative No. 3). For example, rehabilitation should not be left until the end of construction, etc.

Alternative No. 10: Scale and Magnitude**Purpose and Requirements**

The purpose and requirements for increasing Barberton Valley Plantations business model as well as the services/capacity rendered to the macadamia growers in the region and realising the owner's right to improve, successfully market, run and ultimately operate their business in a financially viable manner **cannot** be met using an alternative scale or magnitude, specifically a smaller physical footprint.

Methodology

NA

Criteria used to investigate and assess alternatives

NA

Reasoned explanation why an alternative was or was not found to be reasonable or feasible

This type of alternative, 'Scale and Magnitude', is not applicable. The growing of macadamias is limited by financial and operational viability, and this is directly linked to an economy of scale.

Alternative No. 11: No-go Option

The option of not implementing the activity (no-go option), was used as the benchmark against which all impacts associated with the proposed development were assessed.

Conclusion

Some types of alternatives were not applicable to the nature of the proposed activity, including its purpose or requirements ('Type of Activity', 'Technology', 'Demand', 'Routing' and 'Scale and Magnitude'). A range of different types of alternatives did exist, but not all warranted investigation ('Property and Location', 'Design and Layout', 'Input', 'Scheduling and Timing'). Based on the findings of the investigation that was undertaken (of 'Operational Aspects') and reasoned motivation there was no verifiable evidence for the existence of any reasonable and feasible alternative(s) other than the preferred option and the no-go option, at the time of this environmental impact assessment process. Consequently, no reasonable and feasible alternatives other than the preferred option and the no-go option were identified, described and assessed. Having said that, alternatives, specifically modifications and changes to activities in order to prevent and/or mitigate environmental impacts, were considered throughout the assessment process. The development proposal was amended in an incremental manner throughout the EIA process to address impacts and issues, as and when the need for mitigation was identified.

7 Environmental Impacts

The purpose of the assessment is to synthesise and analyse information relevant to the environmental impacts of a proposal. In order to achieve this, two elements, namely the outline of methodology used, and the systematic assessment of the impacts are required.

The environmental significance scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can be ecological, economic, social, or all of the aforementioned. The evaluation of the significance of an impact relies heavily on the values of the person making the judgement. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Sub-Section 7.4 identifies the issues associated with the proposed development, providing the significance scale and mitigation measures to reduce negative impacts and enhance positive impacts. Section 7.1 provides an explanatory note on the methodology adopted for assessing the significance of the identified impacts.

To facilitate informed decision-making, EIA's must endeavour to come to terms with the significance of the potential environmental impacts associated with particular development activities. Despite their attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, EIA processes can never completely escape the subjectivity inherent in attempting to define significance. Recognising this, we have attempted to address potential subjectivity in the current process as follows:

- Being explicit about the difficulty of being completely objective in the determination of significance, as outlined above.
- Developing an explicit methodology for assigning significance to impacts and outlining this methodology in detail in this BAR. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing toward determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the BAR with a clear summary of how the assessor derived the assigned significance.
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties.

Although these measures may not totally eliminate subjectivity, they provide an explicit context within which to review the assessment of impacts.

7.1 Assessment Methodology

This section outlines the methodology used to assess the significance of the potential environmental impacts. For each impact, the EXTENT (spatial scale), MAGNITUDE and DURATION (time scale) are described. These criteria are used to ascertain the significance of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described represents the full range of plausible and pragmatic measures and does not imply that they would or should be implemented. The tables below show the scale used to assess these variables, and define each of the rating categories.

Table 12: Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	Regional	Beyond 5 km of the proposed activity.
	Local	Within 5 km of the proposed activity.
	Site specific	On site or within 100 m of the site boundary.
Magnitude of impact (at the indicated spatial scale)	High	Natural and/ or social functions and/ or processes are <i>severely</i> altered.
	Medium	Natural and/ or social functions and/ or processes are <i>notably</i> altered.
	Low	Natural and/ or social functions and/ or processes are <i>slightly</i> altered.
	Very Low	Natural and/ or social functions and/ or processes are <i>negligibly</i> altered.
	Zero	Natural and/ or social functions and/ or processes remain <i>unaltered</i> .
Duration of impact	Construction	Up to 2 years.
	Short Term	0-5 years (after construction).
	Medium Term	5-15 years (after construction).
	Long Term	More than 15 years (after construction).

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in Table 13.

Table 13: Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High	<ul style="list-style-type: none"> High magnitude with a regional extent and long term duration. High magnitude with either a regional extent and medium term duration or a local extent and long term duration. Medium magnitude with a regional extent and long term duration.
Medium	<ul style="list-style-type: none"> High magnitude with a local extent and medium term duration. High magnitude with a regional extent and short term duration or a site specific extent and long term duration. High magnitude with either a local extent and short term duration or a site specific extent and medium term duration. Medium magnitude with any combination of extent and duration except site specific and short term or regional and long term. Low magnitude with a regional extent and long term duration.
Low	<ul style="list-style-type: none"> High magnitude with a site specific extent and short term duration. Medium magnitude with a site specific extent and short term duration. Low magnitude with any combination of extent and duration except site specific and short term. Very low magnitude with a regional extent and long term duration.
Very low	<ul style="list-style-type: none"> Low magnitude with a site specific extent and short term duration. Very low magnitude with any combination of extent and duration except regional and long term.
Neutral	<ul style="list-style-type: none"> Zero magnitude with any combination of extent and duration.

Once the significance of an impact has been determined, the PROBABILITY of this impact occurring as well as the CONFIDENCE in the assessment of the impact, are estimated using the rating systems outlined in Table 14 and Table 15 respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly the REVERSIBILITY is estimated using the rating system outlined in Table 16.

Table 14: Definition of probability ratings

PROBABILITY RATINGS	CRITERIA
Definite	Estimated greater than 95 % chance of the impact occurring.
Highly probable	Estimated 80 to 95 % chance of the impact occurring.
Probable	Estimated 20 to 80 % chance of the impact occurring.
Possible	Estimated 5 to 20 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 15: Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 16: Definition of reversibility ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	The activity will lead to an impact that is permanent.
Long Term	The impact is reversible within 2 to 10 years after construction.
Short Term	The impact is reversible within the 2 years of construction.

7.2 Subjectivity in Assigning Significance

To facilitate informed decision-making, EIA's must endeavour to come to terms with the significance of the potential environmental impacts associated with particular development activities. Despite their attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, EIA processes can never completely escape the subjectivity inherent in attempting to define significance. Recognising this, we have attempted to address potential subjectivity in the current process as follows:

- Being explicit about the difficulty of being completely objective in the determination of significance, as outlined above.
- Developing an explicit methodology for assigning significance to impacts and outlining this methodology in detail in this BAR. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing toward determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the BAR with a clear summary of how the assessor derived the assigned significance.
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties.

Although these measures may not totally eliminate subjectivity, they provide an explicit context within which to review the assessment of impacts.

7.3 Consideration of Cumulative Impacts

The National Environmental Management Act requires the consideration of cumulative impacts as part of any environmental assessment process. EIA's have traditionally, however, failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires co-ordinated institutional arrangements; and
- EIA's are typically carried out on specific developments, whereas cumulative impacts may result from broader biophysical, social and economic considerations, which typically cannot be addressed at the project level.

In terms of the proposed agriculture the following cumulative impacts have specifically been identified:

1. Loss of Habitat with a Very High Terrestrial Biodiversity Theme (EST), CBA:

The loss of habitat from agricultural activities may result in a localised cumulative impact. The post mitigation significance of the cumulative impact is however considered to be **Low-Medium**.

2. Invasion of Natural Habitat by Alien Plants:

The loss of habitat from invasion from alien plant species, which is already evident, may result in a regional cumulative impact and should therefore be regarded as having **Medium** significant. The post mitigation significance of the cumulative impact is however considered to be **Low**.

3. Potential of Soil Erosion

The loss of topsoil and sedimentation of natural habitat may result in a local cumulative impact and will likely only happen after heavy rain events. However, due to the small spatial extent and nature of the proposed development, this should be regarded as only having **Low-Medium** significant. The post mitigation significance of the cumulative impact is however considered to be **Low**.

4. Increase in Poaching Activities

Due to the small spatial extent and high degree of disturbance within the study area, the cumulative effect of this impact is **Low**.

5. Destruction of Protected Plants

Due to the high disturbance levels currently in place, and the relatively few plants present within areas suitable for agriculture, this impact will not have a detrimental effect on the ecology of the area. The cumulative impact is therefore **Low**.

6. Destruction of Habitat for Faunal SCC

The ongoing destruction of riparian vegetation and infestation from alien plants in the general area is cause for concern. However, long-term protection of riparian habitat will reduce the cumulative Impact to **Low-Medium**.

7. Impact of agriculture on flow regime

The most likely developments in the vicinity of Uguhleni in the near future is further clearing of vegetation for cultivation. This is certain to increase water demands and also likely to increase sediment runoff into receiving watercourses. The road network is likely to increase with future development in the area and this is likely to increase conveyance and drainage rates, and this is likely to increase the magnitude of stormwater peaks and flood peaks, and this could have detrimental impacts on stream bank stability and infrastructure such as stream crossings (i.e. culverts, causeways and bridges). The severity of the cumulative impacts on the flow regime and water quality were therefore rated as **Low**.

8. Use of pesticides

The biggest threat to the watercourse is likely to be associated with runoff and aerial drift of pesticides, herbicides and fertilisers. The cumulative impacts on water quality may therefore be significant, and this highlights the need for terrestrial vegetation buffer zones to protect seepage wetlands from runoff from surrounding orchards. Cumulative impacts are likely to continue for the duration of operation, so duration was rated as “4”. The proposed development is a once-off activity, so frequency was rated as “1”. The probability that the proposed re-aligned fields will have measurable cumulative impacts is low. If mitigation measures suggested for the control of pesticides and chemicals are followed and implemented correctly, the significance rating of this impact can be reduced to **Low**.

7.4 Construction Phase Impacts

The construction phase impacts are those impacts on the biophysical and socio-economic environment that would occur during the construction¹ phase of the proposed project. They are inherently temporary in duration but may have longer lasting effects. The construction phase impacts could potentially include:

The bio-physical issues identified include:

- Fauna and Flora (Destruction of habitat)
- Impact on wetland
- Loss of topsoil / Soil Erosion
- Ground and surface water impact
- Geology and soils

The socio-economic impacts identified include:

- Noise pollution
- Visual pollution
- Traffic impact
- Historical impact
- Employment Opportunities (+)

A summary of the construction phase impacts (assessed within the final BAR) is provided below.

Table 17: Summary of construction impacts

Ref. (Pg)	Description of impact	Significance of Impact	
		Without Mitigation	With Mitigation
Construction Phase Impacts			
60	Fauna and Flora	Medium (-)	Low (-)
62	Aquatic Ecosystems	Medium (-)	Low (-)
Error! Bookmark not defined.	Historical	Low (-)	Low (-)
66	Loss of Topsoil and Soil Erosion (Hydrological)	Medium (-)	Low (-)
67	Ground and Surface Water Impact	Medium (-)	Low (-)
68	Noise Pollution	Medium (-)	Low (-)
69	Visual Impact	Medium (-)	Low (-)
70	Employment Opportunities	Low (+)	High (+)

A summary of the integrated construction phase impacts:

¹ In this regard construction should be interpreted as those activities associated with the clearing and planting of the proposed fields.

Table 18: Summary of integrated construction impacts for Uguhleni 698 JT

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Site specific/ Local	Site specific/ Local
Magnitude	High (-)	Medium Low (-)
Duration	Construction	Construction
Significance	Medium (-)	Low (-)
Probability	Highly Probable	Highly Probable
Confidence	Certain	
Reversibility	Short Term	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

7.4.1 Fauna and Flora

Description of the environment

The proposed agricultural development is situated the farm Uguhleni 698 JT, approximately 15 km west of Barberton in the Ehlanzeni District, Mpumalanga Province, South Africa (Figure 1). The total area surveyed measured 37 ha. The study area formed the direct Project Area Of Influence (PAOI), with a 1 km buffer around the farm being considered as the indirect PAOI. This buffer was chosen due to the high levels of transformation present surrounding the study area. Most of the area to the north, east and south of the direct PAOI is agriculturalised, with some remaining natural vegetation occurring to the west of the direct PAOI. The perennial Queens River lies 100 m from the southern boundary at its closest point. The large Selapi Village is situated immediately to the south of the study area.

Five vegetation communities are represented within the study area, namely *Dichrostachys cinerea* – *Sporobolus pyramidalis* Secondary Woodland (**Low SEI**), *Bridelia micrantha* – *Syzygium cordatum* Riparian Forest (**High SEI**), *Jacaranda mimosifolia* – *Hippobromus pauciflorus* Riparian Thicket (**Medium SEI**), *Dombeya rotundifolia* – *Jacaranda mimosifolia* Short Thicket (**Low SEI**), and *Phragmites mauritianus* Wetland (High SEI).

Table 19: Fauna and Flora

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Regional	Site
Magnitude	Medium (-)	Low (-)
Duration	Short term	Short term
Significance	Moderate (-)	Low (-)
Probability	Low (-)	Low (-)
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

- **Loss of Habitat with a Very High Terrestrial Biodiversity Theme (EST), CBA: Optimal Conservation Status and Vegetation Communities with High SEI** – The study area is situated within an area assessed as having Very High Terrestrial Biodiversity Theme within the Environmental Screening Tool of the DEA. Additionally, portions of the study area are situated within an area assessed as CBA: Optimal in the MBSP, and two vegetation communities are assessed as having High SEI (Riparian Forest and Wetland). According to SANBI's 2020 guidelines, impacts in these areas should be avoided. Destruction of sensitive natural vegetation will therefore result in a **High** significance, but with mitigation, this can be lowered to **Low-Medium**.
- **Invasion of Natural Habitat by Alien Plants** – A very high total of 46 alien plant species were located within the study area during fieldwork, 21 of which are declared alien invasives. Many of these species are dominants or co-dominants in some of the vegetation communities. Additional invasion is highly likely as construction activities could introduce seeds which may thrive in bare soil resulting from construction activities. The significance of this impact is therefore **High** but, with the implementation of appropriate mitigation, the significance could be reduced to **Low**.
- **Potential of Soil Erosion** – Rain and sediment runoff from loose and bare soil around the cleared land parcels are likely to result in some erosion and downstream sedimentation. Although the pre-mitigation impact of this is **Low-Medium**, consideration must be given to the timing of clearing activities. Clearing during the dry season and the careful and correct implementation of a re-vegetation and soil erosion plan will reduce this impact to **Low**.
- **Increase in Poaching Activities** – Unsupervised construction workers may participate in small-scale poaching through setting snares or traps for bushmeat. This may affect the confirmed NT-listed Natal Red Duiker. Medicinal plants may also be harvested for muthi. Due to the current lack of access controls, mitigation measures are redundant. The impact is likely to be **Low-Medium**.
- **Destruction of Protected Plants** – Three nationally and five provincially protected plant species were confirmed during fieldwork. Some of these species may be destroyed during clearing. However, very few plants were located within the Secondary Woodland community, which was formerly cultivated, and the severity of this impact is rated as Small. The overall significance of this impact pre-mitigation is **Medium**. With the implementation of potential mitigation measures, the post-mitigation significance is **Low-Medium**.
- **Destruction of Habitat for Faunal SCC** – One mammal listed as NT was confirmed from Riparian Forest / Thicket during fieldwork (Natal Red Duiker). In addition, one mammal listed as NT (Serval) and one bird listed as VU (Crowned Eagle) may occasionally forage within the study area. The overall significance of this impact pre-mitigation is **Medium**. With the implementation of potential mitigation measures, the post-mitigation significance can be reduced to **Low**.

Mitigation measures

- It is suggested that all new agricultural developments be restricted to the areas formerly cultivated and that a 30 m conservation buffer be implemented around the edge of all riparian areas and drainage lines.
- The placing of all proposed agricultural lands within the Secondary Woodland and exclusion of all other vegetation communities from development will reduce the overall impact to Low.
- An independent Environmental Compliance Officer must be appointed to monitor compliance
- with the RoD during all phases of construction; and
- Bulk clearing of vegetation should be restricted to the dry months between April and September to reduce erosion and subsequent sedimentation.

- Avoid the destruction of all protected plants, wherever possible. • If plants are located within the area to be cleared, then a destruction permit from the relevant authority should be applied for.
- In order to comply with the National Environmental Management: Biodiversity Act (Act No. 10 OF 2004), all listed invasive exotic plants as indicated in Appendix 1 of the ecology report should be targeted and controlled.
- An alien plant control plan should be compiled to address the inevitable invasion that will follow the resultant bare soil after construction work. Once clearing commences, regular monitoring of the study area and adjacent natural habitat should take place to ensure that no woody alien species are establishing. If located, all plants should be destroyed. This is not applicable to annual “weeds” which are significantly harder to control and will also assist with the binding of loose soil within the construction site.
- It is important that weed control, if involving herbicides, be managed correctly to reduce the impact on the adjacent natural vegetation.
- Regular inspections should be made to determine if any additional alien plants have established.
- It is recommended that clearing be conducted in the dry months between April and September, prior to the onset of the rains. The seasonal arrival of the rain season subsequent to construction will then allow for the natural re-vegetation of bare areas, from the seedbank within the soil. Suitable drains and other stormwater infrastructure should be constructed in areas where run-off is likely. Application of these measure are likely to reduce the impact significance to Low, which would require no further application of the Mitigation Hierarchy.
- Due to the area surrounding the proposed development site appearing to be accessible to the general public, no appropriate mitigation measures can be made. The erection of a boundary fence and implementation of strict access controls may reduce the impact rating to Low, which would require no further application of the Mitigation Hierarchy.

Provided the recommendations suggested in this report are followed, there is no objection to the proposed developments on Uguhleni in terms of the terrestrial ecosystems of the study area.

7.4.2 Impact on Aquatic Ecosystems

Description of the environment

Five hydro-geomorphic aquatic ecosystem type was identified within the study area as follows:

1. Mountain Headwater” Drainage Lines
2. Mountain Stream” Drainage Line
3. Upper Foothills
4. Unchannelled Valley Bottom Wetland
5. Seepage Wetland

Ecological Importance of the aquatic ecosystems within the Study Area was rated as **Moderate**.

Functional Importance of the “Mountain Headwater” Drailane Lines was rated as **Low**, while that of the Seepage Wetland and the Unchanneled Valley Bottom Wetland was rated as **Moderate**.

Direct Human Benefits were rated as **Very Low**.

Table 20: Impact on aquatic ecosystems

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Site	Site
Magnitude	High (-)	Medium (-)
Duration	Short term	Short term
Significance	Moderate (-)	Low (-)
Probability	Highly Probable	Probable
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

Detailed scoring of the Risk Assessment on aquatic ecosystems is included in Appendix I of the aquatic report. The following section describes the key issues.

Construction Phases

Impact of Bulk Earthworks on Aquatic Habitats

In the absence of mitigation, bulk earthworks during construction would impact directly on 0.5 ha of Unchannelled Valley Bottom Wetland; 0.4 ha of Seepage Wetland; and 900 m of episodically active “Mountain Headwater” Drainage Lines. These direct impacts can be avoided, and potential indirect impacts can be minimised, by ensuring that no development takes place within 30 m from the two wetlands within the proposed development area, and within 15 m of the episodic “Mountain Headwater” Drainage Line, as shown in Figure 7-1. The severity of the potential residual impacts on the flow regime, water quality, aquatic habitats and aquatic biota are expected to be minimal, so these aspects were rated as “1”. The spatial scale of the residual direct impacts will be avoided, while the spatial scale of residual indirect impacts are likely to be localised, so spatial scale was rated as “1”. Potential residual impacts of bulk earthworks on aquatic ecosystem are likely continue for the duration of operation, so duration was rated as “4”. The frequency of activity is once-off, so this was rated as “1”. The probability that the proposed development will impact negatively on aquatic habitats is unknown but unlikely, so frequency was rated as “2”. The extent of potential impacts on aquatic habitats will be easily observed, and so detection was rated as “1”. The overall significance score is 54, which is marginally within the “Moderate” risk category, but the method allows for a score of 54 to be classified as “Low” if the specialist considers the risks to be low. The overall risk of the re-aligned development on wetland and riparian habitat is rated with high confidence, as **Low**.

Impact of Bulk Earthworks on Sediment Runoff and Deposition

Bulk earthworks during construction is likely to have indirect impacts on surface water quality and aquatic habitats because of runoff and deposition sediments from the development areas into the receiving watercourses. The proposed development is therefore expected to increase turbidity and bed load in the receiving watercourses during storm events. The severity of this impact on water quality and aquatic habitats was rated as “2”. Elevated sediments are unlikely to affect the flow regime, and no taxa that are sensitive to elevated turbidity were recorded or expected in the Area of Influence, so the severity the flow regime and biota were rated as “1”. The spatial scale of this impact could extend beyond the proposed site but not beyond the boundary of the Study Area, so spatial scale was rated “2”. Sediment transport is expected to decline once the orchards become established, but deposition of sediments observed in the stream and Valley Bottom Wetland in February 2019 show that bulk earthworks associated with bush clearing and agricultural development can have long-term ecological consequences. The duration of this impact was therefore rated as “2”. Bulk

earthworks is a once-off event, so the frequency of activity was rated as “1”. The probability that sediment deposition will impact negatively on aquatic ecosystems is unknown but unlikely, so frequency was rated as “2”. The extent of direct impacts will be moderately easy to observe, so detection was rated as “2”. The overall risk of the re-aligned development on sediment runoff and deposition is rated with high confidence, as **Low**.

Impact of Bulk Earthworks on Alien Invasive Vegetation

Disturbance of soil caused by bulk earthworks during construction is likely to create conditions suitable for further proliferation of alien invasive vegetation. The proposed development site and surrounding aquatic ecosystems are heavily infested with alien vegetation because of historical agricultural development. Further proliferation can be managed by implementing a programme to control the spread of alien invasive vegetation. The severity of this potential impact on the flow regime, water quality, habitat and biota were therefore rated as “1”. The spatial scale of this impact could extend beyond the proposed site but not beyond the boundary of the Study Area, so spatial scale was rated “2”. Potential impacts of bulk earthworks on the spread of alien vegetation are likely to be long-term, so duration was rated as “4”. Bulk earthworks is a once-off activity, so frequency of activity was rated as “1”. The probability that further spread of alien vegetation will impact measurably on aquatic ecosystems is unknown but unlikely, so frequency was rated as “2”. Alien vegetation is easily observed, so detection was rated as “1”. The overall risk of the re-aligned development on further spread of alien invasive vegetation is rated with high confidence, as **Low**.

Operational Phase

Impact of Agricultural Production on Surface Water Quality

Agricultural return flows and drift of foliar application of fertilizer and pesticides during operation could impact negatively on surface water quality in receiving watercourses, and this increases the risks of eutrophication and associated algal blooms. Aquatic biota inhabiting nearby aquatic ecosystems are likely to be tolerant of water quality deterioration, so the risks to aquatic biota are likely to be low. The severity of the potential impact on water quality is unknown but potentially harmful, so this aspect was rated as “2”. The severity of the potential impacts on the flow regime, aquatic habitats and biota are likely to be insignificant or unmeasurable, so these were rated as “1”. The spatial extent of water quality deterioration may extend to neighbouring properties, so this aspect was rated as “2”. Potential impacts on water quality will continue for as long as the development is operational, and for this reason duration was rated as “4”. The probability that the proposed re-aligned fields will impact negatively on surface water quality is unknown but highly unlikely, so frequency was rated as “2”. Potential impacts on surface water quality will be easily observed, and so detection was rated as “1”. The overall significance score is 65, which is marginally within the “Moderate” risk category, but the method allows for a score of 65 to be classified as “Low” if the specialist considers the risks to be low. The overall risk of the re-aligned development on surface water quality is rated with low confidence, as **Low**.

Impact of Erosion

The magnitude of stormwater runoff is likely to increase because of increased hardened surfaces and increased road network associated with access roads. Increased stormwater runoff increases the risks of erosion, particularly along “Mountain Headwater” Drainage Lines, so the severity of elevated stormwater runoff on the flow regime and aquatic habitats were rated as “2”. Elevated stormwater runoff is unlikely to impact measurably on surface water quality or biota, so these aspects were rated as “2”. The spatial extent of erosion risks is expected to be localised, so this aspect was rated as “1”. Potential impacts of stormwater runoff will continue for as long as the development is operational, so duration was rated as “4”. The probability that the proposed realigned fields will impact negatively on stormwater runoff is low, so frequency was rated as “1”. Erosion is easily observed, and so detection was rated as “1”. The overall significance score is 52, which is marginally within the “Moderate” risk

category, but the method allows for a score of 52 to be classified as “Low” if the specialist considers the risks to be low. The overall risk of the re-aligned development on erosion is rated with low confidence, as **Low**.

Mitigation measures

- **Aquatic Buffer Zones.** Aquatic buffer zones of no development apart from access roads that cross drainage lines are recommended. Access roads must be routed to minimise crossings of drainage lines. The following aquatic buffer zones are recommended (Figure 6):
 - **15 m** on either side of all episodic “Mountain Headwater” Drainage Lines. The aim of this buffer zone is to minimise the risks of erosion.
 - **30 m** from the outer edge of the Unchanneled Valley Bottom Wetland and Seepage Wetland (forest patch). The aim of the buffer zone is to maintain the ecological integrity and functioning of these wetlands by avoiding direct impacts and minimizing indirect impacts that could be associated with the proposed development. A buffer zone of 30 m is recommended for these wetlands because:
 - the slope of the surrounding topography is steep and sufficient to generate significant surface runoff during storm events, so a wide buffer zone around these areas is appropriate;
 - the Seepage Wetland constitutes what appears to be a permanent spring, and as such, a wide buffer zone is appropriate;
 - both of these wetlands remain functionally intact and provide important ecological goods and services, including biodiversity support, grazing for cattle, and nutrient assimilation, so a wide buffer is appropriate so as to protect these services; and
 - vegetation cover in and around the wetlands is generally sparse, and this is likely to be more so after fire, so a wide buffer zone is appropriate.
- **Stormwater Management Plan.** A Stormwater Management Plan must be developed for the proposed development and the associated access roads. The design of the stormwater system must aim to reduce risks of sediment transport and water quality deterioration by:
 - stormwater runoff must be managed to avoid elevated peak flows from impacting on watercourses. High water velocity greatly increases the erosion risk so drains that convey such water should contain energy brakes, such as lining with stones, concrete, grass or gabions to reduce the water velocity and therefore erosion;
 - use of multiple smaller discharges rather than a few large discharges;
 - appropriate diversion of stormwater runoff from existing and proposed access to avoid siltation of watercourses; and
 - retention ponds, where appropriate, to reduce the magnitude of stormwater flows;
- **Control Alien Invasive Vegetation.** Declared alien invasive vegetation within all areas disturbed by site preparation and construction should be controlled at the end of construction, and at annual intervals during operation. Personnel tasked to control alien vegetation should receive appropriate training in the following: methods and control measures; equipment and techniques; types of herbicides and dosages applied; mixing techniques; storage of chemicals and equipment; health and safety issues; plant identification; procedures for equipment washing; equipment maintenance; record keeping, inter alia

If all proposed activities are kept within the clearable areas and mitigation measures are implemented, then this impact is of potentially **low** significance.

7.4.3 Loss of topsoil and soil erosion

One of the potential impacts of clearing and cultivation is the loss of topsoil and sedimentation of the downstream environment. This is due to the clearing of land, which leads to the runoff from the site having a high sediment load. Potential sedimentation is therefore of particular concern.

Description of the environment

The fields are located within a versatile topographical unit. Increased runoff due to agricultural activities would increase the potential loss of soil. The surrounding areas are all vulnerable to erosion if not managed correctly. The proximity of the fields to streams and wetlands, increases the possibility of these streams being silted up if proper stormwater management is not implemented.

Table 21: Loss of topsoil and soil erosion.

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Local	Local
Magnitude	Medium (-)	Low (-)
Duration	Short term	Short term
Significance	Medium (-)	Low (-)
Probability	Probable	Unlikely
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

Where possible, clearing and agricultural activities should be scheduled to occur outside of the rainy period, thereby reducing the volume of runoff during clearing and planting. If this is not possible then extra precaution needs to be taken to reduce this impact. This potential impact is considered to be of **low significance** with mitigation measures implemented.

Mitigation measures

- Outflow from cut-off drains and stormwater diversions should be attenuated sufficiently to prevent erosion of receiving environment.
- Topsoil must be windrowed along the edge of the footprint, including in situ vegetation.
- Adequate stormwater measures must be installed to ensure runoff does not result in erosion and export of soils, particularly topsoil.
- Clearing activities in and around watercourses should be planned for the dry season, to reduce likelihood of sedimentation of same watercourses.
- The contractor must ensure that all vehicles and equipment are in a sound state of repair and do not leak hydrocarbons onto the ground beneath.
- All existing roads must have suitable erosion containment measures in place.
- All residual material must be removed once no longer needed, to ensure they do not inhibit the restoration of ecological function to the area, especially in the buffer zones.

Cumulative impact

One of the potential impacts of clearing and planting is the sedimentation of downstream environments. This is due to the clearing of land, which leads to the runoff from the site having a high sediment load. Potential sedimentation of the tributary is therefore of particular concern.

7.4.4 Ground and Surface water impact

During clearing, planting and the construction of the processing plant, pollutants may find their way into drainage channels and watercourses. Typical sources of pollution include oils and fuels from vehicles.

Description of the environment

Due to the fact that the site is in close proximity of the Houtbosloop, the possible impact of agricultural activities is a reality and should therefore be assessed.

Table 22: Ground and Surface Water Impact

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Local	Local
Magnitude	Medium (-)	Low (-)
Duration	Short term	Short term
Significance	Medium (-)	Low (-)
Probability	Probable	Unlikely
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

Surface and Groundwater pollution can be caused by various activities during the clearing and cultivation phase if not properly managed. These activities include:

- Preparation of fields -
 - Levelling of sites
 - Production of litter from staff
 - Inadequate ablution facilities
 - Construction and operation of storm water management system
 - Increase in surface run-off water due to hardened surfaces.
 - Oil dripping from standing vehicles
 - Spills from servicing or re-fuelling
 - Leaks from stored fuel and oil.

Mitigation measures

- All maintenance and repair work of vehicles will be carried out within an area designated for this purpose, equipped with the necessary pollution containment measures.
- The ground under the servicing and refuelling areas must be protected against pollution caused by spills and/or tank overfills.
- In the event of a breakdown or emergency repair, any accidental spillage must be cleaned up or removed immediately.
- All equipment and machinery must be maintained in good order. Regular checks must be undertaken for leaks, and any found must be immediately repaired.
- The farm manager must ensure that reasonable precautions are taken to prevent the pollution of the ground and water resources on and adjacent to the sites during the clearing and cultivation phase.
- No natural watercourse is to be used for the cleaning of tools or any other apparatus. This includes for purposes of bathing, or the washing of clothes etc. All washing operations will take place at a location where wastewater can be disposed of in an acceptable manner.
- The farm manager must maintain good housekeeping practices that ensure that all work sites are kept tidy and litter free, ensuring no runoff of refuse into surrounding watercourses.
- No spills may be hosed down into the surrounding natural environment. All contaminated soil is to be excavated to the depth of contaminant penetration, placed in 200 litre drums and removed to an appropriate registered landfill site.

- A drainage diversion system is to be installed to divert run-off from areas of potential pollution. Internal storm water reticulation is to be constructed early on in the project in order to significantly reduce the storm water effluent during clearing and planting,
- There should be monitoring and inspection of the site's drainage system to ensure that the water flow is unobstructed.

Cumulative impact

There are no cumulative impacts associated with this impact.

7.4.5 Noise pollution

Description of the environment

The area has a rural agricultural and natural sense of place.

Table 23: Noise Pollution

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Local	Local
Magnitude	Medium (-)	Low (-)
Duration	Short term	Short term
Significance	Medium (-)	Low (-)
Probability	Probable	Unlikely
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

Clearing and agricultural activities, vehicles and personnel on site would cause an increase in noise in the area, which may impact negatively on adjoining landowners and users. This impact is considered of **moderate** significance prior to mitigation and could be reduced to **low**.

Mitigation measures

Impacts of noise generation during clearing, planting and construction in general could be mitigated by ensuring that all regulations relating to noise generation are observed and by restricting work to normal working hours. Further to this the following mitigation measures are of relevance:

- Landowners and neighbours should be informed prior to any activities that are bothersome taking place.
- Notify adjacent landowners of after-hours work and of any other activity that could cause a nuisance.
- No loud music is permitted on site.
- Noise from labourers to be controlled.
- If noise levels at the boundaries of the site exceed 7dB above ambient levels, then the local health authorities are to be informed.
- Respond to community complaints with regard to noise generation, taking reasonable action to eliminate and/or minimise the impact.
- Where complaints cannot be addressed to the satisfaction of all parties, then the farm manager will, upon instruction by the ECO, provide an independent and registered Noise Monitor to undertake a survey of the noise output levels. Recommendations to reduce noise to legislated levels must be implemented.

This potential impact could be readily managed by effective implementation of an EMP.

Cumulative impact

None

7.4.6 Visual Impact – “Sense of Place”

Description of the environment

The clearing and planting of the fields as well as the construction of a processing plant, could have a visual impact on the scenic views and sense of place immediately surrounding the sites.

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, current landuse, etc...) play a significant role.

A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

The most noteworthy aspect contributing to the sense of place of the proposed development area, is the presence of open farmland, undeveloped and natural bush.

Table 24: Visual Impact – “Sense of Place”.

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Local	Local
Magnitude	Medium (-)	Low (-)
Duration	Short term	Short term
Significance	Medium (-)	Low (-)
Probability	Probable	Unlikely
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

The anticipated visual impact of clearing and cultivating (due to the natural surroundings on the property) on the visual character of the landscape is expected to be of **moderate** significance and may be mitigated to **low**.

Mitigation measures

- In terms of screening, all existing vegetation on the periphery of the site is to be maintained as a visual buffer. This should be a minimum of 20 meters.
- This visual buffer zone must systematically have alien species removed and the natural vegetation remaining should be augmented with additional indigenous species.
- In terms of all infrastructure, it is recommended the access road and all structures be planned so that the unnecessary clearing of vegetation is avoided. This implies making use of already disturbed sites rather than pristine areas wherever possible and avoiding large tree specimens and dense established vegetation areas.
- Mitigation of visual impacts associated with the clearing, albeit temporary, entails proper planning, management and rehabilitation. In addition, it is vital that vegetation is not unnecessarily cleared or removed.
- The fields and buildings must be maintained in a neat and visually acceptable state throughout the operational life.

Cumulative impact

There are no cumulative impacts associated with this impact.

7.4.7 Employment opportunities

Description of the environment

There will definitely be a positive economic impact during the clearing and planting phase as temporary employment will be provided through the installation of services as well as the actual clearing, grubbing and planting. There is the potential for local suppliers to also benefit from the proposed activity.

This positive impact will, however, be negated if out-of-town contractors are employed who utilise non-local workers and make use of supplies brought in from other provinces (i.e. Gauteng). If local labour and suppliers are utilised during the construction phase this potential **positive** socio-economic impact will go from a **low to high (+) significance**.

Table 25: Employment opportunities

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Local	Local
Magnitude	Low (+)	Medium (+)
Duration	Short term	Short term
Significance	Low (+)	High (+)
Probability	Probable	Probable
Confidence	Sure	
Reversibility	Reversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Cumulative impact

Not applicable.

7.5 Environmental Management Plan and Environmental Control Officer

As alluded to under Section 6 and 7, all of the aforementioned construction phase impacts could be addressed and minimised by the development and effective implementation of an Environmental Management Programme (EMPr). Accordingly, a draft EMPr for both construction and operational phases will be prepared (see draft report attached as **Appendix F; Annexure A**). Prior to construction, an appropriately qualified environmental consultant should ensure that the draft EMPr be amended to take cognisance of any further requirements included in the RoD. This EMPr should be incorporated into the Civil Tender Document, since this would ensure that:

- The Contractor is made aware of the EMPr “up front”;
- The EMPr is presented in a form and language familiar to the Contractor;
- The Contractor is able to cost for compliance with the EMPr; and
- The EMPr is binding within a well-developed legal framework.

To give appropriate effect to the environmental controls, it is essential that this EMPr be enforced by an appropriately qualified, independent Environmental Control Officer (ECO). The roles and responsibilities of the ECO should include:

- Ensuring that the necessary environmental authorisations and permits have been obtained;
- Monitoring and verifying that the EMPr is adhered to at all times and taking action if the specifications are not followed;
- Monitoring and verifying that environmental impacts are kept to a minimum;
- Reviewing and approving construction method statements with input from the Engineers;
- Assisting the Contractor in finding environmentally responsible solutions to problems;
- Giving a report back on the environmental issues at the monthly site meetings and other meetings that may be called regarding environmental matters;
- Keeping records of all activities/ incidents on Site in the Site Diary concerning the environment;
- Inspecting the site and surrounding areas regularly with regard to compliance with the EMPr;
- Keeping a register of complaints in the Site Office and recording and dealing with any community comments or issues;
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site;
- Ensuring that activities on site comply with other relevant environmental legislation;
- Ordering, via the Engineer’s Representative, the removal of person(s) and/or equipment not complying with the specifications;
- Issuing of fines for contraventions of the EMPr;
- Completing monitoring checklists; and
- Keeping a photographic record of progress on Site from an environmental perspective.

7.6 Operational Phase Impacts

The operational phase impacts are those impacts on the biophysical and socio-economic environment that would occur during the operational phase of the proposed project and are inherently long-term in duration. The operational phase impacts could potentially include:

The bio-physical issues identified include:

- Storm water management

The socio-economic impacts identified include:

- Visual Impact – “Sense of Place”
- Use of pesticides
- Noise

A summary of the operation phase impacts (assessed within the final BAR) is provided below.

Table 26: Operational Phase Impacts

Ref. (Pg)	Description of impact	Significance of Impact	
		Without Mitigation	With Mitigation
Operational Phase Impacts			
72	Stormwater Management	Moderate (-)	Low (-)
73	Visual Impact – “Sense of Place”	Low (-)	Medium (+)
59	Use of pesticides	Medium (-)	Low (-)

7.6.1 Storm water management

Description of the environment

A potential increase in bare soil under trees due to shading will increase the storm water runoff.

Table 27: Storm water management

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Local	Local
Magnitude	Medium (-)	Low (-)
Duration	Short term	Short term
Significance	Moderate (-)	Low (-)
Probability	Probable	Unlikely
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

Erosion and siltation can be caused by stormwater runoff from the site if not properly managed. During the Operational phase, the significance of this impact may be mitigated to **Low** as crops established will provide natural stabilisation of the terrain against erosion. Stormwater infrastructure will be designed to manage runoff.

Mitigation measures

All rainwater drainage points from hardened surface should be designed to reduce water velocity and prevent erosion of wetlands, streams and surrounding natural vegetation, at the point of water entry into the systems.

Topsoil is to be replaced by direct return where feasible (i.e. replaced immediately on the area where planting is complete), rather than stockpiling it for extended periods, and may not be used for building or maintenance of roads.

Erosion protection measures should include, but not be limited to:



- Topsoil must be windrowed along the edge of the footprint, including in situ vegetation.
- Adequate stormwater measures must be installed to ensure runoff does not result in erosion and export of soils, particularly topsoil.
- Clearing activities in and around watercourses should be planned for the dry season, to reduce likelihood of sedimentation of same watercourses.
- The contractor must ensure that all vehicles and equipment are in a sound state of repair and do not leak hydrocarbons onto the ground beneath
- All existing roads must have suitable erosion containment measures in place.
- All residual material must be removed once no longer needed, to ensure they do not inhibit the restoration of ecological function to the area, especially in the buffer zones.

Cumulative impact

None.

7.6.2 Visual impact

Description of the environment

The operation and maintenance of the fields could have a visual impact on the scenic views and sense of place immediately surrounding the sites.

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, current landuse, etc...) play a significant role.

A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

The most noteworthy aspect is the presence of open farmland, undeveloped and natural bush.

Table 28: Visual Impact

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Local	Local
Magnitude	Medium (-)	Low (-)
Duration	Short term	Short term
Significance	Low (-)	Medium (+)
Probability	Probable	Unlikely
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

The anticipated visual impact of maintaining the macadamia trees (due to the natural surroundings on the property) on the visual character of the landscape is expected to be of **low** significance and may be mitigated to **medium positive**.

Mitigation measures

- In terms of screening, all existing vegetation on the periphery of the site is to be maintained as a visual buffer. This should be a minimum of 20 meters.
- This visual buffer zone must systematically have alien species removed and the natural vegetation remaining should be augmented with additional indigenous species.
- In terms of all infrastructure, it is recommended the access road and all structures be planned so that the unnecessary clearing of vegetation is avoided. This implies making use of already disturbed sites rather than pristine areas wherever possible and avoiding large tree specimens and dense established vegetation areas.

- Mitigation of visual impacts associated with the clearing, albeit temporary, entails proper planning, management and rehabilitation. In addition, it is vital that vegetation is not unnecessarily cleared or removed.
- The fields and processing plant must be maintained in a neat and visually acceptable state throughout the operational life.

Cumulative impact

None.

7.6.3 Use of pesticides

Description of the environment

The area in which the proposed activities are to be situated, falls within a Conservation Biodiversity Area and is surrounded by relatively intact vegetation and functional wetlands. This habitat in turn plays host to a plethora of fauna and flora including insects, birds and fish.

Crops must be protected against unwanted consumption by fauna. Possible risk of loss of crops to disease must also be minimised.

It is normal practice to control possible crop damage by utilising pesticides.

Table 29: Use of pesticides.

	Preferred Layout	
	Without mitigation	With mitigation
Extent	Site	Site
Magnitude	Low (-)	Very Low (-)
Duration	Short term	Short term
Significance	Medium (-)	Low (-)
Probability	Possible	Unlikely
Confidence	Sure	
Reversibility	Irreversible	

Significance: positive impacts indicated by no shading & (+), negative impacts indicated by shading & (-)

Impact assessment

Pesticides are widely used to control the growth and proliferation of undesirable organisms that, if left unchecked, would cause significant damage to forests, crops, stored food products, ornamental and landscape plants, and building structures. The use of pesticides in both agricultural and non-agricultural settings provides important benefits to society, contributing to an abundant supply of food and fibre and to the control of a variety of public health hazards and nuisance pests.

Owing to the fact that they are designed to be biologically active, pesticides have potential to cause undesirable side effects. These include adverse effects on workers, consumers, community health and safety, groundwater, surface waters, and non-target wildlife organisms. In addition, pesticide use raises concerns about the persistence and accumulation of pesticides in food chains quite distant from the original point of use, and about the role of certain pesticides in causing reproductive failure and endocrine system abnormalities in both wildlife and humans and other species that are not their intended target. It is, therefore, important to control the use of pesticides, by carefully weighing the benefits that they confer against any possible adverse effects.

The relatively small scale and given that all mitigation measures as indicated below, are implemented it is expected that the significance of this impact will **low**.

Mitigation measures

General Mitigation:

- Chemical control of pests on Uguhleni
- may not take the form of pesticides that pose unmanageable risk such as:
 - Those containing Endocrine Disrupting Properties (EDP),

- Those containing Persistent Organic Pollutants (POPs),
 - Those containing carcinogenic and immunotoxic potential,
 - Those containing formulations classified by WHO as Extremely Hazardous (class 1a) and Highly Hazardous (class 1b), as well as
 - Pesticides associated with frequent and severe poisoning incidents.
- To maintain healthy populations of natural enemies and pollinators, use pesticides sparingly and in accordance with the label and local regulations. Also consider these general guidelines for pesticide applications:
 - Choose selective pesticides.
 - Identify the pest, and use resources available to determine which pesticides will specifically control that pest. Avoid broad-spectrum insecticides such as organophosphates, carbonates, and pyrethroids, which indiscriminately kill everything. Also avoid broad-spectrum herbicides, which reduce floral plants that attract pollinators.
 - Choose nonpersistent pesticides.
 - Some pesticides leave residues that kill natural enemies and pollinators long after the initial application (residual toxicity); in addition to immediately killing them (contact toxicity).
 - Choose less harmful formulations.
 - Generally, dusts, powders, and microencapsulated pesticides are the most harmful to honeybees, and aerial spraying is the most hazardous method of application. Liquid solutions and granules are the least detrimental to pollinators.
 - Spot-treat
 - Targeting your application to specific areas where the pest is a problem will reduce the harm to natural enemies and pollinators.
 - Time applications
 - To protect pollinators and other fauna, avoid spraying when flowers are in bloom. Apply pesticides during the evening or early morning when pollinators are less active. Do not apply when temperatures will be especially low or when dew is expected. Risk of pesticide toxicity is prolonged under these conditions since residues remain on plants longer.
 - Consider water management practices that reduce pesticide movement off-site.
 - Consult relevant publications.
 - Consider practices that reduce air quality problems:
 - When possible, reduce volatile organic compound (VOC) emissions by decreasing the amount of pesticide applied, choosing low-emission management methods, and avoiding emulsifiable concentrate (EC) formulations.
 - Protection of water quality:
 - Include instituting buffer zones, restricting aerial spraying in a certain proximity to surface water bodies.
 - Food Safety:
 - Ensure that pesticides are properly labelled, and the producers apply those pesticides in accordance with the label. To ensure compliance with relevant legislation.
 - Worker Protection:
 - The Occupational Health and Safety Act (OHSA). 1993 (Act No. 85 of 1993) regulates health and safety at the workplace for all workers. This Act places the onus on employers to maintain a safe workplace. The regulation makes provision for various mandatory safety measures to protect the health of workers handling hazardous chemicals, such as risk assessment, safety training, safe practices and medical, biological and environmental monitoring of all workplaces.
 - Pesticide disposal and container management
 - South Africa has enacted several laws in an attempt to ensure that toxic wastes are disposed of without becoming a danger to people or the environment. This legislation includes the Hazardous Substance Act, 1973 (Act No. 15 of 1973), the Environmental Conservation Act. 1989 (Act 73 of 1989), the Atmospheric

Pollution Prevention Act, 1965 (Act No. 45 of 1965), and the National Environmental Management Act, 1998 (Act 107 of 1998).

Specific Mitigation:

- Before an application:
 - Ensure that spray equipment is properly calibrated to deliver the desired pesticide amount for optimal coverage.
 - Use appropriate spray nozzles and pressure to minimize off-site movement of pesticides.
 - Avoid spraying during these conditions:
 - Wind speed over 8 km/h
 - Temperature inversions
 - Just prior to rain or irrigation (unless it is specifically recommended, as when incorporating a soil-applied pesticide)
 - At tractor speeds over 3 km/h
 - Identify and take special care to protect sensitive areas (for example, waterways or riparian areas) surrounding your application site.
 - Review and follow labelling for pesticide handling, personal protection equipment (PPE) requirements, storage, and disposal guidelines.
 - Check and follow restricted-entry intervals (REI) and preharvest intervals (PHI).
- After an application:
 - Record application date, product used, rate, and location of application.
 - Follow up to confirm that treatment was effective.

Cumulative impact

The increase in the number of areas planted to macadamia or any other crop and the necessity to control pests that affect the success of these crops, could lead to the increased utilisation of pesticides. This in turn could lead to possible negative impacts on the fauna surrounding the fields. However, the wise and judicious use of chemicals to control pests as well as the implementation of mitigatory measures listed above would reduce the significance of this impact to **LOW**.

7.7 Final Conclusions and Recommendations

The essence of all EIA processes is aimed at ensuring informed decision-making and environmental accountability. Furthermore, it assists in achieving environmentally sound and sustainable development. In terms of NEMA (No 107 of 1998), the commitment to sustainable development is evident in the provision that “development must be socially, environmentally and economically sustainable and requires the consideration of all relevant factors. In addition, the preventative principle is required to be applied, i.e. that the disturbance of ecosystems and loss of biological diversity are to be “...avoided, or ... minimised and remedied” and “disturbance of the landscape and the nation’s cultural heritage is avoided and where it cannot be altogether avoided is minimised and remedied”. Therefore, negative impacts on the environment and on people’s environmental rights in terms of the Constitution (Act 108 of 1996)) should be anticipated and prevented, and where they cannot be altogether prevented, they must be minimised and remedied in terms of “reasonable measures”. “Reasonable measures” implies that “every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law and cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment”.

7.7.1 Conclusions

The preceding chapters provide a detailed assessment of the anticipated environmental impacts on specific components of the biophysical and social environments associated with the proposed development and operation of the processing plant and macadamia plantation. This FBAR has provided a comprehensive assessment of the potential environmental impacts, identified by the EIA team and I&AP’s, associated with the proposed project. **This investigation has not identified any potential impacts on the biophysical or social environments that are so severe as to suggest that the proposed activity should not proceed.** The design has taken cognisance of the various

environmental considerations and accordingly, incorporates remedial measures aimed at curtailing the significance of the potential negative environmental impacts associated with the proposed development, as well as enhancing the potential positive environmental (including Socio-economic) impacts.

The significance of the potential environmental (biophysical and social) impacts associated with the proposed macadamia plantation are summarised in Table 30.

It should be noted that the impacts have been assessed with a reasonable amount of confidence, i.e. in terms of the defined confidence ratings presented in Table 15.

From Table 30 it is apparent that there is **no** long term or operational phase impacts of significant concern. The negative impacts associated with the operational phase are likely to be of **medium** to **low** significance, particularly if the proposed mitigation measures are implemented. Moreover, there are a number of potential positive impacts associated with the proposed development, viz., the creation of positive construction and operational phase impacts on employment.

With regards to the short term or construction phase impacts, the significance of the construction phase impacts are likely to be curtailed by the relatively short duration of the construction phase. Moreover, many of the construction phase impacts could be mitigated by the effective implementation of the mitigation measures outlined above. If these measures were put into practice the significance of all construction phase impacts would be reduced to **low**. While the probability of the construction phase impacts occurring is relatively high without mitigation, the effective implementation of the mitigation measures will reduce the probability of the impacts occurring.

Table 30: Summary of the significance and probability of the potential positive and negative impacts associated with the proposed development.

Ref. (Pg)	Description of impact	Significance of Impact	
		Without Mitigation	With Mitigation
Construction Phase Impacts			
60	Fauna and Flora	Medium (-)	Low (-)
62	Aquatic Ecosystems	Medium (-)	Low (-)
Error! Bookmark not defined.	Historical	Low (-)	Low (-)
66	Loss of Topsoil and Soil Erosion (Hydrological)	Medium (-)	Low (-)
67	Ground and Surface Water Impact	Medium (-)	Low (-)
68	Noise Pollution	Medium (-)	Low (-)
69	Visual Impact	Medium (-)	Low (-)
70	Employment Opportunities	Low (+)	High (+)

Ref. (Pg)	Description of impact	Significance of Impact	
		Without Mitigation	With Mitigation
Operational Phase Impacts			
72	Stormwater Management	Moderate (-)	Low (-)
73	Visual Impact – “Sense of Place”	Low (-)	Medium (+)
59	Use of pesticides	Medium (-)	Low (-)

It is felt that the proposed macadamia orchard will have no detrimental negative impact on the environment and should the necessary mitigation measures be implemented there are no impacts envisaged of high significance or any fatal flaws.

In this regard, the EAP sees no reason as to why the proposed activity may not be authorised.

7.7.2 Recommendations and Environmental Impact Statement

Should the proposed activity be authorised, the most important mitigation measures, which should be stipulated as requirements in any authorisation include the following:

- The Construction Phase EMPr that addresses, inter alia, the issues discussed under Construction Phase impacts, viz. Ecological sensitivity, erosion and sedimentation, deterioration of water quality, heritage impact, noise disturbance and socio-economic impacts, traffic, windblown dust, litter/waste and safety should be effectively implemented for the duration of the project.
- A suitably qualified professional should be appointed to act as the ECO and oversee the implementation of the EMPr during construction.
- It is suggested that all new agricultural developments be restricted to the areas formerly cultivated and that a 30 m conservation buffer be implemented around the edge of all riparian areas and drainage lines.
- The placing of all proposed agricultural lands within the Secondary Woodland and exclusion of all other vegetation communities from development is suggested.
- An independent Environmental Compliance Officer must be appointed to monitor compliance with the RoD during all phases of construction; and
- Bulk clearing of vegetation should be restricted to the dry months between April and September to reduce erosion and subsequent sedimentation.
- All existing and proposed roads should contain adequate stormwater drainage and erosion control measures.
- In order to comply with the National Environmental Management: Biodiversity Act (Act No. 10 OF 2004), all listed invasive exotic plants as indicated in Appendix 1 of the terrestrial ecology report should be targeted and controlled. This may necessitate the compilation of an alien plant control plan as at least eight declared invasive species were recorded during fieldwork.
- Weeds will inevitably establish around the proposed agricultural lands, and it is important that weed control, if involving herbicides, be managed correctly so as to reduce the impact on the adjacent natural vegetation. Regular inspections should be made to determine if any additional alien plants have established.
- If any human remains are discovered during earth moving activities, excavations must stop at the location of these findings, and these must be treated with respect. The South African Heritage Resources Agency must be notified immediately. An archaeologist may be required to remove the remains at the expense of the developer.
- Effective design of all stormwater outlet areas to prevent erosion and flooding at the point of discharge and immediately downstream.
- Appropriate landscaping and rehabilitation of indigenous vegetation should be included in the development of the site.
- Construction should be planned so that the unnecessary clearing of vegetation is avoided.
- Measures are taken to ensure that personnel and the general public are safe at all times.

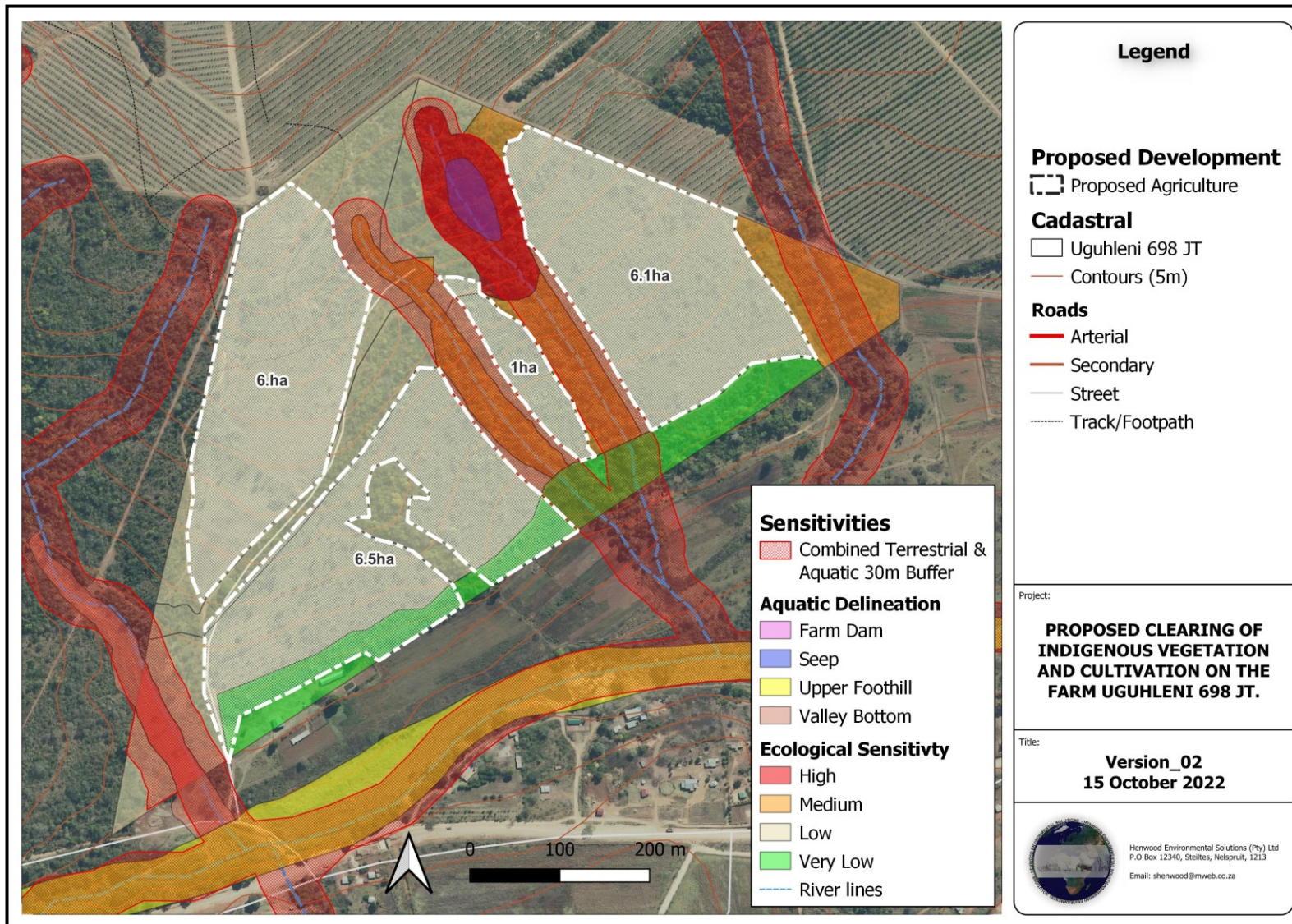


Figure 9: Sensitivity Map



8 The way forward

The competent environmental authority (i.e. DARDLEA) will review the final BAR and decide whether or not to grant authorisation.

Once DARDLEA has reviewed the Final BAR they will either issue a Record of Decision based on the information contained in the Final BAR or indicate that further information is required in order to make an informed decision with regard to the proposed activities. If a Record of Decision is issued, this would be communicated by means of letters to all identified I&AP's. Following the issuing of the Record of Decision, there will be a 10-day notice of intent to appeal period, followed by a 30-day appeal period within which I&AP's will have an opportunity to appeal against DARDLEA's decision to the Provincial MEC for Environmental Affairs and Development Planning in terms of the National Environmental Management Act.

9 References

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VAN AARDT CP (2022) Barberton Valley Plantations Soils Report

10 Assumptions, Uncertainties and Gaps in Knowledge

In undertaking this investigation and compiling the EIA Report, the following has been assumed:

- The information provided by the applicant is accurate and unbiased.
- The scope of this investigation is limited to assessing the environmental impacts associated with the proposed development and associated infrastructure.

11 Representations and Comments

NO ISSUES HAVE BEEN RAISED TO DATE,

12 Specific Information

To date no other specific information was required by the Mpumalanga Department of Economic Development, Environment and Tourism.

13 Matters Required in terms of sections 24(4)(a) and (b) of the Act.

None

SECTION F: APPENDICES**APPENDIX A: SITE PLAN(S)**

- Annexure A: Locality Map
- Annexure B: Preferred layout including onsite sensitivities.

APPENDIX B: SITE PHOTOGRAPHS

- Annexure A: Site photos

APPENDIX C: FACILITY ILLUSTRATION(S)**APPENDIX D: SPECIALIST REPORTS**

- Annexure A: Wetland Delineation and Risk Assessment
- Annexure B: Ecological Sensitivity Assessment
- Annexure D: Historical Impact Assessment
- Annexure E: Palaeontological Report
- Annexure F: Soils

APPENDIX E: PUBLIC PARTICIPATION PROCESS

- Annexure A: Site notice text
- Annexure B: Proof of displayed notice boards
- Annexure C: Background Information Document (BID) text
- Annexure D: Proof of given Background Information Document (BID) and Draft BAR- distributed via email and by hand.
- Annexure E: Advertisement text
- Annexure F: Proof of placed advertisement
- Annexure G: Letter of notification of EIA
- Annexure H: Proof of given Letter of notification
- Annexure I: List of registered Interested and Affected Parties (I&AP's)
- Annexure J: Comments and responses

APPENDIX F: OTHER

- Annexure A: Draft Environmental Management Programme
- Annexure C: Curriculum Vitae of EAP
- Annexure D: Declaration by EAP.
- Annexure E: Water Use