

Environmental Management Programme

BOBLANDS AVOCADOS

NOVEMBER 2017

MDARDLEA Ref: 1/3/1/16/1 E -108

Notice no. R 983, 2014: Activity 27.

Notice no. R 984, 2014: Activity 15.



**ENPACT ENVIRONMENTAL
CONSULTANTS CC**

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PROJECT DETAILS	
TITLE	Boblands Avocados
REPORT STATUS:	Environmental Management Programme
LOCATION:	A Portion of Portion 1 of the farm Boblands 247 JU and Portion 3 of the farm Weltevreden 229 JU, Mara Valley, Mpumalanga
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PROGRAMME PREPARED FOR SUBMISSION TO:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs: DARDLEA Ehlanzeni District Offices The Directorate: Environmental Impact Management 18 Jones Street Nelspruit, 1200
DATE OF COMPILATION:	NOVEMBER 2017
ACTIVITIES APPLIED FOR:	Notice no. R 983, 2014: Activity 27. Notice no. R 984, 2014: Activity 15.
MDARDLEA REFERENCE NUMBER:	1/3/1/16/1 E - 108

EAP EXPERTISE	
Maryke André	Maryke André is employed by Enpact Environmental Consultants CC and has 10 years' experience in the EIA consulting industry with this company. Qualifications include a Btech Nature Conservation degree. Experience in Environmental Impact Assessments spans a wide range of projects including residential and business developments, tourism developments, infrastructure projects (roads, water, sewer and renewable power generation), concentrate farming and waste management facilities. She also deals extensively with the compilation of waste management and water use licence applications.
Heinrich Kammeyer	Heinrich Kammeyer is the owner of Enpact Environmental Consultants CC. Qualifications include a degree in Chemical Engineering, MBL and Masters Environmental Engineering (Cum laude). The Environmental Consulting Business which was started in 2004 has completed more than 150 Environmental Impact Assessment Applications to date. Experience in Environmental Impact Assessments, over the past 10 years, spans a wide range including residential and business developments, tourism developments, roads, water and sewer, renewable power generation, concentrate farming and waste management facilities. In addition he also has extensive experience in waste management licences as well as water use licence applications.

Table of content

1. INTRODUCTION..... 6
 2. PROJECT OVERVIEW 6
 3. LEGAL REQUIREMENTS 8
 4. ENVIRONMENTAL MANAGEMENT AND RESPONSIBILITIES 9
 5. ENVIRONMENTAL AWARENESS PLAN AND TRAINING 10
 6. REPORTING AND RECORD KEEPING 11
 7. PROJECT ACTIVITIES AND MANAGEMENT STATEMENTS 12
 8. MANAGEMENT OBJECTIVES..... 16
 9. MANAGEMENT OUTCOMES..... 16
 10. PROJECT-SPECIFIC CONDITIONS 16

List of tables

Table 1: Typical roles and responsibilities 9
 Table 2: Typical task table..... 11
 Table 3: Summary of the activities, aspects and impacts/risks that need to be avoided and/or mitigated for the clearing activities 13
 Table 4: Impact Significance summary identifying the impacts and risks that need to be avoided and/or mitigated..... 14

Appendixes:	
Appendix 1:	Site plan
Appendix 2:	Environmental Authorisation

Abbreviations:	
EA:	Environmental Authorisation
EIA:	Environmental Impact Assessment
ECO:	Environmental Control Officer
EMPr:	Environmental Management Programme
MDARDLEA:	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
NEMA:	National Environmental Management Act

Definitions:

Environmental Management Programme (EMPr): An EMPr is an environmental action plan or tool used to ensure that undue or reasonably avoidable adverse impacts of an activity are prevented, and that positive impacts are enhanced. It thus addresses the how, when, who, where and what of integrating environmental mitigation and monitoring measures through the project development activities.

Alien Vegetation: alien vegetation is defined as undesirable plant growth which will include, but not be limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA), 1983 regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Environment: environment means the surroundings within which humans exist and that could be made up of the following:

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Aspect: an environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Impact: an impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction or implementing activity. An impact may be the direct or indirect consequence of a construction/implemented activity.

Environmental Authorisation: an environmental authorisation is a written statement from the Department of Agriculture, Rural Development, Land and Environmental Affairs, (MDARDLEA), which records its approval of a planned activity and the conditions of approval which may include mitigating measures required to prevent or reduce the effects of environmental impacts during the life of an activity.

Watercourse: means –

- (a) river or spring;
- (b) a natural channel in which water flows regularly or intermittently;
- (c) a wetland, pan or lake or dam into which , or from which water flows; and any collection of water which the Minister ay, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998)

Environmental Management Programme BOBLANDS AVOCADOS

1. INTRODUCTION

Enpact Environmental Consultants CC was appointed by the applicant to compile the Environmental Management Programme (EMPr) as part of the Environmental Impact Assessment Report for the removal of indigenous vegetation for the cultivation of avocados on an approximately 29,5 ha area. This EMPr complies with the requirements in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the 2014 EIA Regulations (amended).

The Environmental Management Programme prescribes and directs the management of all environmental aspects, physical, natural and/social associated with and arising from the activities that meets the thresholds of activities listed under the EIA Regulations.

This Environmental Management Programme sets out the methods and guidance by which proper environmental controls are to be implemented to minimise and remediate environmental damage.

The EMPr must be read as a whole and complete document. The provisions of this EMPr are binding on the Holder of the Authorisation and/or Contractor during the life of the contract. The EMPr must be read in conjunction with the conditions of the Environmental Authorisation for the specific project. In the event that any conflict occurs between the terms of the EMPr and the project specifications or environmental authorisation, the terms herein shall be subordinate.

The EMPr identifies the following:

- Construction activities that will impact on the environment.
- Relevant parties and their responsibilities
- Specifications with which the Holder of the authorisation/Contractor shall comply in order to protect the environment from the identified impacts.
- Actions that shall be taken in the event of non-compliances.

2. PROJECT OVERVIEW

It is proposed to clear three areas of 29,5 hectares in total for the purposes of avocado cultivation.

Site 1 (5.8 ha), Site 2 (13.2 ha) and Site 3 (10.5 ha) is located adjacent east to the Blinkwaterspruit. Refer attached map.

The regulations require that where an area of larger than 1 hectare is to be cleared of indigenous vegetation, environmental authorisation must first be obtained.

Indigenous vegetation is defined as vegetation that consists of indigenous species occurring naturally in the area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.

Two of the three areas were cultivated more than ten years ago and the re-established vegetation is now classified as indigenous. The footprint of earlier activities is still evident and the boundaries up to where cultivation took place are easy to determine.

Irrigation water will be released from a dam located in one of the main tributaries of the Blinkwaterspruit on Paradors Game Ranch which is the applicant's property that is located

further south of the proposed sites. Water will be released down the Blinkwaterspruit to where it will be abstracted from the existing dam adjacent south of the sites. Refer to figure 2 below.

Each site will be described and discussed separately in the EIR. A specialist assessed the terrestrial ecology of the site to determine the present ecological state of the area.

The gravel road providing access to Paradors Game Ranch and other farms in the area from the Mara turn-off on the N4 highway also provides access to the proposed sites. One site is located adjacent west of the gravel road and the other two adjacent east of the road. There are some internal roads on the sites that will be used for the operation and management purposes of the planned orchards.

In preparation for the planting of the avocado trees, the natural tree cover, other woody vegetation and grass cover will be removed from the sites. The lines in which the trees are to be planted will be deep ripped and berms will be created. The trees will be planted on top of the berms and the required irrigation system will be put in place. The applicant will use micro irrigation.

Any contours still on the site will stay in place to curb erosion but the trees will be planted in a north-south direction. Ground cover will be spread into the areas between the tree lines to encourage growth and to protect the soil.

The sites will be fenced appropriately to protect the crops. A maintenance road will also be allowed for next to and on the outside of the fence line.

Refer to the authorised site map indicating the different areas applied for.

Various potential environmental aspects and impacts have been identified and considered in the EIA Report to be submitted to MDARDLEA in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

The following table sums up the activities applied for:

Listing notice activity	Activity description
R.983, 2014: Activity 27 - 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) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	It is proposed to clear three sections of indigenous vegetation for the purposes of cultivation at S25° 35' 25.09" E31° 8'30.52"
R.984, 2014: Activity 15 - The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	It is proposed to clear an area of 29,5 hectares of indigenous vegetation for the purposes of cultivation at S25° 35' 25.09" E31° 8'30.52"

The EMP as a guideline document sets out what needs to be considered to mitigate identified potential impacts and describes how this could be achieved. It is therefore not a specification of exact methods. The document provides a basis for managing, mitigating and monitoring the environmental impacts associated with all phases of the project in terms of NEMA, 1998 (Act No. 107 of 1998).

3. LEGAL REQUIREMENTS

Clearing and related activities must be according to the best industry practices, as identified in the project documents. This EMPr, which forms an integral part of the project documents, informs the Holder of the Authorisation and whoever is appointed as to his/their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by activities associated with the project.

The Holder of the Authorisation should note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document legally contradict those specified in the standard or project specifications then the latter shall prevail.

Statutory and other applicable legislation

The Holder of the Authorisation is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

Major environmental legislation includes but is not limited to the following:

The Constitution, 1996 (Act No. 108 of 1996), which states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected through reasonable legislative and other measures to prevent pollution and ecological degradation; promote conservation and ensure ecologically sustainable development and use of natural resources.

The National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), which provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and provide for matters connected therewith. The most recent Environmental Impact Assessment Regulations that were promulgated in terms of this Act was in 2010.

Environmental Regulations in Terms of Chapter 5 of NEMA, 1998, Regulations R982, R983 and R984 of 2014 describing the procedures and criteria for the submission, processing and consideration and decision of applications for environmental authorisation for activities and for matters pertaining thereto.

National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) makes provisions to accomplish the objectives of the United Nations' Convention on Biological Diversity.

The Environment Conservation Act, 1989 (Act No. 73 of 1989) provides for the effective protection and controlled utilisation of the environment and for matters incidental thereto.

The Conservation of Agricultural Resources Act (CARA), 1983 (Act No. 43 of 1983) provides for control over the utilisation of the natural agricultural resources of South Africa in order to promote the conservation of soil, water sources and vegetation, as well as combating weeds and invader plants.

The Mpumalanga Conservation Act, 1998 (Act No. 10 of 1998), consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith.

National Water Act, 1998 (Act No. 36 of 1998), makes provision for the protection of surface water and groundwater and their sustainable management for the prevention and remediation of the effects of pollution, as well as for the management of emergency situations.

National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998), the purpose of this Act is to prevent and combat veld, forest and mountain fires. The applicant must be aware of the duty on owners to prepare and maintain firebreaks irrelevant of the applied for activities or the proposed land use.

Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), aims to provide for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work and to establish an advisory council for occupational health and safety.

Promotion of Access to Information Act (Act No. 2 of 2000), to give effect to the constitutional right of access to any information held by the state and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith.

4. ENVIRONMENTAL MANAGEMENT AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement and cooperation of all the role players involved in the project. Each will fulfil different but important roles as outlined in this document to ensure sound environmental management during the project specifically the construction phase.

This EMPr includes conditions that must be specifically monitored and/or implemented by the following role players:

Table 1: Typical roles and responsibilities

Roles/Party	Responsibility
Competent Authority	The Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) is the designated authority responsible for authorising and enforcing the EMPr.
Holder of the Authorisation	The Holder of the Authorisation is ultimately responsible for compliance with the conditions as set out in the approved EMPr and authorisation in order to comply with environmental legislation. Duties include: a) Responsible for compliance with the provisions of the Duty of Care and Rehabilitation of Environmental Damage contained in Section 28 of the NEMA; b) Ensuring that the necessary environmental authorisations and permits have been obtained; c) Finding environmentally responsible solutions to activity related environmental problems and following all guidelines as set out in the EMPr; d) Issuing instructions to the farm manager where environmental considerations call for action to be taken; e) Instituting action against transgressions i.e. instituting a fine system, including ordering the removal of person(s) and/or equipment not complying with the EMPr specifications.
Environmental Control Officer (ECO)	An independent appointment by the Holder of the Authorisation to objectively monitor/audit the implementation of the EMPr and the conditions of the authorisation for a particular project during the construction period/specified period through audits conducted at a specified frequency. The ECO must remain employed until all rehabilitation measures as well as the site clean-up is completed and

Roles/Party	Responsibility
	<p>the site is handed over to the Holder of the Authorisation for operation. The ECO must have the necessary expertise or access to specialist input as may be required for the size and environmental sensitivity of a particular project, and shall give recommendations and communicate effectively with the other role-players.</p> <p>Duties of the ECO includes:</p> <ol style="list-style-type: none"> a) Keep a copy of the Environmental Authorisation and all applicable permits, licences on site. b) Establish an effective environmental control program and routine management, liaison and reporting systems and prepare management reports. c) Audit the site at least once a month or on a frequency as specified in the authorisation. Reports must be made available on request to Interested and Affected Parties and as specified in the Authorisation to the MDARDLEA. d) Advise the Holder of the Authorisation/Contractor on environmental issues or incidents during implementation of the EMPr and advise them of actions required. The results are to be included in the monthly report. e) Ensure continuous auditing of the activities during all phases for adherence to the EMPr. f) Identify problem areas and provide action plans to avoid further environmental damage. g) Review the Contractor's proposals for pollution control measures and advise on their adequacy. h) Ensure that any significant environmental incidents are reported to the MDARDLEA. i) Keep a site dairy (record complaints received on site and resolutions thereto, non-compliances as well as instructions) and copies of all environmental reports submitted to the MDARDLEA. Complaints shall be investigated within 24 hours, corrective action implemented and feedback should be give to the complainant on the remedial action taken. j) Ensure that open communication lines exist to receive and resolve any problems or complaints from the public.

Specific implementation and monitoring roles are highlighted in the environmental mitigation table.

5. ENVIRONMENTAL AWARENESS PLAN AND TRAINING

The Holder of the Authorisation/Contractor shall ensure that adequate environmental training takes place. All employees must have been given an induction presentation on environmental awareness to understand the obligations in terms of the EMPr.

Where possible, the presentation needs to be conducted in the language of the employees.

The Environmental Control Officer must with the contractor put together a plan that aims to:

- ❖ Inform all the staff of the environment they will work in and the sensitivity with regards of certain areas and/or aspects;
- ❖ Explain certain aspects and the general measures that should be implemented in order to meet the requirements of the EA and EMPr.
- ❖ Training must be recorded and an attendance register kept.

6. REPORTING AND RECORD KEEPING

The Holder of the Authorisation must programme his work in such a way that the cause and effect of the authorised activity is identified and the activity planned so as to prevent any impact from happening.

If prevention is not practicable, or in the event of accidents or misapplications, the Holder of the Authorisation/Farm manager shall provide plans and measures, which will limit the magnitude, duration and intensity of the impact.

The ECO shall review the environmental management performance of the Holder of the Authorisation/Farm Manager on a regular basis. The party shall be deemed not to have complied with the EMPr if:

- There is evidence of the contravention of any of the conditions of the EMPr.
- The person fails to comply with corrective or other instructions by the Environmental Control Officer.
- The person fails to respond to complaints from the public.
- The staff is found removing vegetation, entering neighbouring areas or cause disturbances due to unacceptable behaviour.

The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions.

The Holder of the Authorisation/Farm Manager shall advise the ECO of any emergencies on Site, together with a record of action taken, within 24 hours of the emergency occurring. Such emergency shall be reported to the holder of the EA.

Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority. The responsible provincial or national authorities shall ensure compliance and impose penalties relevant to the transgression as allowed for within its statutory powers.

Table 2: Typical task table

Responsible party	Task	Frequency
Holder of Authorisation/Farm Manager	Visual Inspections	Daily
Environmental Control Officer	Site Inspections and Compliance Audits	Monthly
	Environmental Audit Reports	Monthly or as prescribed by the EA

7. PROJECT ACTIVITIES AND MANAGEMENT STATEMENTS

The EMPr mainly addresses the planning and clearing of the site and general aspects of operation.

General measures are prescribed for the activities, which will entail that some potentially occurring impacts are minimised or prevented.

This project/activity does not have any decommissioning or closure aspects. Some general measures have been included with regards to the farming of the areas that are to be cleared.

The following activities are anticipated and associated with the clearing of the vegetation:

Preparation for clearing

Setting out of the site/s:

- The area/s that must be cleared need to be set out.
- The applicable buffer zones must be marked out and no activities other than alien plant removal are allowed in these areas.

Site clearance:

- The trees and other woody vegetation will be removed from the entire site. See note to keep the Fig tree on Site 2.
- The sites will be ripped.
- Cultivar trees are normally planted in a north-south facing direction where the contours allow it. Small berms will be created on which the trees are then planted.
- Where the natural contours cannot be followed when the tree lines are created, contour walls to kerb erosion are made accordingly.

Table 3: Summary of the activities, aspects and impacts/risks that need to be avoided and/or mitigated for the clearing activities

Activities and management aspects		Aspects	Potential impacts
1.	Planning <ul style="list-style-type: none"> • Demarcation of areas to be cleared 	<ul style="list-style-type: none"> ➤ Site demarcation 	<ul style="list-style-type: none"> ➤ Loss of and disturbance ground cover, indigenous vegetation and creation of hard surfaces ➤ Loss of conservation important species (terrestrial and aquatic) ➤ Loss of topsoil and soil conditions
2.	Site clearance <ul style="list-style-type: none"> • Clearance of vegetation from demarcated areas 	<ul style="list-style-type: none"> ➤ Vegetation loss ➤ Removal of groundcover ➤ Disturbance of soils ➤ Disturbance of riparian vegetation ➤ Creation of hard surfaces ➤ Air emissions (Dust) ➤ Generation of waste (removed vegetation) 	<ul style="list-style-type: none"> ➤ Loss of ground cover and vegetation ➤ Loss of conservation important fauna/flora ➤ Impoverishment/degrading/fragmentation of terrestrial and aquatic habitat and environment ➤ Surface and ground water pollution ➤ Air pollution
3.	Fauna and flora management <ul style="list-style-type: none"> • Removal of terrestrial vegetation and potentially fauna • Removal of vegetation on stream banks and in-stream as well as from riparian areas (alien plant control) • Alien vegetation eradication and control 	<ul style="list-style-type: none"> ➤ Removal of vegetation ➤ Removal of protected fauna and flora ➤ Earthworks where activities occur close to watercourses ➤ Alien vegetation eradication and control 	<ul style="list-style-type: none"> ➤ Fragmentation and loss of habitat ➤ Loss of conservation important species ➤ Loss of fauna & flora and onsite biodiversity ➤ Degradation of terrestrial and aquatic ecosystems ➤ Increase in the invasion of alien vegetation
4.	Soil management <ul style="list-style-type: none"> • Soil disturbance • Excavations and moving of soil • Creation of soil berms for planting and stormwater management 	<ul style="list-style-type: none"> ➤ Exposing of soil surfaces ➤ Creation of unstable or unprotected soil surfaces ➤ Creation of hard surfaces 	<ul style="list-style-type: none"> ➤ Loss of topsoil ➤ Soil pollution ➤ Erosion and siltation ➤ Surface water pollution
5.	Water management <ul style="list-style-type: none"> • On site surface and storm water management • Irrigation system planning and installation • Use of surface water for irrigation 	<ul style="list-style-type: none"> ➤ Earthworks close to water resources and buffer zones ➤ Discharge of storm water into receiving environment ➤ Erosion protection measures ➤ Pollution control measures 	<ul style="list-style-type: none"> ➤ Surface water pollution (quality) ➤ Loss of surface water quantity ➤ Loss of aquatic fauna and flora ➤ Impacts on downstream receiving environment ➤ Changes to morphology, hydrology, flow,

Activities and management aspects		Aspects	Potential impacts
		➤ Water requirements of orchards, planning and setting up of irrigation strategy	<ul style="list-style-type: none"> ➤ biota of onsite drainage lines ➤ Erosion of cleared areas and sedimentation into receiving environment
6.	Air quality <ul style="list-style-type: none"> • Vegetation clearing activities • Soil excavations and movement 	➤ Dust emissions	➤ Air pollution
7.	Waste management <ul style="list-style-type: none"> • Removal of ground cover and vegetation • Construction/farm workers creating domestic waste 	<ul style="list-style-type: none"> ➤ Handling of removed vegetation and ground cover ➤ Handling of domestic wastes 	<ul style="list-style-type: none"> ➤ Air pollution ➤ Impoverishment and sedimentation of surface water resources ➤ Soil pollution
8.	Alien plant control and stabilisation of site/s <ul style="list-style-type: none"> • Alien plant control • Erosion and sedimentation control • Rehabilitation of areas that will not be planted 	<ul style="list-style-type: none"> ➤ Removal of alien plant vegetation ➤ Stabilising of unprotected soil surfaces 	<ul style="list-style-type: none"> ➤ Negative impacts on receiving environment ➤ Loss of topsoil ➤ Surface water pollution ➤ Erosion and sedimentation

Table 4: Impact Significance summary identifying the impacts and risks that need to be avoided and/or mitigated

IMPACT ASSESSMENT TABLE – Clearing of vegetation							
Impact description	Period	Extent	Duration	Intensity	Probability	Significance pre- mitigation	Significance post mitigation
Air (dust) pollution	Clearing	Local	Short	Low	Probable	Low	Low
Loss of topsoil	Planning	Site	Medium	Medium	Probable	Medium	Low
Erosion and sedimentation	Clearing	Local	Medium	Medium	Probable	Medium	Low
Erosion and sedimentation	After clearing	Local	Medium	Medium	High	Medium	Low
Surface water pollution - erosion	Clearing	Local	Short	Medium	Probable	Medium	Low
Loss of aquatic habitat and invasion of alien plants	Clearing and after	Local	Medium	Medium	Unlikely	Medium	Low
Degradation of drainage lines	Clearing and after	Local	Medium	Medium	Unlikely	Medium	Low
Demands on surface water resources and water quantity	Operation	Local	Medium	Medium	Probable	High	Low
Surface water pollution	Operation	Local	Medium	Medium	Probable	High	Low
Loss of indigenous vegetation from the sites	Clearing	Site	Permanent	Low	Definitely	Medium	Medium
Loss of important or sensitive habitat	Planning and clearing	Regional	Permanent	Medium	Unlikely	Medium	Low
Loss of conservation important flora & fauna from the sites	Planning and clearing	Site	Permanent	Medium	Probable	Low	Low

IMPACT ASSESSMENT TABLE – Clearing of vegetation							
Impact description	Period	Extent	Duration	Intensity	Probability	Significance pre- mitigation	Significance post mitigation
Loss of habitat suitable for fauna	Planning and clearing	Site	Permanent	Low	Probable	Medium	Low
Change, fragmentation or loss of habitat and connectivity	Clearing	Local	Permanent	Low	Unlikely	Low	Low
Invasion of weeds and alien vegetation	Clearing and operation	Site	Long	High	Probable	Medium	Low
Loss of fauna – pest control	Planning and clearing	Site	Permanent	Low	Probable	Medium	Medium
Visual impact	Clearing	Local	Short	Low	Definite	Medium	Low
Visual impact	Operation	Local	Long	Low	Probable	Medium to Low	Low
Noise impact on surrounds	Clearing	Local	Short	Medium	Probable	Low	Very Low
Noise on surrounding area	Operation	Local	Long	Medium	Probable	Medium	Low
Increase of traffic volumes	Clearing	Local	Short	Medium	Probable	Very Low	Very Low
Socio-economic impact (+)	Clearing	Local	Short	Medium	High	High	High (+)
Social impact (-)	Clearing	Local	Long	Medium	High	Medium	Low

8. MANAGEMENT OBJECTIVES

The objectives of the EMPr and the mitigation measure proposed to be implemented are to ensure that the biophysical and social environments receive due consideration during the planning period and the clearing of vegetation. It will also outline guidelines for the sound management of environmental issues during the clearing of the indigenous onsite vegetation but also to a degree operational issues as raised by interested and affected parties.

Some activities associated with the project needs to be subjected to certain conditions to become environmentally acceptable.

This document provides detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment. The measures prescribed aims to result in a cautious approach being applied to on-site environmental management to ensure prevention, minimising and remediation of potential impacts.

Furthermore, where opportunities arise to improve the biophysical and social environmental quality it should be investigated and implemented as appropriate (for example alien plant and erosion control in the undeveloped areas).

The objectives of the EMPr are guided by the NEMA and EIA Regulations (amended) with the focus of ensuring sustainable development over the longer term.

A copy of the Environmental Authorisation and this EMPr must be available at the site/s at all times. Relevant staff must be acquainted with the contents of the documentation.

9. MANAGEMENT OUTCOMES

The EMPr should guide the Holder of the Authorisation/Farm Manager and it should be implemented as an auditing list during the commencement of the authorised activities. Mitigation measures have been indicated for each management aspect or activity that may potentially result in impacts on the receiving environment. Refer to Table 4 for the identified impacts and rated significance as well as the expected significance for each impact after mitigation is implemented.

Compliance with the EMPr should be monitored by the ECO and Department.

The management outcome of each identified measure is to either prevent, minimise and/or remediate potential impacts to a degree that is environmentally acceptable.

10. PROJECT-SPECIFIC CONDITIONS

All the conditions as set out in the environmental authorisation is specific to this project and are to be read in conjunction with all other environmental documentation and permits. The conditions set out are proposed for the clearing of the authorised sites.

The discovery of any sites with archaeological or historical interest that have not been identified must be treated as specified in the EMPr. Although the focus is on the phase during which vegetation will be cleared for the agricultural side, some general measures with regards to the operational (farming phase is included).

There are on-site measures specific to the protection of the surrounding undeveloped environment that has been identified. Implementation and monitoring of the proposed measures will ensure due consideration of the natural environment.

ENVIRONMENTAL MANAGEMENT MEASURES: PLANNING AND CLEARING

Activity/Aspect / Impact	Mitigation Required	Responsibility	Frequency/ Implementation
PLANNING			
1. General			
<p>1.1 Terrestrial ecology Potential impacts:</p> <ul style="list-style-type: none"> ○ Impact on terrestrial sensitive ecology – removal and loss of conservation important species. 	<ul style="list-style-type: none"> ▪ A 10m buffer line must be delineated around the outer edges of each cultivation site where adjacent to drainage features <u>before any clearance starts</u>. An appropriately skilled person must do this. ▪ The area in between the edge of the lands and buffer zone can be used for a firebreak and where necessary a service road for the additional purposes of maintenance and access to alien vegetation control parties. ▪ Exclude any farm management activities from the buffer zone expect alien plant control. Fire breaks must be planned outside of the buffers. ▪ The laying out of the buffer line must not result in a significant loss of any large indigenous trees. ▪ Obtain the necessary permits and licences from DAFF or MTPA for the relocation or destruction of any protected trees, plants and/or animals before site clearance. ▪ Retain the <i>Ficus sycomorus</i> specimen on site 2. ▪ The applicant should replant a similar number of Marula trees to that which will be lost alongside fence and roads where they will not be affected in future. ▪ Nesting raptors if found in any of the trees to be removed or in surrounds may not be disturbed. The ECO must ensure that such trees are monitored and not removed without the consultation of an expert in the field. ▪ During the clearing operation the reptiles, mammals and birds must be allowed to move freely into new safer habitats. ▪ The fence around the site/s must not consist of razor wire that will harm game or small animals that can still pass through the fence line. 	Holder of Authorisation/ Farm manager	Prior to start of clearance and throughout
<p>1.2 Surface water and aquatic ecology Potential impacts:</p> <ul style="list-style-type: none"> ○ Surface water pollution ○ Impacts on aquatic habitat and functioning 	<ul style="list-style-type: none"> ▪ The 10m buffer line must be delineated and demarcated <u>before any clearance starts</u>. Farm management activities are to take place outside of these buffers i.e no firebreaks etc. ▪ On-site stormwater management of the cultivated areas must be planned to ensure the slow release of runoff into the receiving environment, specifically into the drainage lines. ▪ Remove exotic vegetation in the adjacent drainage lines and riparian area/s and maintain these areas. ▪ Erosion and siltation measures should be incorporated into the planning of the orchard layouts. 	Holder of Authorisation/ Farm manager	Prior to start of clearance and throughout
<p>1.3 Soil Potential impacts:</p> <ul style="list-style-type: none"> ○ Soil erosion 	<ul style="list-style-type: none"> ▪ Tree lines should be planned to follow natural contours as far as practically possible to prevent increased loss of topsoil into the drainage lines. Alternatively sufficient contour walls must be planned and implemented to protect the drainage lines. 	Holder of Authorisation/ Farm manager	Prior to start of clearance and throughout

Activity/Aspect / Impact	Mitigation Required	Responsibility	Frequency/ Implementation
<ul style="list-style-type: none"> ○ Loss of topsoil ○ Loss of cultivation area ○ Loss of natural resources ○ Surface water pollution 	<ul style="list-style-type: none"> ▪ Tillage in between tree lines must be minimised. ▪ Irrigation planning must take into account the soil properties. <p>Measures and findings with regards to the different soil types as per the Land Suitability Evaluation report:</p> <p><u>Hutton soils:</u></p> <ul style="list-style-type: none"> ➢ Because of the good drainage careful irrigation scheduling is essential, a drip or micro irrigation system is recommended. ➢ Nutrients: Below average levels of N are generally required. ➢ Note that the soil has: <ul style="list-style-type: none"> • a low N + S mineralization capacity. • a low base status and a low P fixation. • moderate K reserves. • Split applications are recommended. <p><u>Bainsvlei soils:</u></p> <ul style="list-style-type: none"> ➢ Because of the moderate to good drainage careful irrigation scheduling is essential, a drip or micro irrigation system is recommended. ➢ Moderate salinity build up may occur. <p><u>Oakleaf soils:</u></p> <ul style="list-style-type: none"> ➢ High productive potential soil with physical and chemical properties. ➢ Soil should not be worked when too wet or dry. ➢ Irrigation scheduling is essential, a drip or micro irrigation system is recommended. Moderate salinity build up may occur. ➢ Compaction may be a problem on soils with a high proportion of silt. ➢ Low base status, above average amounts of fertilizer may be needed. <p><u>Shortlands soils:</u></p> <ul style="list-style-type: none"> ➢ High productive potential soil with physical and chemical properties. ➢ Soil should not be worked when to wet or dry. ➢ Erosion hazard: very low. ➢ Irrigation scheduling is essential, a drip or micro irrigation system is recommended. ➢ Low salinity hazard unless low quality irrigation water is used. ➢ Moderate base status, above average N mineralization and very little denitrification problems, higher amounts of K may be needed. <p>*****Also refer to section 5.2</p>		

Activity/Aspect / Impact	Mitigation Required	Responsibility	Frequency/ Implementation
CLEARING OF INDIGENOUS VEGETATION			
2. Site establishment			
2.1 General Potential impacts: o Health impacts o Ecology, fauna and flora	<ul style="list-style-type: none"> ▪ Provide the necessary refuse bins with sealed lids at the staff eating area if any at the sites. Bins must be emptied on a regular basis at the domestic waste disposal area of the farm/site. ▪ Bins must be animal proof and waste storage must not attract animals. ▪ Potable water for human consumption and personal hygiene must be available to workers. ▪ Adequate provision must be made for staff ablution facilities. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
2.2 Fires Potential Impacts: o Ecology, fauna and flora o Health and safety impacts o Impacts on adjacent land users o Air quality decline	<ul style="list-style-type: none"> ▪ All reasonable steps to avoid fires must be taken. ▪ Open fires for cooking purposes if allowed must only be allowed at a demarcated area. ▪ The farm/orchard manager must be prepared for the event of a fire. ▪ The farm manager must take all reasonable steps to extinguish any fires where other individuals may have started a fire, either intentionally or unintentionally. ▪ Burning of wastes (paper, plastics etc.) is strictly forbidden. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
2.3 Site clearing Potential impact: o Loss of terrestrial ecology – important fauna and flora o Soil disturbances o Surface water pollution	<ul style="list-style-type: none"> ▪ Utilise the method for vegetation clearing most appropriate for the environment. Use mechanical methods wherever possible. ▪ Disturbances must be strictly limited to the authorised site/s – areas suitable and authorised for cultivation. ▪ Prior to clearance identify all the plants and animals that can be translocated. Obtain the necessary permits for the disturbance or removal of species of conservation importance. ▪ Relocate all plants into the surrounding natural environment as far as possible. Where applicable seeds can be harvested for propagation. ▪ The disturbance of breeding habitats of birds and wildlife is strictly prohibited. ▪ Where possible, only remove the woody vegetation and protected plants and not all the ground cover in between the planned tree lines. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
2.4 Vehicles, access Potential Impacts; o Soil, Surface water pollution, Ecology	<ul style="list-style-type: none"> ▪ Contain fuel, oil or chemical spills, and arrange clean up in the event of spillage. ▪ No temporary roads within sensitive areas must be allowed. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
3. Heritage resource management and protection			
3.1 Archaeological sites	<ul style="list-style-type: none"> ▪ If any site/s of cultural significance or heritage importance are discovered on site during the clearance, work must cease immediately in that area. The area must be secured and an archaeologist should be contacted. Construction may proceed in the relevant area once agreed mitigation measures have been implemented and approval from Heritage Resources Agency has been obtained. 	Holder of Authorisation Archaeologist ECO	Start and duration of clearing

Activity/Aspect / Impact	Mitigation Required	Responsibility	Frequency/ Implementation
4. Fauna and flora management			
<p>4.1 Ecologically sensitive areas, fauna and flora</p> <p>Potential impacts:</p> <ul style="list-style-type: none"> ○ Removal of vegetation ○ Loss of sensitive or important plant species ○ Impacts on sensitive fauna ○ Erosion 	<ul style="list-style-type: none"> ▪ Clearing activities must be limited to the areas suitable for cultivation as authorised. Maintain the vegetation buffers around the riparian areas. ▪ No clearing apart from alien plant control activities as approved by the holder of the authorisation must be allowed in any of the drainage lines, riparian areas. No farm management activities such as fire breaks must be included in the buffers. ▪ Minimise unnecessary disturbances. Minimise vegetation clearing to the areas as authorised for clearing. ▪ Workers/staff must be familiarised with the sensitivity of area and their movement must be controlled. ▪ Prior to any site clearance identify all the plants and animals that can be translocated. Obtain the necessary permits for the disturbance of species of conservation importance from DAFF and the MTPA. ▪ Translocation of conservation important plants within the impact footprints should be considered above destruction. Identified conservation important plants must be relocated to adjacent representative habitat. This should be done under the supervision of an experienced botanist / horticulturist. ▪ Where appropriate, seeds can be harvested for propagation. ▪ No stripped vegetative or soil material must be disposed of in the drainage lines. ▪ The removed woody vegetation can be used to stabilise areas prone to erosion. ▪ All reasonable steps to avoid unnecessary fires must be taken. Open fires for cooking purposes in demarcated area only. ▪ Collection of firewood or any other plant resources by farm workers especially in areas not cleared is prohibited. ▪ No wild animals may under any circumstances be handled, removed, injured or killed. ▪ No poaching/killing of any plants or animals will be allowed. ▪ Evidence of poaching among construction teams should be followed up by the ECO and guilty parties should be prosecuted under the MNCA. ▪ Prevent the creation of erosion prone areas. ▪ Monitor the surrounding areas and/or drainage line/s and riparian area/s for signs of erosion, contamination and invader species during the clearing period and implement corrective measures as required. 	<p>Holder of Authorisation/Farm manager ECO</p>	<p>Start and duration of clearing</p>
<p>4.2 Alien vegetation</p> <p>Potential impacts:</p> <ul style="list-style-type: none"> ○ Invasion of alien plant species 	<ul style="list-style-type: none"> ▪ An ongoing alien plant eradication and management programme should be set up for the untransformed areas, drainage lines and riparian areas. Weed control measures should be implemented for several seasons, allowing indigenous pioneer species a chance to colonise the bare soil. Control of alien species must be done as per the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) Alien and Invasive Species Lists, 	<p>Holder of Authorisation/ Farm manager ECO</p>	<p>Start and duration of clearing</p>

Activity/Aspect / Impact	Mitigation Required	Responsibility	Frequency/ Implementation
	2014. <ul style="list-style-type: none"> ▪ Cleared areas must be stabilised and planted as soon as possible in order to minimise the risk of an increase in alien vegetation. 		
5. Soil management			
5.1 Erosion protection Potential impacts: <ul style="list-style-type: none"> ○ Erosion of currently undisturbed areas ○ Loss of topsoil 	<ul style="list-style-type: none"> ▪ Plan and create the tree lines to follow the natural contours as far as possible. Alternatively create sufficient contour berms to limit erosion of the disturbed soils. ▪ The areas should be cleared and prepared only when the applicant is ready to start planting. ▪ Site appropriate mitigation must form a part of the plan to prevent and reduce the risk of any potential erosion. ▪ Prevent creation of erosion prone sites which may result in sedimentation. ▪ Corrective actions have to be taken as and when required to stop any signs of erosion. ▪ The release of storm water must not be concentrated. Any run-off must be released in such a way that the erosion potential of the water is reduced. ▪ Erosion control structures must be maintained. ▪ All areas disturbed during the clearance but not earmarked for planting must be suitably protected against erosion. The exposed soil surfaces must be re-vegetated and/or stabilised as soon as practically possible. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
5.2 Management strategy to ensure successful cultivation and protect soil and water resources Potential impacts: <ul style="list-style-type: none"> ○ Erosion ○ Loss of topsoil ○ Loss of soil water holding capacity ○ Loss of irrigation potential of land ○ Loss of irrigation water ○ Die-off of crops 	<ul style="list-style-type: none"> ▪ Strip cropping is recommended. ▪ Ridges must be at least 700 mm high and 1,5 to 2m wide. ▪ Ridging and ripping will assist in increasing effective rooting depth and indirectly increase the water holding capacity by increasing possible rooting volume, increasing rainfall use efficiency. ▪ Apply water at a rate that equals water uptake by the trees and that do not exceed infiltration rate. ▪ Ridges should not be re-compacted with tractor wheels running on the ridge as it is being constructed; ▪ Ridges must only be built with top-soil. ▪ Minimum tillage must be done on the in-between ridge areas. Plant the in-between ridge lines with a grass cover for eg. <i>Chloris gayana</i> – <i>Rhodes</i> grass. ▪ Plant the sides of the ridges with a ground cover as soon as possible after clearing. ▪ Irrigation scheduling is essential and drip or micro irrigation is recommended. 		
6. Water management			
6.1 Surface, ground and stormwater management Potential impacts: <ul style="list-style-type: none"> ○ Surface water pollution ○ Ground water pollution 	<ul style="list-style-type: none"> ▪ The riparian buffer must be clearly demarcated and clearing activities must be strictly controlled and limited to authorised areas. ▪ From the start of clearance in preparation for planting, stormwater management appropriate for the receiving environment must be implemented. ▪ Stormwater run-off from cleared areas must not be concentrated. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing

Activity/Aspect / Impact	Mitigation Required	Responsibility	Frequency/ Implementation
	<ul style="list-style-type: none"> ▪ Run-off must be managed prior to entering natural water resources. ▪ Mechanisms like contour walls, sediment trapping, energy dissipating or other erosion control structures must be put in place where stormwater is released toward water resources. 		
6.2 Pollution control Potential impacts: <ul style="list-style-type: none"> ○ Surface water pollution and potential erosion 	<ul style="list-style-type: none"> ▪ Runoff must be controlled. Prevent the discharge of water containing polluting matter or visible suspended materials. ▪ Where pollution of the water resource may potentially occur, the farm manager must ensure adequate measures are in place to prevent pollution. ▪ Corrective actions have to be taken as and when required to stop any signs of erosion. ▪ Stabilise disturbed soil surfaces as soon as practically possible. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
7. Air quality			
7.1 Dust emissions Potential impacts: <ul style="list-style-type: none"> ○ Air quality decline 	<ul style="list-style-type: none"> ▪ Handling and transport of erodible materials must be avoided during periods of excessive wind. ▪ Exposed soil surfaces must be appropriately planted, re-vegetated, covered or stabilised as soon as practically possible. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
8. Waste management			
8.1 Solid waste (Removed vegetation and general waste) Potential impacts: <ul style="list-style-type: none"> ○ Surface water pollution ○ Visual 	<ul style="list-style-type: none"> ▪ No on site littering or dumping of waste of any nature must be allowed. ▪ Domestic waste may be burned or buried on site. Littering and pollution must be prevented. ▪ Waste must be collected at demarcated areas only and regularly disposed of at a registered landfill site. Litter must not attract or pose a threat to animals. ▪ Waste must be recycled where possible. Adequate containers or bins for waste removal must be supplied on site at demarcated areas. ▪ No stripped vegetative or soil material must be disposed of into the drainage lines, buffer or riparian zones. 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
9. Health, safety and security			
9.1 General Potential impacts: <ul style="list-style-type: none"> ○ Health and safety risks to workers, public 	<ul style="list-style-type: none"> ▪ The restriction of movement of staff must be made a condition. ▪ The Holder of the Authorisation must comply with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). 	Holder of Authorisation/ Farm manager ECO	Start and duration of clearing
FARMING AND/OR OPERATION OF CLEARED AREAS			
10. General			
10.1 General Potential impacts: <ul style="list-style-type: none"> ○ Health and safety ○ Social ○ Surface water pollution 	<ul style="list-style-type: none"> ▪ Internal roads must be maintained and protected from erosion. ▪ Access to other properties over or close to the applicant's sites may not be prohibited. ▪ Chemicals are to be applied only by trained personnel. No containers may be emptied into the receiving environment or drainage lines. ▪ Only do pest control according to a spray regime as proposed by a crop protection consultant. 	Holder of Authorisation/ Farm manager	Operation

Activity/Aspect / Impact	Mitigation Required	Responsibility	Frequency/ Implementation
<ul style="list-style-type: none"> ○ Air pollution 	<p>Such programmes must take into account the receiving and surrounding natural environment.</p> <ul style="list-style-type: none"> ▪ The use of other poisons or chemicals must be strictly monitored, especially close to the identified water resources (drainage lines). ▪ Maintain the ecological buffers as indicated on the layout maps and as should be demarcated. No farming related activities must be allowed in these areas. ▪ Any firebreaks must be made in addition to the buffer zones. The buffer areas should not form a part of the firebreaks around the orchards and the vegetation must be maintained. ▪ Corrective actions have to be taken as and when required to stop any signs of erosion on the site/s or sedimentation of the drainage lines. ▪ Maintain the natural vegetation or ground cover in between the tree lines. ▪ Water used for irrigation must be measured and only within allowable abstraction volumes as set by the irrigation board and regional water authority. ▪ Operational activities that involve noisy machinery such as spraying must take place only during daytime hours only 6:00am to 18:00 pm and not on Sundays or public holidays. ▪ Should complaints be made that noise is a constant nuisance to neighbours the applicant must investigate noise reducing equipment. Steps must be taken to reduce noise levels to a level which is more acceptable and within allowable levels. ▪ Monitor the sites for any signs of erosion during the operation phase in order for it to be addressed promptly. 		

Appendix 1: Site plan

