DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr):

Proposed cultivation of 35ha of indigenous grassland on Newfields Farm near Underberg, KwaSani Municipality

EIA Ref. No.: DC43/0022/2012

PREPARED FOR: Scotston Family Trust

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1 INTRODUCTION

The Scotston Family Trust has made an application to the KwaZulu-Natal Department of Agriculture and Environmental Affairs (DAEA) to cultivate 35ha of indigenous grassland on Newfields Farm, KwaSani Municipality.

The project initially entailed the proposed clearance of approximately 35ha of grassland ('veld') to enable the planting of an annual crop to provide fodder for the Applicant's dairy herd. However, the size of the proposed cultivation has decreased to **approximately 33ha** as per the recommendations of the specialist Biodiversity Assessment conducted for the project.

In the first year, the site would be ploughed and planted to radishes and maize. Thereafter, *Eragrostis* would be planted on a permanent basis, using a direct drilling ('no till') method. The resultant *Eragrostis* crop would be baled and fed to the dairy herd during the winter months.

In terms of the Amended EIA Regulations (2010) under the National Environmental Management Act (NEMA, Act No 107 of 1998), the proposed veld transformation triggers Listed Activities published in Government Notice No R. 546 and thus a Basic Assessment Process is required. This Environmental Management Programme is a component of the Process and will guide the implementation phases of the proposed activity, should the application be successful.

2 AIM OF AN ENVIRONMENTAL MANAGEMENT PROGRAMME

The aim of this EMPr is to identify and minimise, as far as possible, potential impacts that cultivating 33ha of grassland may have on the surrounding biophysical and socio-economic environment during the following phases:

i) Pre-construction and planning;
ii) Construction / ploughing;
iii) Post-ploughing and rehabilitation; and
iv) Operation / occupation.

The purpose of the EMPr is to:

- Encourage good management practices through planning and commitment to environmental issues;
- Define how the management of the environment is reported and performance evaluated;
- Provide rational and practical environmental guidelines to:
  - Minimise disturbance of the natural environment surrounding the new pasture;
  - Prevent or minimise all forms of pollution through all phases;
  - Protect indigenous flora and fauna remaining on the farm and surrounds;
  - Comply with all applicable laws, regulations, standards and guidelines for the protection of the

environment; and,
  - Adopt the best practicable means available to prevent or minimise adverse environmental impacts.
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of wastes;
- Describe all monitoring procedures required to identify impacts on the environment; and
- Make employees and those carrying out work on the farm aware of environmental obligations.

3 ENVIRONMENTAL COMPLIANCE

3.1 RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

The Applicant and/or senior staff (Farm manger) will be responsible for environmental management on site during all four phases (Pre-Ploughing and Planning, Ploughing, Post-Ploughing and Rehabilitation, and Operation).

An independent Environmental Control Officer (ECO) will be required to conduct regular inspections and monitoring of the EMPr implementation throughout the duration of the Pre-Ploughing, Ploughing, Post-Ploughing and Rehabilitation Phases. During these phases, the ECO should produce a monitoring report for submission to the Applicant, as well as to the Compliance Department of the KwaZulu-Natal Department of Agriculture and Environmental Affairs (DAEA). The DAEA is responsible for determining the frequency of the environmental compliance monitoring to be conducted by the ECO and of the monitoring reports to be compiled and submitted to their Department.

3.2 TRAINING OF EMPLOYEES

The Applicant has a responsibility to ensure that all those people involved in the project through all phases of the project are aware of and are familiar with the environmental requirements for the project. This EMPr should be part of the Terms of Reference (ToR) for all Farm Managers, Suppliers, Staff and Visitors.

During the Pre-Ploughing, Ploughing, Post-Ploughing and Rehabilitation Phases, the Farm Manager is required to give some assurance that they understand the contents and requirements of the EMPr and that they will comply with the conditions therein. All senior and supervisory staff members must familiarise themselves with the full contents of this EMPr. They must know and understand the specifications of the EMPr and be able to assist other staff members in matters relating to the EMPr.

During the Operational Phase, the Applicant, as well as all senior and supervisory staff members, must understand and comply fully with the contents of this EMPr. In addition, all other site personnel must be educated in the contents of this document.

3.3 COMPLAINTS REGISTER AND ENVIRONMENTAL INCIDENT BOOK

Any complaints received from the community must be registered and recorded by the Applicant or Farm Manger in a Complaints Register, which is to be kept on site (Appendix 1). The complaint must be brought to the

attention of the ECO, who will ensure that the Applicant / Farm Manager responds accordingly. The following information must be recorded:

- Time, date and nature of the complaint;
- Response and investigation undertaken; and
- Actions taken and by whom.

All complaints received will need to be investigated and a response is to be given to the complainant as soon as possible.

All environmental incidents occurring on the site must be recorded in an Environmental Incident Register (see Appendix 2) and the following information must be provided:

- Time, date, location and nature of the incident; and
- Actions taken and by whom.

3.4 ENVIRONMENTAL MONITORING

Environmental monitoring of the Ploughing and Rehabilitation Phases of the development will need to be undertaken by the ECO on a regular basis, the frequency of which will need to be determined by the DAEA. Monitoring will be necessary to ensure compliance with all aspects of the EMPr. During the Operational Phase, environmental monitoring will need to continue, but on a reduced frequency, to be decided by the DAEA.

To facilitate communication between the ECO, Applicant, Farm Manager and farm labourers, it is important that a suitable chain of command is structured that will ensure that the ECO's recommendations reach the necessary person. In this way, penalties as a result of non-compliances with the EMPr may be justified as failure to comply with instruction from the highest authority.

During the Ploughing and Rehabilitation Phases, the ECO will communicate any environmental issues to the Applicant / Farm Manager. During the Operational Phase, the ECO will communicate any environmental issues to the Applicant / Farm Manager, who will in turn communicate these concerns to the relevant senior or supervisory staff member.

3.5 NON-COMPLIANCE WITH THE EMPR

Difficulties may be encountered with carrying out mitigation measures that could result in future non-compliance. The Applicant / Farm Manager shall put in place procedures to motivate staff members to comply with this EMPr, and to deal with acts of non-compliance, or malicious damage to the environment. Penalties for non-compliance need to be discussed with the Applicant / Farm Manager at the earliest stage.

3.6 EMPR AMENDMENTS / EMPR INSTRUCTIONS

No EMPr amendments (relaxation or revision of any mitigation measures) shall be allowed without approval from the relevant authority (DAEA). Motivations for amendments to the EMPr may be discussed with the ECO.

The ECO may propose EMPr amendments on behalf of the Applicant or issue EMPr instructions (corrective

actions, remediation and rehabilitation). These amendments or instructions issued by ECO shall be implemented within the specified time frame.

4 LEGISLATIVE FRAMEWORK

4.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (ACT 108 OF 1996)

The Constitution of the Republic of South Africa is the legal source for all law, including environmental law, in South Africa. The Bill of Rights is fundamental to the Constitution of the Republic of South Africa and Section 24 states that:

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

4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

The National Environmental Management Act (NEMA) is South Africa's overarching environmental legislation and has, as its primary objective to provide for co-operative 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 to provide for matters connected therewith (Government Gazette, 1998).

The Act provides for the right to an environment that is not harmful to the health and well-being of South African citizens; the equitable distribution of natural resources, sustainable development, environmental protection and the formulation of environmental management frameworks (Government Gazette, 1998).

In terms of Section 28 (1) of the NEMA:

"(1) 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 in authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. (2)…the persons on whom subsection (1) imposes and obligation to take reasonable measures, including and owner or land, a person in control of land or premises, or a person who has a right to use the land or premises on which or in which – (a) any activity or process is or was performed or undertaken; or (b) any other situation exists, which causes or has caused or is likely to cause significant pollution or degradation of the environment. (3) The measures required in terms of subsection (1) may include measures to – (a) investigate, assess and evaluate the impact on the environment; (b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment; (c)

cease, modify or control any act, activity or process causing pollution or degradation; (d) contain or prevent the movement of pollutants or the cause of degradation; (e) eliminate the source of the pollution or degradation; or (f) remedy the effects of the pollution or degradation…"

4.3 SUSTAINABLE DEVELOPMENT

The principle of Sustainable Development has been established in the Constitution of the Republic of South Africa (108 of 1996) and given effect by NEMA. Section 1 (29) of NEMA states that:

"1(29)…Sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations."

Similarly the guiding principles established in Section 2 (3) of NEMA state that:

"2(3) Development must be socially, environmentally and economically sustainable. (4) (a) Sustainable development requires the consideration of all relevant factors including the following: (i) That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied; (ii) that pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied…(vii) that negative impacts on the environment and on peoples environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied."

Thus Sustainable Development requires that there is an integration of social, environmental and developmental concerns and that greater attention to each of these aspects of development will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future (United Nations Department of Economic and Social Affairs, Division for Sustainable Development, 1992).

4.4 POLLUTER PAYS PRINCIPLE

The 'Polluter Pays' Principle provides that 'the cost of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment'.

NEMA (Section 28) imposes a duty of care on every person who causes, has caused or may cause significant pollution or degradation of the environmental to take reasonable measures to prevent the pollution or degradation of the environment from occurring, continuing or reoccurring. Insofar as such harm to the environment is authorised by law or cannot reasonably be avoided, NEMA requires that the pollution must be minimised and rectified.

5 THE PROPOSED ACTIVITY

5.1 LOCATION, ACCESS AND LAND DESCRIPTION

The site, Portion 1 of the Farm Lot FP 198 No 8759, is located approximately 12km south east of Underberg, within the KwaSani Municipality. The property in total is 377.3735 ha and the proposed site for cultivation is approximately 33ha.

The proposed site can be accessed by travelling from Pietermaritzburg to Underberg on the R617. After approximately 23km from Bulwer, turn right to Pevensey, (the road opposite the turning to Coleford). The site is located on the left hand side, approximately 1km from the R617 and is accessed through a farm gate approximately 200m from the R617. Please refer to Figures 1 and 2.

Co-ordinates for the centre of the site are as follows:

- 29^{o} 49' 37.69" S; and
- 29 ^{o} 36' 43.78" E.

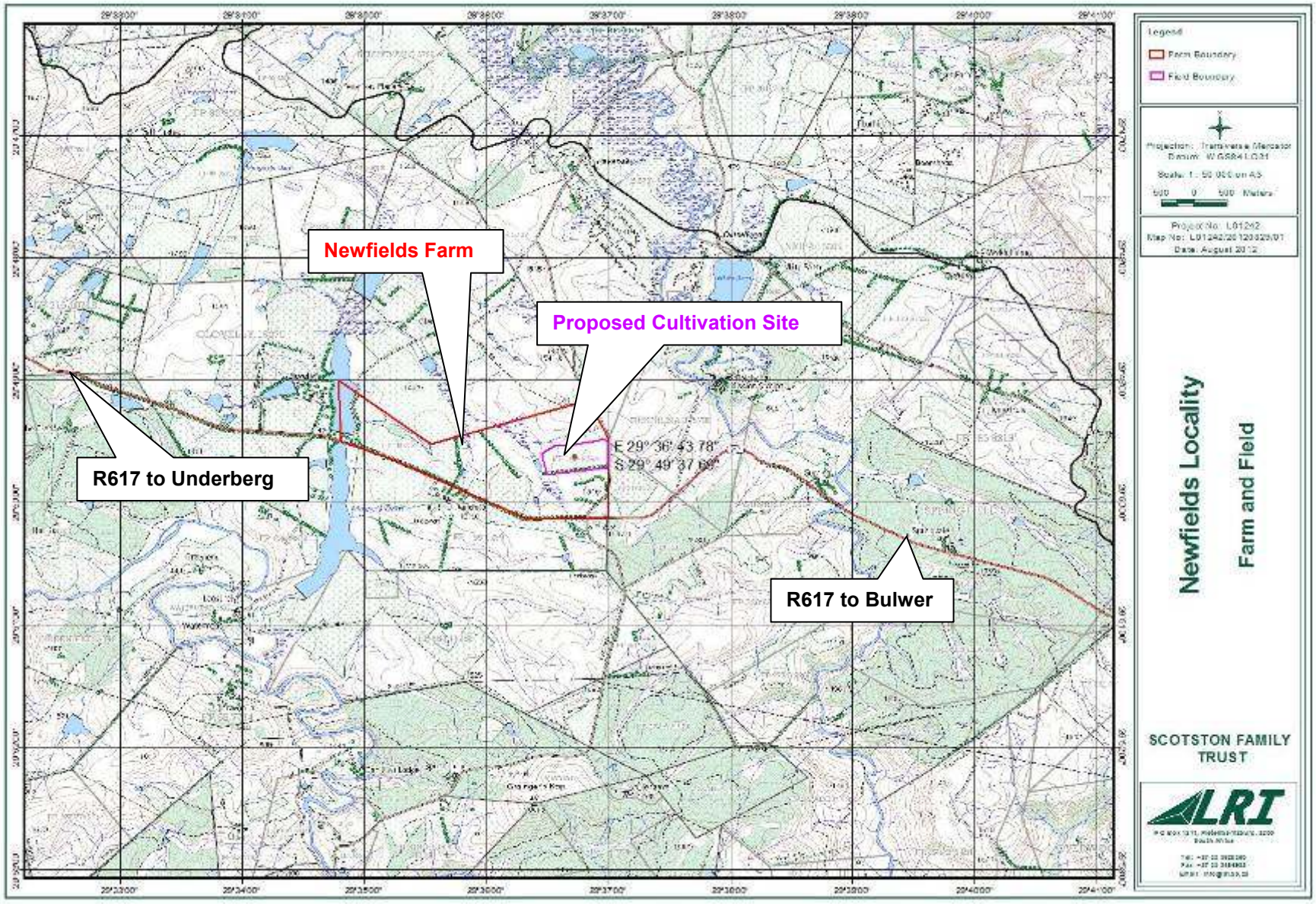

FIGURE 1: Topographic map showing location of proposed cultivation site on Newfields Farm, near Underberg (Source: LRI)

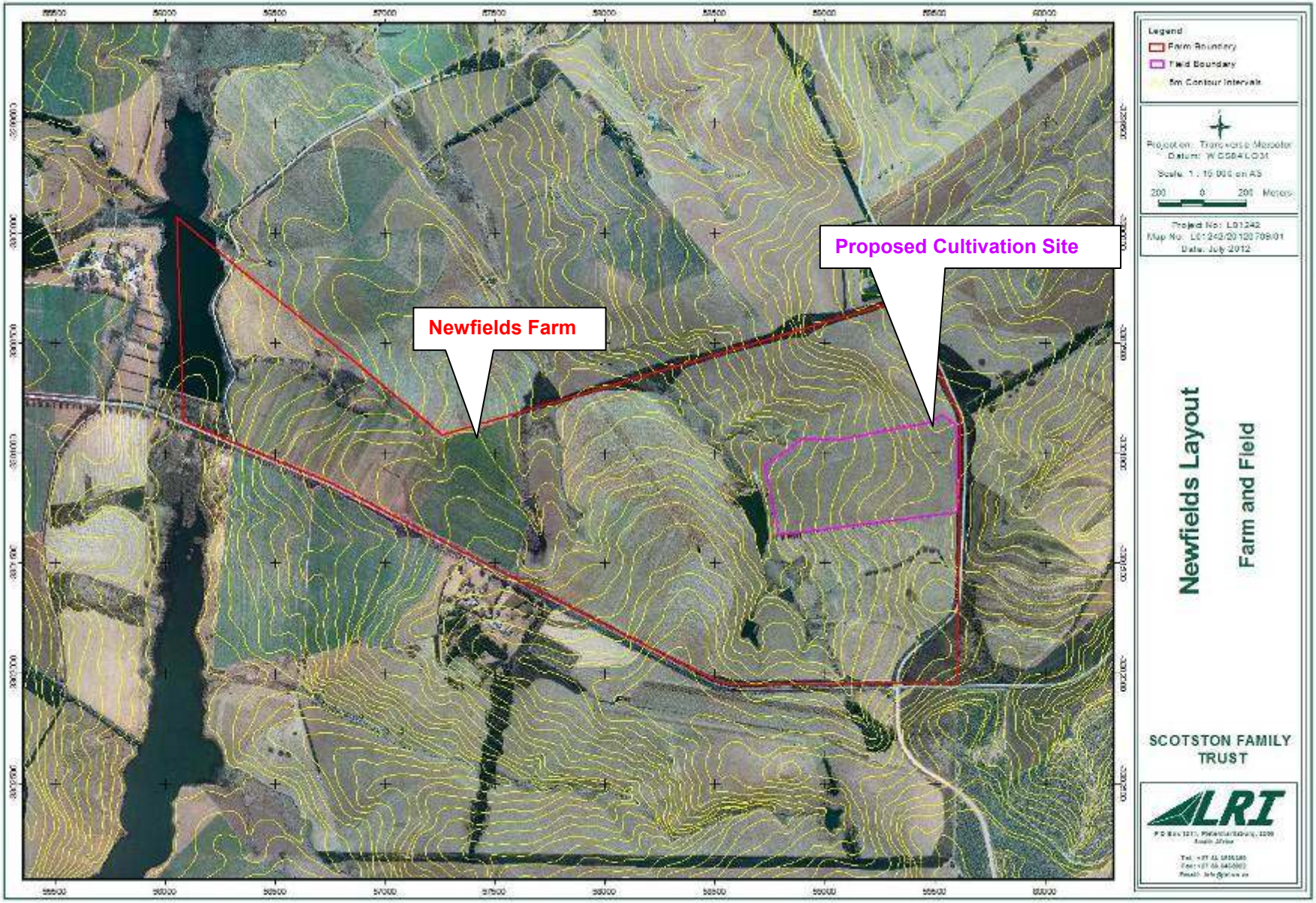

FIGURE 2: Aerial map showing location of proposed cultivation site on Newfields Farm, near Underberg (Source: LRI)

6 PRE-PLOUGHING

Potential environmental impacts, impact sources and objectives are described, and environmental management mitigation measures to be implemented during the planning / pre-ploughing phase are specified. The Applicant / Farm Manager shall adhere to these measures at all times.

In the tables that follow, Farm Manager and Environmental Control Officer, have been abbreviated to FM and ECO, respectively.

TABLE 1: PRE-PLOGHING PHASE

PRE-PLOUGHING				
LAYOUT	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The site approved for ploughing must be clearly and accurately pegged out (i.e. 33ha).	FM / ECO	Before ploughing	Site inspection	
• Access routes to the site must be marked out, existing roads and access routes must be used where possible.	FM / ECO	Before ploughing	Site inspection	
• A storage area must be marked out if any equipment is to be stored on site during the ploughing process.	FM	Before ploughing	Site inspection	
• The storage area is to be maintained in a neat and orderly state at all times. The 80 metre conservation buffer (as per the Biodiversity Assessment) must be clearly measured and marked to ensure the ploughing does not encroach into this area.	FM	Before and during ploughing	Site inspection	
GENERAL SUBSTANCES AND MATERIALS	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Choice of location for storage areas must take into account prevailing winds, distance to water bodies and general on-site topography. Storage areas must be outside of the 1:100 year floodline.	FM/ECO	Before ploughing	Site inspection	
• No fuel is to be stored on site.	FM/ ECO	Duration of ploughing	Site inspection	
• All handling of chemicals or fertilizers, and the repair, maintenance and storage of vehicles and equipment must be undertaken on the impermeable working surface in accordance with the Materials Safety Data Sheets (MSDS).	FM / ECO	Ongoing	Review of MSDSs	
• Fire prevention facilities must be present and easily accessible at all storage facilities.	FM/ECO	During site establishment	Site inspection	
• Materials stored on site should be kept to a minimum to reduce the risk of theft. They should also be safe from access by children / animals etc.				

HAZARDOUS SUBSTANCES	RESPONSIBILITY	OCCURRENCE	METHOD	✓ / ×
• The MSDSs must be readily available for all chemicals / fertilizers to be used on site. Where possible and available, MSDSs should include additional information on ecological impacts and measures to minimise and mitigate against any negative environmental impacts in the result of an accidental spill.	FM	Before ploughing commences	Review of MSDSs	
• Storage areas containing chemicals / fertilizer must be clearly sign-posted.	FM/ ECO	During site establishment	Site inspection	
• Staff handling chemicals / fertilizer must be aware of their potential impacts and follow appropriate safety measures. Appropriate personal protective equipment (PPE) must be made available.	FM/ ECO	During staff induction / Ongoing	Inspection of PPE, liaison with personnel	
ENVIRONMENTAL EDUCATION AND AWARENESS	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• It must be ensured that all site personnel have a basic level of environmental awareness training. The Farm Manager must ensure that all ploughing staff are aware of the following: – What is meant by "environment"; – Why the environment needs to be protected and conserved; – How ploughing activities can impact on the environment; – What can be done to mitigate against such impacts; – Awareness of emergency spills response provisions; and – Social responsibility during ploughing (being considerate to nearby residents etc.).	FM / ECO	During staff induction / Ongoing	Environmental Training of staff	
• It is the Farm Manager's responsibility to provide the site workers with adequate training and environmental understanding of environmental requirements and the boundaries of the site.	FM / ECO	Prior to moving onto site	Liaison with FM	
• Translators are to be used if necessary, to ensure that all staff understand what is required of them in terms of the EMPr.	FM / ECO	Ongoing	Liaison with FM	
• The need for a 'clean site' policy needs to be explained to everyone working on site.	ECO	During staff induction	Environmental Training of staff	
WORKER CONDUCT ON SITE	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• A general regard for the social and ecological well being of the site and surrounding areas is expected of the site staff. Workers need to be made aware of the following rules: – Excessive noise is to be prevented; – Ploughing staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives; – Trespassing on private / commercial properties adjoining the site is forbidden; and – Driving under the influence of alcohol is prohibited.	ECO	During staff induction, followed by ongoing monitoring.	Environmental Training of staff; liaison with FM & Personnel	

DUST / AIR POLLUTION	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Areas that have been stripped of vegetation must be dampened periodically to avoid excessive dust.	FM	Ongoing	Site inspection	
FLORA	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Care must be taken to avoid the introduction of invasive plant species to the site and surrounding areas.	FM / ECO	Ongoing	Site inspection	
• Existing alien vegetation must be removed. Mechanical methods are preferred to the use of chemicals, however soil disturbance must be minimised where possible.	FM / ECO	Ongoing	Site inspection	
• No trees / shrubs / groundcover may be removed or vegetation stripped outside the designated ploughing area.	FM / ECO	Before and during ploughing	Site inspection	
COMMUNICATION WITH INTERESTED & AFFECTED PARTIES (IAPs)	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Residents, tenants and landowners adjacent to the site are to be notified in advance of any known potential risks with the ploughing and associated activities.	FM	Ongoing	Liaison with C & neighbours	
PREVENTION OF EROSION & CONTAMINATION	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Ploughing should take place along contours, and not against them or at any angle to them, to prevent erosion and sheet wash down slopes.	FM	Before ploughing	Review of ploughing design	
• Soil moisture must be adequate before ploughing takes place.	FM	Before ploughing	Site inspection	
• Ploughing should take place in early spring, after the first rains, to ensure the pasture establishes quickly and to avoid prolonged soil exposure that could lead to water and wind erosion.	FM	Before ploughing	Site inspection	
• Should fertilizer be required, top dressing should not be conducted until the site is well vegetated to reduce the surface run-off during rainfall events.	FM	Before ploughing	Site inspection	
• Where possible, and if necessary, avoid applying fertilizer prior to forecasted large rainfall events to reduce the potential for stormwater runoff and eutrophication of natural water resources.	FM	Before ploughing	Site inspection	
• An earthen berm must be constructed along the upslope perimeters of storage areas, to divert excess surface runoff away from potentially contaminated surfaces within the storage areas.	FM / ECO	During site establishment.	Site inspection	
• Earthen berms must also be constructed along the down slope perimeter of the storage areas, to contain any contaminated runoff.	FM / ECO	During site establishment.	Site inspection	

Additional Notes:

7 PLOUGHING

Most environmental impacts of developments occur in the Ploughing Phase of the project. As a result, the regulation of the ploughing team and the general conduct of the farm workers is an essential component of this EMPr and must be carried out in conjunction with the ECO.

PLOUGHING PHASE				
SITE ACCESS	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The Applicant and/or Farm Manager is to ensure that access road is kept to a minimum distance and width for only one vehicle.	FM	When necessary	Site inspection	
• Steep areas must be avoided when creating site access.	FM	When necessary	Site inspection	
• The access road must be well maintained and free of alien invasive vegetation.	FM	Ongoing	Site Inspection	
WASTE MANAGEMENT	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Any waste material must be appropriately disposed of (i.e. at a permitted landfill site, recycled, used by the community).	FM / ECO	Ongoing	Site Inspection	
• No waste is to be buried or burned on site.	FM / ECO	Ongoing	Site inspection	
ABLUTION FACILITIES	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Ablutions must be provided for workers of the ploughing team.	FM	Ongoing	Site inspection	
• Temporary toilets may not be located within 100 m of a watercourse.	FM / ECO	Ongoing	Site inspection	
• No pit latrines are to be used.	FM / ECO	During site establishment	Site inspection	
• Performing ablutions outside toilet facilities is prohibited.	FM / ECO	Weekly	Site inspection	
PROVISION OF WATER	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Potable water is to be sourced from an existing supply, and made available to all workers.	FM	Ongoing	Site inspection	
FAUNA AND FLORA	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The following requirements must be met to ensure the protection of the indigenous vegetation: – Employees will be subject to fines, should they be caught removing or damaging indigenous flora on site or on surrounding property; – Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas (particular attention must be paid to imported material); and – Disturbance to birds, animals and reptiles and their habitats outside the ploughing area is prohibited.	FM / ECO	During staff induction / Ongoing	Site inspection; Environmental Awareness Training (if necessary)	
• The trapping and killing of wild animals and disturbance to their habitats must be prevented. Strict controls and penalties must be enforced. Any incidences must be	FM / ECO	Ongoing	Site inspection	

reported to the Compliance Department of DAEA and Ezemvelo KZN Wildlife.				
• Ploughing activities must be confined to the approved ploughing site only.	FM / ECO	Ongoing	Site inspection	
• No indigenous or medicinal / 'muthi' plants may be collected or harvested at any stage of ploughing or operation, either from the property or from neighbouring properties.	FM / ECO	Ongoing	Site inspection	
• All alien vegetation must be removed from the access route before ploughing commences to reduce alien seed dispersal.	FM / ECO	At outset of project	Site inspection	
• The Farm Manager is to control and eradicate the spread of alien weeds during the project.	FM / ECO	Ongoing	Site inspection	
• Alien plants that have been removed must be discarded at an appropriate refuse site. Should alien vegetation have seeds, it should be transferred to the storage area where it can be burned in a controlled manner, with care taken not to disperse the seeds.	FM / ECO	When required	Site inspection	
• An 80 metre setback line is to be implemented as per the recommendation of the Biodiversity Assessment as attached to the Basic Assessment Report (Appendix D).	FM / ECO	At outset of project	Site inspection	
WATER QUALITY	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The Applicant and/or Farm Manager is to prevent the contamination of water by materials used during ploughing and ensure the following: – Implement measures to prevent seepage of liquid contaminants (e.g. engine oil) into ground where it could contaminate groundwater; and – Ensure prompt cleaning up of accidental spillages (Section 20 of the National Water Act (36 of 1998)).	FM / ECO	Weekly	Site inspection	
• The Applicant and/or Farm Manager is to prevent the contamination of hydrological features by diesel, grease, oil, etc. by ensuring that: – The machinery / equipment is maintained in a good operating condition; – Tractors and other vehicles are not repaired on site. – All parked vehicles must have drip trays in place to trap any spillages; and – Accidental spillages are cleaned up promptly and all contaminated material disposed appropriately.	FM / ECO	Weekly	Site inspection	
• Should fertilizer be required, top dressing should not be conducted until the site is well vegetated to reduce the surface run-off during rainfall events.	FM	Before ploughing	Site inspection	
• If necessary, and where possible, avoid applying fertilizer prior to forecasted large rainfall events to reduce the potential for stormwater runoff to carry fertilizers into the wetland area.	FM	Before ploughing	Site inspection	
• A 50 metre buffer is to be implemented around the onsite dam, as per the recommendation of the Wetland Delineation and Functional Assessment as attached to the Basic Assessment Report (Appendix D).	FM / ECO	At outset of project	Site inspection	
• All recommendations of the Wetland Delineation and Functional Assessment are to be implemented.	FM / ECO	Ongoing	Site inspection	

STORMWATER MANAGEMENT AND SOIL EROSION	RESPONSIBILITY	OCCURRENCE	METHOD	✓ / ×
• Ploughing should take place along contours, and not against them or at any angle to them, to prevent erosion.	FM	Before ploughing	Review of ploughing design	
• Unconfined surface flow must be contained to avoid soil erosion and contamination of water resources.	FM / ECO	Ongoing	Site inspection	
• Prompt replanting of the ploughed area must take place to minimise any soil loss that may occur during the transition from natural veld to pasture.	FM	Ongoing	Site inspection	
SOIL HANDLING	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Repeated handling of soil must be avoided as this will result in compaction and the loss of soil structure.	FM / ECO	Ongoing	Site inspection	
• Ploughing should take place when soil moisture is considered to be ideal. If ploughing takes place when the soil is too dry or too wet, the soil is likely to be overworked and lose its structure.	FM / ECO	Ongoing	Site inspection	
HAZARDOUS SUBSTANCES	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The handling and storage of chemicals / fertilizers must be in accordance with the MSDS and must be restricted to the farm storage area as the appropriate pollution control measures will need to be in place. If additional areas / sites are required for the storage or handling of hazardous substances, they must be assessed and approved by the ECO who will then instruct the Farm Manager to implement the appropriate controls.	FM / ECO	As additional hazardous substances are required	Site inspection	
• No fuels are to be permanently stored on the site during the Ploughing Phase.	FM / ECO	Ongoing	Site inspection	
• If required for use, the Applicant and/or Farm Manager must compile an inventory of all fertilizers to be used and must ensure that they know the effects of these substances on their staff and the environment. A copy of this inventory must be supplied to the Applicant and ECO.	FM / ECO	As additional hazardous substances are required	Review of inventory	
• If required for use, the Applicant and/or Farm Manager must ensure that the quantities of fertilizer stored on site are appropriate for their requirements, and must also ensure that they are appropriately stored and handled so as to minimise the risk of spills.	FM / ECO	Ongoing	Site inspection	
• Fertilizer storage areas must be bunded with an impermeable liner to protect water quality. An impermeable surface could be created by i) placing a layer of clay beneath plastic sheeting or ii) placing soil on top of plastic sheeting. When the impermeable surface is no longer required, the plastic sheet along with the contaminated soil must be disposed of off-site at a permitted landfill.	FM / ECO	Ongoing	Site inspection	
• Any pollution problems arising from the activity must be addressed immediately by the Applicant / Farm Manager.	Applicant / FM / ECO			
• The accidental or negligent spillage of any fuels or potentially hazardous substances must be cleaned up immediately using the most appropriate methods, equipment and materials.	FM / ECO	When necessary	Site inspection	

• The Farm Manager must ensure that the necessary materials, equipment and chemicals are available on the site to deal with spills of any of the hazardous materials present (e.g. Drizit, Zorbit).	FM / ECO	During site establishment	Site inspection	
• The Farm Manager must devise a procedure for dealing with accidental spills that must be approved by the ECO. This must include the following: – Stop the source of the spill; – Contain the spill; – All significant spills must be reported to the Department of Water Affairs (DWA); – Remove the spilled product and contaminated soils for treatment or authorised disposal; – Determine if there is any soil, groundwater or other environmental impact; – If necessary, remedial actions must be taken in consultation with the DWA; and – The incident must be documented in the Environmental Incidents Register.	FM / ECO	Prior to moving onto site	Review of procedures and poster	
• The Farm Manager must provide an Environmental Incident Record Book on site to record the details of any environmental incidents (date, time, cause, action taken). This book will be regularly checked by the ECO who will also cross reference the entries with observations made during site visits.	ECO	Prior to moving onto site / Ongoing	Review of Incident Record Book	
EQUIPMENT / MACHINERY	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The Farm Manager must store all equipment that may leak on an impermeable surface, with watertight drip trays to catch any pollutants.	ECO	Ongoing	Site inspection	
• The drip trays must be cleaned regularly, and must not be allowed to overflow.	FM / ECO	Ongoing	Site inspection	
• Chemicals collected in the drip trays must be collected and disposed of in an appropriate manner according to the relevant MSDS.	FM / ECO	Ongoing	Site inspection	
PERSONAL SAFETY	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The following personnel are required to wear hard hats: – All persons within 10m of any situation where any form of lifting or hoisting equipment is being undertaken; – Any personnel working in any other situation where possibility of head injury is present.	FM / ECO	Ongoing	Inspection of PPE	
• Protective gloves are to be worn by all persons engaging in the following: – Handling of heavy or sharp edged materials; – Welding or gas cutting activities; – Handling of corrosive chemicals.	FM / ECO	Ongoing	Inspection of PPE	
• All persons entering the site must wear approved safety boots.	FM / ECO	Ongoing	Inspection of PPE	
• The following persons must wear appropriate safety goggles and dust masks at all times: – Persons operating equipment under dusty conditions; – Persons handling hazardous chemicals. – Persons applying herbicide.	FM / ECO	Ongoing	Inspection of PPE	

HERITAGE IMPACTS	RESPONSIBILITY	OCCURRENCE	METHOD	✓ / ×
• Although the site is not likely to feature any heritage impacts, in the event that archaeological or heritage material being uncovered during ploughing, all ploughing must be immediately stopped and Amafa KZN must be contacted on 033 – 394 6543.	FM / ECO	Ongoing	Site inspection	
NOISE IMPACTS	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Ploughing activities must be limited to working hours between 7am and 5pm.	FM / ECO	Prior to moving onto site	Site inspection	
• Machinery and equipment must be maintained and regularly serviced to ensure that unnecessary noise is prevented.	FM / ECO	Ongoing	Site inspection	
• Workers on site must not create unnecessary noise such as hooting or shouting.	FM / ECO	Ongoing	Site inspection	
• Equipment fitted with noise reduction facilities will be used as per operating instructions and maintained properly during operations.	FM / ECO	Ongoing	Site inspection	
STAFF CONDUCT	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The Applicant and/or Farm Manager must monitor the performance of farm workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary, the ECO and / or a translator is to be called onto site to further explain aspects of environmental or social behaviour that are unclear.	FM / ECO	Ongoing	Site inspection; liaison with Farm Manager	
• A general regard for the social and ecological well being of the site and surrounding areas is expected of the site staff. Workers need to be made aware of the following rules: – Prevent excessive noise; – Ploughing staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives; – Trespassing on private / commercial properties adjoining the site is prohibited; and – Driving under the influence of alcohol is prohibited.	FM / ECO	Ongoing	Site inspection and liaison with labour	
DAMAGE TO PROPERTY AND STRUCTURES	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Damage to structures and fences on private property must be avoided as far as possible.	FM	Ongoing	Site inspection	
• Should damage to the aforementioned occur, the Applicant will be responsible for repairing the damage caused or compensating the property owner accordingly.	FM / Applicant	Ongoing	-	
COMMUNICATION WITH IAPs	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• The Applicant, Farm Manager and ECO are responsible for ongoing communication with all IAPs.	Applicant / FM / ECO	Ongoing	Liaison with FM & Applicant	
• A complaints register is to be located at the farm office / workshop. The Applicant and/or Farm Manager must account for any missing pages. This register is to be tabled during regular site meetings.	FM / ECO	Monthly	Review of Complaints Register	
• Queries and complaints are to be handled by: – Documenting details of such communications;	Applicant / FM / ECO	Ongoing	Review of Complaints	

– Submitting these for inclusion into the Complaints Register; – Bringing issues to the immediate attention of the Applicant / Farm Manager / ECO; and – Taking remedial action as per the Applicant and / or ECO's instructions.			Register	
• Should the farm staff be approached by members of the public or other stakeholders, they are to assist them in locating the Farm Manager.	FM	Ongoing	-	
• Should the ploughing staff be approached by members of the public or other stakeholders, they are to assist them in locating the Applicant and/or Farm Manager.	FM	Ongoing	-	
• The Applicant and/or Farm Manager are to inform surrounding residents and businesses of disruptive activities at least 24 hours in advance.	Applicant / FM / ECO	At least 24 hours prior to the activity occurring	Liaison with neighbours	
FIRE PROTECTION	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• As required by law (National Veld and Forest Fire Act, No 101 of 1998), firebreaks must be maintained on the property boundaries.	FM / ECO	Ongoing	Site inspection	

Additional Notes:

8 POST-PLOUGHING AND REHABILITATION

Site rehabilitation is an essential component of this EMPr and must be carried out in conjunction with the ECO. The guideline is to be used as the basic structure for the site rehabilitation; the specific details must be decided by the Applicant and / or Farm Manager in conjunction with the ECO. This applies most specifically to the soil replacement and re-vegetation components.

The requirements for the control of soil, water, dust and noise pollution stipulated in this EMPr still applies during the site Rehabilitation Phase of the project. Similarly, the requirements for soil management, erosion control, alien vegetation removal and vegetation and fauna protection also apply.

POST-PLOUGHING PHASE				
WASTE	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• All leftover ploughing materials are to be removed from the sites and either sold, auctioned, donated to the local community or transferred to the farm office / workshop.	FM / ECO	On completion of the project	Site inspection	
• All ploughing debris, litter and domestic waste is to be removed from the site and transferred to an appropriate disposal site. Remove all waste receptacles and either donate to the local community, auction, or transfer to farm office / workshop.	FM / ECO	On completion of the project	Site inspection	
• Waste may not be burnt or buried at the ploughing site – all waste is to be transferred to a permitted disposal site.	FM / ECO	On completion of the project	-	
ALIEN VEGETATION	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Existing and newly established alien vegetation must be removed from the ploughing site, surrounding areas and access roads and replaced, where necessary, with suitable indigenous / endemic plant species (see Section 10 for alien vegetation removal methods). During this process, it is imperative that indigenous vegetation is not removed or disturbed and soil disturbance is kept to a minimum.	FM / ECO	Ongoing	Site inspection	
• Alien plants that have been removed must be discarded at an appropriate refuse site. Should alien vegetation have seeds, it should be transferred to the storage area where it can be burned in a controlled manner, with care taken not to disperse the seeds.	FM/ ECO	When required	Site inspection	
• Only indigenous species should be used as replacement plants. No exotic plants are to be introduced to the site.	FM / ECO	Ongoing	Site inspection	
SOIL EROSION	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• To reduce the possibility of soil erosion, replanting of indigenous species must take place soon after alien vegetation has been removed.	FM / ECO	Ongoing	Site inspection	
• Unconfined surface flow must be contained to avoid soil erosion and contamination of water resources.	FM/ECO	Ongoing	Site inspection	
• Should soil erosion be noted on site, suitable erosion control methods must be implemented. This may include the following:	FM / ECO	If necessary	Site inspection	

• Biomatting may be installed to trap sediments; • Hessian sheeting may also be utilised to trap sediments; and • Rock-walls / bolsters may be established to attenuate the flow of water and trap sediments.				

Additional Notes:

9 OPERATIONAL PHASE

At the commencement of the Operational Phase, the ECO must audit the facility using the following EMPr. It is usual for this auditing to take place once a month for the first six months, proceeding to once every three months, then once every six months. However, the frequency of these audits will need to be determined by the DAEA. The following EMPr stipulations should be adhered to at all times during the operational phase.

In the tables that follow the following abbreviations are applicable: Environmental Control Officer (ECO) and Farm Manager (FM).

OPERATIONAL PHASE				
STORMWATER MANAGEMENT	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• Stormwater must be dispersed so as to avoid channelling and erosion.	FM / ECO	On completion of the project	Site inspection	
ALIEN VEGETATION CONTROL	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• All weeds and alien vegetation within and alongside the ploughed area, as well as on and alongside all access roads, need to be controlled and prevented from spreading.	FM / ECO	On completion of the project	Site inspection	
• Acceptable alien vegetation control methods include herbicide application and pulling and cutting prior to the plants going to seed.	FM / ECO	On completion of the project	Site inspection	
• Side weeding around the site must take place after each harvest.	FM / ECO	On completion of the project	-	
ENVIRONMENTAL FOOTPRINT	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
• It is imperative that the size and environmental footprint of the ploughed area does not expand over time. Markers should remain on all corners of the ploughed area to ensure this does not happen.	FM / ECO	Ongoing	Site inspection	
HARVESTING AND FERTLIZER APPLICATION	**RESPONSIBILITY**	**OCCURRENCE**	**METHOD**	**✓ / ×**
Should fertilizer be required: • Care must be taken to ensure that fertilizer is applied in the correct quantities; • Top dressing with fertilizer should not be conducted until the site is well vegetated to reduce the surface run-off during rainfall events; • Fertiliser must be spread across the site evenly; and • Where possible, fertilizer should not be applied prior to forecasted large rainfall events.	FM / ECO	Ongoing	Inspection of fertilizer application guides / Site inspection	
• Tractors and other machinery used during harvesting must be in good working order with no oil leaks.	FM / ECO	Ongoing	Site inspection	

• Tractors and other machinery must not deviate from the established access road and tracks during ploughing and harvesting to prevent compaction of the adjacent grassland soils.	FM / ECO	Ongoing	Site inspection	

Additional Notes:

10 ALIEN VEGETATION REMOVAL AND REHABILITATION PLAN

10.1 RELEVANT LEGISLATION

The Conservation of Agricultural Resources Act (CARA, Act 43 of 1983) stipulates the species (a current total of 198) that are considered alien invaders and classifies them according to three categories:

- Category 1: Plant species that may not be grown and must be eradicated.
- Category 2: Plant species with commercial or utility value that may only be grown with a permit under controlled circumstances.
- Category 3: Plant species that have amenity value and that may be grown, but not planted, propagated, imported or traded.

Amended Regulation 15 of the CARA stipulates that Category 1 plants (Declared Weeds) will no longer be tolerated in South Africa and must be removed. Bugweed (*Solanum mauritianum*) and Indian Shot (*Canna indica*) are both examples of Category 1 species in terms of the CARA. If these species are not controlled, they will multiply and become established over a greater area. This can lead to the displacement of indigenous plant species in the surrounding area. Gum trees (*Eucalyptus* sp.) are an example of a Category 2 species in terms of the CARA.

10.2 REMOVAL METHODS

In keeping with these requirements, the Department of Water Affairs (DWA), in their Working for Water programme recommends the following regarding alien invasive species:

Any control programme for alien vegetation must include the following 3 phases:

- Initial control: drastic reduction of existing population
- Follow-up control: control of seedlings, root suckers and coppice growth
- Maintenance control: sustain low alien plant numbers with annual control

Management Treatment Guidelines for some specific alien species likely to be problematic on site are included as Appendix C, and on the Working for Water website (www.dwaf.gov.za/wfw/Control). Further information and removal methods for other species can be found on this website.

10.3 REHABILITATION PLAN

Should the ploughed area ever be decommissioned, the control of alien vegetation within and around the decommissioned ploughed area is essential. This should be done using methods that least disturb the soil, such as cut stump and pulling of species with small root systems. Harvesting of the *Eragrostis* would cease and a burning regime suitable to the veld type should be introduced. To decrease the basal cover slightly to open up opportunities for indigenous flowers and grasses to establish, hot burns should be conducted for two consecutive years. Such a treatment would create conditions under which the blanket of *Eragrostis* would not thrive as it does when being mowed for baling. It will be imperative to ensure that only indigenous species

establish in the gaps created by the hot burns. Local indigenous seed should transfer onto the site naturally, but this could be accelerated by collecting seed through the wet summer months and manually dispersing it through the sites.

An alternative treatment may need to be applied if drought has been experienced in the year(s) leading up to the decommissioning, in which case intense burns should be avoided and the establishment of a greater diversity of plant and grass species on the decommissioned site should be the focus of the rehabilitation operation using manual seed dispersal as indicated above.

Should the decommissioned site not respond satisfactorily to the recommended treatment, soil samples should be collected from the decommissioned site and a nearby undisturbed site for comparison. If soil nutrient deficiencies are revealed, suitable organic compost should be used applied in a conservative manner.

10.4 VEGETATION MANAGEMENT PLAN

The ploughing of indigenous grassland for the establishment of *Eragrostics curvula* pasture will result in the soils being exposed initially, until such time as the vegetation has become established. Although the climatic conditions in this area do not encourage prolific alien vegetation growth, during this time, it is essential to ensure that alien vegetation does not become established on the disturbed soils. It is recommended that weekly inspections of the site are made and any weeds / alien vegetation noted are removed by hand-pulling.

The following activities must be undertaken to ensure the ongoing removal of alien vegetation from the site:

- Performance Indicators: Introduction of 'new' invasive species must be prohibited and the spread of existing weeds must be minimised. Indigenous plant species must be assessed for their successful establishment.
- Monitoring and Reporting: Visual site assessment. This is to be done initially by the ECO during the Ploughing Phase, then by the Farm Manager and Applicant during Operation.
- Corrective Action: Education of ploughing and other farm staff with regard to spread and maintenance of alien plants. Ongoing implementation of alien plant removal methods is to be done, as described above and followed up with re-vegetation using indigenous species. The plants in the rehabilitated areas must be monitored to ensure that they have rooted effectively and are growing well.

Care must be taken to ensure that the fertilizer is confined to the pasture area. Soil erosion methods as detailed above must be implemented.

10 CONCLUSION

In terms of NEMA, everyone is required to take reasonable measures to ensure that they do not pollute the environment. Reasonable measures include informing and educating employees about the environmental risks of their work and training them to operate in an environmentally responsible manner. Furthermore, in terms of NEMA, the cost to repair any environmental damage shall be borne by the person responsible for the damage.

If the above-mentioned management recommendations are adopted, it is anticipated that most of the negative environmental impacts associated with the Pre-Ploughing, Ploughing, Post-Ploughing and Rehabilitation, and Operational Phases of the activity can be mitigated against. An appointed ECO will need to regularly monitor the site to ensure that the required environmental controls are in place and working effectively.

11 APPENDICES

APPENDIX A: COMPLAINTS REGISTER

The following table must be completed for each reported complaint. All complaints received must be investigated and a response (even if pending further investigation) is to be given to the complainant within 7 days. Add pages as necessary.

Time & Date	Contact Details of Complainant	Nature of Complaint	Response & Investigation Undertaken	Actions Taken & by Whom

APPENDIX B: ENVIRONMENTAL INCIDENT REPORTING

All environmental incidents occurring on the site must be recorded in the following table. Add pages as necessary.

Time & Date	Location & Nature of Incident	Action Taken & by Whom

APPENDIX C: MANAGEMENT TREATMENTS SUMMARY GUIDE - Terrestrials				
TREATMENT DETAIL				
Species	**Category**	**Size class**	**Treatment**	**Herbicide**
Bramble - American, European black berry (*Rubus cuneifolius*)	1	All	Foliar spray, Slash and spray regrowth	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr / picloram 80 / 80 g/L ME *Plenum 160 ME (L7702)*
				glyphosate (isopropylamine) 360 g/L SL *Glyph 360 SL (L4767), Mamba 360 SL (L4817), Roundup 360 SL (L407), Springbok 360 SL (L6719)*
				glyphosate (potassium) 500 g/L SL *Touchdown Forte Hitech 500 SL adjuvant incl.(L7305)*
				metsulfuron-methyl 500g/kg WG *Nicanor 50 WP (L6583)*
				metsulfuron-methyl 600g/kg WG *Brush-Off 600 WG (L4535), Climax 600 SG (L6867)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920), Browser 240 SL (L7357)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920), Browser 240 SL (L7357)*
				triclopyr (butoxy ethyl ester) 240 g/L EC *Ranger 240 EC adjuvant incl. (L6179)*
				triclopyr (butoxy ethyl ester) 480 g/L EC *Garlon 480 EC (L4916), Triclon EC (L6661), Viroaxe EC (L6663)*
				triclopyr (butoxy ethyl ester) 480 g/L EC *Garlon 4 (L3249)*
Bugweed (*Solanum mauritianum*)	1	Seedling <1m	Hand pull ***NB: keep roots off the ground***	None
		Seedling 0.5 to 1m and Coppice	Foliar spray	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr 200 g/L EC *Starane 200 EC (L4918), Tomahawk 200 EC (L6652), Voloxypyr 200 EC (7776)*
				fluroxypyr / picloram 80 / 80 g/L ME *Plenum 160 ME (L7702)*
				glyphosate (ammonium) 680 g/kg WG *Roundup Max 680 WG (L6790)*
				glyphosate (isopropylamine) 240 g/L SL *Tumbleweed 240 SL (L4781)*
				glyphosate (isopropylamine) 360 g/L SL *Glyph 360 SL (L4767), Mamba 360 SL (L4817), Roundup 360 SL (L407), Springbok 360 SL (L6719)*
				glyphosate (isopropylamine) 450 g/L SL *RoundUp Turbo 450 SL (L7166)*
				glyphosate (isopropylamine) 480 g/L SL *Mamba Max 480 SL (L7714)*
				glyphosate (potassium) 500 g/L SL *Touchdown Forte Hitech 500 SL adjuvant incl.(L7305)*
				glyphosate (sodium) 500 g/kg WG *Kilo 500 WSG (L7431)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444) Hatchet 100 SL (L7409)*
				triclopyr (butoxy ethyl ester) 240 g/L EC *Ranger 240 EC adjuvant incl. (L6179)*
				triclopyr (butoxy ethyl ester) 480 g/L EC *Garlon 4 EC (L3249) & 480 EC (L4916), Triclon EC (L6661), Viroaxe EC (L6663)*
		Mature	Cut stump ***NB: for trial, not registered***	**glyphosate (ammonium) 680 g/kg WG** *Roundup Max 680 WG (L6790)*

			Cut stump/frill	**glyphosate (isopropylamine) 480 g/L SL** *Mamba Max 480 SL (L7714)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444) Hatchet 100 SL (L7409)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920), Browser 240 SL (L7357)*
				triclopyr (-amine salt) 360 g/L SL *Lumberjack 360 SL (L7295), Timbrel 360 SL (L4917)*
Caster-oil plant (*Ricinus communis)*		All	Cut stump / Frill	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr / picloram 80 / 80 g/L ME *Plenum 160 ME (L7702)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
				triclopyr (-amine salt) 360 g/L SL *Timbrel 360 SL (L4917)*
Gums - Saligna Gum (*Euc. grandis*)	2	Seedlings	Hand pull	None
		Seedlings, saplings and coppice	Foliar spray	**fluroxypyr / picloram 80 / 80 g/L ME** *Plenum 160 ME (L7702)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
				metsulfuron-methyl 500g/kg WG *Nicanor 50 WP (L6583)*
				metsulfuron-methyl 600g/kg WG *Brush-Off 600 WG (L4535), Climax 600 SG (L6867)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920)*
				triclopyr (butoxy ethyl ester) 240 g/L EC *Ranger 240 EC adjuvant incl. (L6179)*
				triclopyr (butoxy ethyl ester) 480 g/L EC *Garlon 4 EC (L3249) & 480 EC (L4916), Triclon EC (L6661), Viroaxe EC (L6663)*
		Mature plants	Cut stump	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr / picloram 80 / 80 g/L ME *Plenum 160 ME (L7702)*
				glyphosate (ammonium) 680 g/kg WG *Roundup Max 680 WG (L6790)*
				glyphosate (isopropylamine) 360 g/L SL *Glyph 360 SL (L4767), Mamba 360 SL (L4817), Roundup 360 SL (L407), Springbok 360 SL (L6719)*
				glyphosate (isopropylamine) 450 g/L SL *RoundUp Turbo 450 SL (L7166)*
				glyphosate (potassium) 500 g/L SL *Touchdown Forte Hitech 500 SL adjuvant incl.(L7305)*
				glyphosate (sodium) 500 g/kg WG *Kilo 500 WSG (L7431)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
				metsulfuron-methyl 500g/kg WG *Nicanor 50 WP (L6583)*
				metsulfuron-methyl 600g/kg WG *Brush-Off 600 WG (L4535), Climax 600 SG (L6867)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920), Browser 240 SL (L7357)*
				triclopyr (butoxy ethyl ester) 240 g/L EC *Ranger 240 EC adjuvant incl. (L6179)*
				triclopyr (-amine salt) 360 g/L SL *Lumberjack 360 SL (L7295), Timbrel 360 SL (L4917)*
			Frill	**picloram (potassium salt) 240 g/L SL** *Access 240 SL (L4920), Browser 240 SL (L7357)*
				triclopyr (-amine salt) 360 g/L SL *Lumberjack*

				360 SL (L7295), Timbrel 360 SL (L4917)
Jacaranda (*Jacaranda mimosifolia*)	3	Seedlings	Hand pull	None
		All	Cut stump / Frill	**imazapyr 100 g/L SL** *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
Lantana, Tickberry (*Lantana camara*)	1	All	Foliar spray	**fluroxypyr / picloram 80 / 80 g/L ME** *Plenum 160 ME (L7702)*
				glyphosate (ammonium) 680 g/kg WG *Roundup Max 680 WG (L6790)*
				glyphosate (isopropylamine) 240 g/L SL *Tumbleweed 240 SL (L4781)*
				glyphosate (isopropylamine) 360 g/L SL *Glyph 360 SL (L4767), Mamba 360 SL (L4817), Roundup 360 SL (L407), Springbok 360 SL (L6719)*
				glyphosate (isopropylamine) 450 g/L SL *RoundUp Turbo 450 SL (L7166)*
				glyphosate (isopropylamine) 480 g/L SL *Mamba Max 480 SL (L7714)*
				glyphosate (potassium) 500 g/L SL *Touchdown Forte Hitech 500 SL adjuvant incl.(L7305)*
				glyphosate (sodium) 500 g/kg WG *Kilo 500 WSG (L7431)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920), Browser 240 SL (L7357)*
			Cut stump / Frill	**fluroxypyr / picloram 80 / 80 g/L ME** *Plenum 160 ME (L7702)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920), Browser 240 SL (L7357)*
Mulberry (*Morus* spp.)	3	Seedlings	Hand pull	None
		Coppice & Mature / Adult	Cut stump / Frill ***NB: for trial, not registered***	**imazapyr 100 g/L SL** *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
Peanut butter tree (*Senna didymobotrya*)	3	Seedlings	Hand pull	None
		All	Cut stump / Frill ***NB: for trial, not registered***	**imazapyr 100 g/L SL** *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
Pepper tree, Brazilian (*Schinus terebinthifolius*)	1	Seedlings	Hand pull	None
		All	Cut stump / Frill ***NB: for trial, not registered***	**triclopyr (-amine salt) 360 g/L SL** *Lumberjack 360 SL (L7295), Timbrel 360 SL (L4917)*
Scotch Thistle (*Circium vulgare*)	1	All	Foliar	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr / picloram 80 / 80 g/L ME *Plenum 160 ME (L7702)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920)*
Syringa (*Melia azedarach*)	3	Seedlings	Hand pull	None
		Adult	Cut stump / Frill	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr / picloram 80 / 80 g/L ME *Plenum 160 ME (L7702)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920)*
				triclopyr (-amine salt) 360 g/L SL *Timbrel 360 SL (L4917)*

Wattle, Black (*Acacia mearnsii)*	2	Seedlings	Hand pull	None
		Seedlings and up to 1 m tall	Foliar spray	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr 200 g/L EC *Starane 200 EC (L4918), Tomahawk 200 EC (L6652), Voloxypyr 200 EC (7776)*
				glyphosate (ammonium) 680 g/kg WG *Roundup Max 680 WG (L6790)*
				glyphosate (isopropylamine) 240 g/L SL *Tumbleweed 240 SL (L4781)*
				glyphosate (isopropylamine) 360 g/L SL *Glyph 360 SL (L4767), Mamba 360 SL (L4817), Roundup 360 SL (L407), Springbok 360 SL (L6719)*
				glyphosate (isopropylamine) 450 g/L SL *RoundUp Turbo 450 SL (L7166)*
				glyphosate (isopropylamine) 480 g/L SL *Mamba Max 480 SL (L7714)*
				glyphosate (sodium) 500 g/kg WG *Kilo 500 WSG (L7431)*
				triclopyr (butoxy ethyl ester) 240 g/L EC *Ranger 240 EC adjuvant incl. (L6179)*
				triclopyr (butoxy ethyl ester) 480 g/L EC *Garlon 4 EC (L3249) & 480 EC (L4916), Triclon EC (L6661), Viroaxe EC (L6663)*
		Up to 2m tall & Coppice	Spot spray	**clopyralid / triclopyr (-amine salt) 90 / 270 g/L SL** *Confront 360 SL (L7314)*
				fluroxypyr / picloram 80 / 80 g/L ME *Plenum 160 ME (L7702)*
				glyphosate (isopropylamine) 240 g/L SL *Tumbleweed 240 SL (L4781)*
				glyphosate (potassium) 500 g/L SL *Touchdown Forte Hitech 500 SL adjuvant incl.(L7305)*
				triclopyr (butoxy ethyl ester) 240 g/L EC *Ranger 240 EC adjuvant incl. (L6179)*
				triclopyr (butoxy ethyl ester) 480 g/L EC *Garlon 4 EC (L3249) & 480 EC (L4916), Triclon EC (L6661), Viroaxe EC (L6663)*
		Mature	Bark strip	None
			Cut stump	**fluroxypyr / picloram 80 / 80 g/L ME** *Plenum 160 ME (L7702)*
				imazapyr 100 g/L SL *Chopper 100 SL (L3444), Hatchet 100 SL (L7409)*
				picloram (potassium salt) 240 g/L SL *Access 240 SL (L4920), Browser 240 SL (L7357)*
				triclopyr (-amine salt) 360 g/L SL *Lumberjack 360 SL (L7295), Timbrel 360 SL (L4917)*
			Frill	**picloram (potassium salt) 240 g/L SL** *Access 240 SL (L4920), Browser 240 SL (L7357)*

SOURCE: DWAF's Management Treatment Summary Guide for Terrestrial Alien Invasive Plant Species (www.dwaf.gov.za/wfw/Control)