edtea
Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

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EIA File Reference Number:	DC/
NEAS Reference Number:	KZN/EIA/
Waste Management Licence Number: (if applicable)	
Date Received:	

DRAFT BASIC ASSESSMENT REPORT

Submitted in terms of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

Proposed breaking of less than 100 hectares of virgin land for grain production

on Portion 10 of the Farm Kopleegte No 1154 near Colenso
in the Okhahlamba Local Municipality within the uThukela District

DC 23/0021/2014

This template may be used for the following applications:

- **Environmental Authorization** subject to basic assessment for an activity that is listed in Listing Notices 1or 3, 2010 (Government Notices No. R 544 or No. R 546 dated 18 June 2010); or
- **Waste Management Licence** for an activity that is listed in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for which a basic assessment process as stipulated in the EIA Regulations must be conducted as part of the application (refer to the schedule of waste management activities in Category A of Government Notice No. 718 dated 03 July 2009).

Kindly note that:

1. This **basic assessment report** meets the requirements of the EIA Regulations, 2010 and is meant to streamline applications. This report is the format prescribed by the KZN Department of Economic Development, Tourism & Environmental Affairs. Please make sure that this is the latest version.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with text.
3. Where required, place a cross in the box you select.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it will result in the rejection of the application as provided for in the regulations.
6. No faxed or e-mailed reports will be accepted.
7. The report must be compiled by an independent environmental assessment practitioner ("EAP").
8. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
9. The KZN Department of Economic Development, Tourism & Environmental Affairs may require that for specified types of activities in defined situations only parts of this report need to be completed.
10. The EAP must submit this basic assessment report for comment to all relevant State departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (2) of the National Environmental Management Act 1998 (Act 107 of 1998) and such comments must be submitted within 40 days of such a request.
11. **Please note that this report must be handed in or posted to the District Office of the KZN Department of Economic Development, Tourism & Environmental Affairs to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).**

DEPARTMENTAL REFERENCE NUMBER(S)

File reference number (EIA):	DC23/0021/2014
File reference number (Waste Management Licence):	

SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	Susan Carter-Brown, NatureStamp		
Physical address:	5 Seeking Drive, Hilton		
Postal address:	PO Box 949, Hilton		
Postal code:	3245	**Cell:**	083 289 4912
Telephone:	033 343 2049	**Fax:**	086 776 4789
E-mail:	susan@naturestamp.co.za		

2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
N / A			

3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Education qualifications	Field of expertise	Section/ s contributed to in this basic assessment report	Title of specialist report/ s as attached in Appendix D
Frans Prins *Active Heritage cc*	MA (Archaeology)	Heritage Assessments, Archaeology	Heritage Assessment	Appendix D4
Gavin Anderson *Umlando: Archaeological Surveys and Heritage Management*	MA (Archaeology)	Heritage Assessments, Archaeology	Heritage Assessment	Appendix D4
Lauren Booth and Andrew Booth *UmfulaECO*	Lauren Booth BSc. Honours (Ecology), MSc. Ecology Andrew Booth BSc. Honours (Grassland Science); IAIAsa	Vegetation Assessment, ECO work	Vegetation Assessment	Appendix D3

Jake Alletson *Terratest*	BSc Biological Sciences. BSc (Hons) Zoology	Specialist Ecological, Biodiversity and Wetland Assessments	Wetland Assessment Report	Appendix D2
Bruce Scott-Shaw *NatureStamp*	MSc Hydrology	Watercourse Assessments, Modelling, Floodlines	Soils Assessment	Appendix D1

ACRONYMS

BAR	Basic Assessment Report
BID	Background Information Document
BPA	Biodiversity Priority Area
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs
DWS	Department of Water and Sanitation
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
GA	General Authorization
HIA	Heritage Impact Assessment
HGM	Hydrogeomorphic
IAP	Interested and Affected Party
IDP	Integrated Development Plan
IWULA	Integrated Water Use License Application
NEMA	National Environmental Management Act (No. 107 of 1998)
NEMWA	National Environmental Management Waste Act (No 59 of 2008) -
NFEPA	National Freshwater Ecosystems Priority Areas
NSDP	National Spatial Development Perspective
NWA	National Water Act (No. 36 of 1998)
PES	Present Ecological State (referring to wetland heath)
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
WESSA	Wildlife and Environment Society of South Africa
WUL	Water Use License
WULA	Water Use License Application

SECTION B: ACTIVITY INFORMATION

1. PROJECT TITLE

Describe the project title as provided on the application form for environmental authorization:

The proposed breaking of less than 100 hectares of virgin land for grain production on Portion 10 of the Farm Kopleegte No 1154 near Colenso, in the Okhahlamba Local Municipality within the uThukela District.

2. PROJECT DESCRIPTION

Provide a detailed description of the project:

1. Background of the area

The Kopleegte site (as depicted by the locality map in Appendix A1) is surrounded by untransformed veld interspersed with agriculture to the north and east, and by agriculture to the west of the N3 freeway. To the south, the landscape is undisturbed. Kopleegte Farm and the surrounds has an interesting cultural history.

The San were the owners of the land for almost 30 000 years before the local demography started to change after the first Bantu-speaking farmers crossed the Limpopo River and arrived in South Africa about 2000 years ago. Around 800 years ago, if not earlier, Bantu-speaking farmers settled in the greater Estcourt area. The Later Iron Age sites of the Bergville-Colenso area were most probably inhabited by Nguni-speaking groups such as the amaBhele and related groups. However, by 1820 the amaBhele was dispersed from region due to the expansionistic policies of the Zulu Kingdom of King Shaka. African refugee groups, such as the amaHlubi, and other individuals were given permission to settle in the area by the British colonial authorities after 1845. After the Anglo-Zulu war of 1879 and the Bambatha Rebellion of 1911, many of the African people in the study area adopted a Zulu ethnic identity.

European settlement of the area started soon after 1838 when the first Voortrekker settlers marked out large farms. Various sites in Colenso and Bergville belong to the Voortrekker era, especially former laagers such as Veglaager – now covered by the waters of Wagendrift Dam and Blaawkranz (Bloukrans). On the night of 16 February 1838, a Voortrekker Laarger situated at Blaawkranz was attacked by Zulu warriors and 96 adults, 185 children and about 200 servants were killed by a Zulu force that also seized about 25 000 head of cattle. In the days following the attack the Voortrekkers buried their dead in a mass grave near the Great Moordspruit River. In 1895, the bodies were exhumed and reburied under the Bloukrans monument at the site of the battle.

Despite early Voortrekker settlement, the majority of older buildings on farmsteads in the area were erected by British colonists after 1850 who occupied farms previously inhabited by Voortrekker pioneers. Fort Durnford, for instance, was built in the 1870's to combat San raids from the Drakensberg. Anglo-Boer War activities also took place in the area, especially in the environs of Colenso, and the most southern skirmish between Boer and Brit in Natal took place at Willow Grange to the immediate south of Estcourt. The capture site of the young Winston Churchill occurs about 2km to the south of Kopleegte Farm (Active Heritage, 2015).

Kopleegte Farm also has a history of agriculture. The land currently under application was farmed by the early Bantu and Nguni farmers; the image below shows cultivation of the lands around the 1940s.

Aerial image of Kopleegte Farm: 1937-1938. Note the patchwork of cultivated areas (Umlando, 2015)

As well as cultivation for crop production, there would have been extensive grazing by livestock.

While Kopleegte can by no means be deemed pristine, the lands are defined as 'indigenous grassland' as no cultivation of in this portion has occurred within the last 10 years. Section 2 of GNR 983 (2014) states that – *"indigenous vegetation" refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years".*

The applicant has farmed Kopleegte for the past 11 years. He practices minimum tillage methods of Conservation Agriculture and has a commitment to environmental protection. This is evidenced through the applicant's establishment of a conservation area on the farm of 300 hectares (see the Farm Layout in Appendix A2). This area operates as a game farm and provides habitat for Wildebeest, Giraffe, Blesbok, Impala, Reedbuck and Duiker.

2. Kopleegte project proposal

It is proposed that 98.95 hectares of indigenous grassland be cultivated in order to produce commercial grain crops.

The applicant currently farms 60 hectares under irrigation to grow maize, wheat, oats and soya crops. This proposal would be to expand the commercial farming operation. As done elsewhere on the farm, the applicant would farm the land using minimum tillage Conservation Agriculture practices. Using this method, the first three steps of conventional cultivation are dispensed with. Planting is done through the residues of previous plantings and weeds with a devise that cuts a slot a few centimeters wide, followed by a device that inserts the seeds and fertilizer and then closes the trench – these devices all exist on one implement and can be carried out in a single tractor run. Impacts of minimum tillage include:

- Continuous basal cover of land with cultivated crops or cover crops
- Accumulation of thick humus mulch layer covering soil
- Reduced evaporation of moisture
- Increased infiltration of rain and irrigated water
- Reduced runoff (with reduced leaching of nitrogenous fertilizers)

- No soil losses through wind and water erosion
- Improved micro-biological properties of soil
- Reduced volatilization of organic matter
- Reduced carbon-footprint of cultivation activities
- Reduced compaction of soil profile
- Improved earthworm populations from maintenance of plant residues and cover cropping
- Improved incorporation of surface-applied lime
- Reduced fuel consumption as reduced runs with tractor
- Reduced vehicle emissions
- Less implements needed
- Reduced replacement costs of implements

Conversely, in conventional tillage, the earth is turned to a depth of 20 to 30 cm with a plough, most commonly one of the moldboard variety. Subsequently, the land is disked at least twice more to prepare the seedbed before planting takes place. Impacts of conventional tillage include:

- No basal cover of land for certain periods of the year
- Loss of soil moisture through evaporation
- Soil losses through wind and water erosion
- Loss of soil organic carbon through increased mechanical breakdown of soil profile
- Reduced micro-biological properties of soil
- Compaction of soil profile through numerous runs with tractor
- High usage of diesel from numerous runs with tractor, as well as wear&tear of several implements
- Increased replacement costs of equipment due to additional mechanical activities.

Thus, the environmental benefits of using minimum tillage methods on Kopleegte Farm would be significant. The applicant would also make use of precision agriculture technologies – such as soil moisture probes, and soil nutrient mapping for exact moisture and nutrient application on lands. Precision Agriculture helps crops be produced in an efficient, sustainable and low-impacting manner.

The lands proposed for cultivation would be irrigated by highly efficient pivot irrigation (see figures below). As the irrigation pivots work on a circular pattern, it is required that the irrigation arm crosses wetland/drainage line zones in order to complete a rotation. Small earthern embankments with culverts would be constructed to allow for the wheel of the pivot to move over these areas.

Centre motor of Pivot irrigation scheme, drives irrigations arms in a circular pattern

Centre Pivot irrigation arms moving in a circle

The radius of the pivot arm determines where the wheels are located and hence where watercourse crossings need to be constructed. The pivots (and hence areas of cultivation) have been strategically placed within the proposed site to create a layout that minimizes impacts on heritage, vegetation and wetland resources - see Appendix A4 for the proposed cultivation layout. The wetland crossings are low impact structures. The figure below illustrates this structure. It would be approximately 1.5m wide.

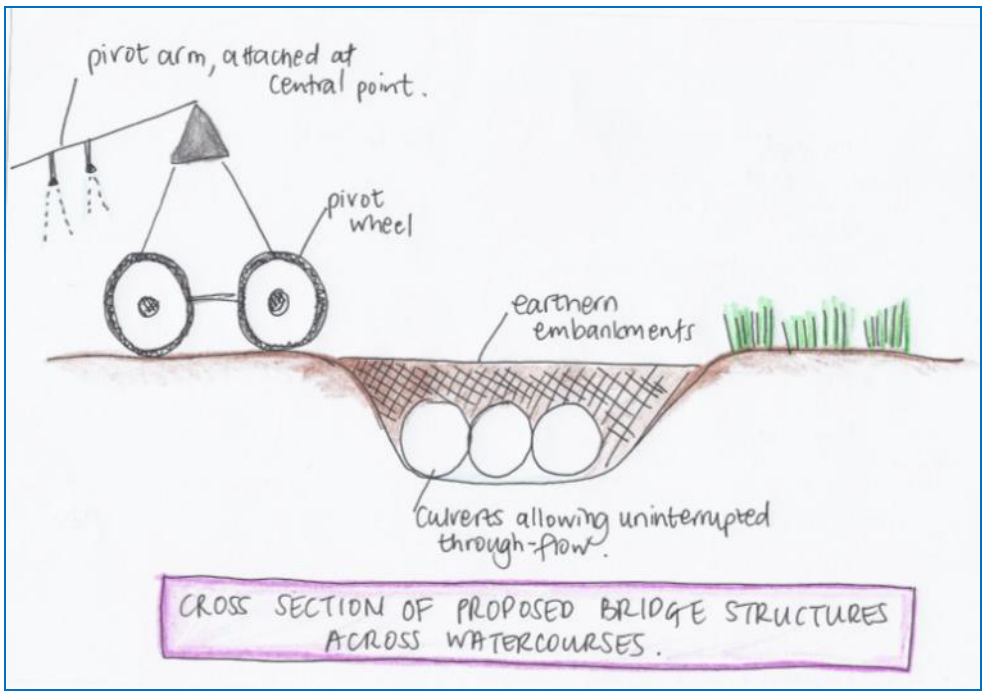


Image of cross section of proposed embankment crossing

Development of the project plan is an iterative process and takes into account all specialist findings (see Appendix A3 for examples of layout iterations). The irrigation pivots have been purposely placed in areas which would have the least impact of natural resources: portions where vegetation is degraded;

portions of the wetland that are highly disturbed and eroded; and avoiding/buffering heritage sites. For example, see photograph below of the degraded portions of the wetland that will be infilled and crossed by the pivot wheels –

Image of wetland area to be crossed by centre pivot irrigation

Thus, the proposed developments at Kopleegte include –

- Transformation of 98.95 hectares of indigenous grassland to cultivated fields in order to increase the production of grain crops.
- Erecting of 2-full and 1-half pivot irrigation schemes (98.95 hectares irrigated land) – see the proposed layout in Appendix A4.
- Development of low impact wetland crossings to allow movement of irrigation pivots over wetland areas.
- Infilling of some highly degraded and eroded wetland areas to stabilize system.
- No new development of roads.
- Changing some existing fence lines to accommodate new landuse pattern.

The project would increase the employment opportunities from the15 current positions on the farm to 23 fulltime positions while operational.

3. Mitigation of impacts

It is well recognized that the breaking of virgin grassland can be a contentious issue in environmental forums. The following potential impacts have been identified should the transformation of virgin grassland on Kopleegte Farm be approved –

- impact on heritage resources,
- impacts on water resources: i.e. wetland system running through the site, and
- impact on vegetation.

Accordingly, specialists have been appointed to further investigate the respective natural resources, and provide guidance on mitigation of impacts in order that any disturbances to the landscape are sensitively conducted.

The activity- and site-specific details are given later in this report, but an understanding of the broader production and farm-scale scale mitigation measures must be gained. These are detailed herewith –

i. Conservation of 300ha of KZN Highland Thornveld. This is an existing game farm area on the farm, comprising intact virgin grasslands and savannah habitats (see Appendix A2). The area is stocked with game and serves as an ecological corridor across the landscape. As a means of an offset for the loss of grasslands for cultivation, the applicant would like to explore opportunities for formal protection of this 300 ha game camp through the Biodiversity Stewardship Programme of EKZNW. The game camp would be actively managed to conservation standards with relevant conservation grazing and burning regimes.

ii. According to the Wetland Specialist report (Appendix D2), measures would be undertaken to rehabilitate and stabilize the large wetland system traversing the Kopleegte site.

iii. All production of grain crops would be under minimum tillage methods. Minimum-Till is a recognized practice of Conservation Agriculture with known environmental benefits. Furthermore, statistics show that yields under Minimum-Till farming are up to 14 tonnes per hectare, as opposed to 9 tonnes under conventional practices. Thus, production of grain on Kopleegte would be to the highest efficiency, using best environmental practice.

3. ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June2010), Listing Notice 3 (GNR 546, 18June 2010) or Category A of GN 718, 3 July 2009 (Waste Management Activities) which is being applied for as per the project description:

1. **The transformation of virgin grassland** for cultivation of grains, requires that EIA regulation: GNR 546 (14) be applied for, as stated –

(a) In Eastern Cape, Free State, KwaZulu-Natal, Gauteng, Limpopo, Mpumalanga, Northern Cape, Northwest and Western Cape -

i. All areas outside urban areas.

The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:

(1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;
(2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list;

the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010.

2. **The construction of small crossings to allow pivot irrigation to traverse wetland areas,** requires that EIA regulation GNR 544 (11)and (18) be applied for, as stated –

(11) *The construction of:*
(i) canals;
(ii) channels;
(iii) bridges;

(iv) dams;
(v) weirs;
(vi) bulk storm water outlet structures;
(vii) marinas;
(viii) jetties exceeding 50 square metres in size;
(ix) slipways exceeding 50 square metres in size;
(x) buildings exceeding 50 square metres in size; or
(xi) infrastructure or structures covering 50 square metres or more

where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

(18) *The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from:*

(i) a watercourse;
(ii) the sea;
(iii) the seashore;
(iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater -

but excluding where such infilling, depositing , dredging, excavation, removal or moving;

(a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or
(b) occurs behind the development setback line.

4. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;

Regarding an alternative property to undertake the activities:
The applicant owns Kopleegte Farm. It has moderate potential as a grain-producing unit due to its fairly productive soils, temperate climate, access to water, mildly undulating slopes and proximity to markets. Moreover, the land would form part of the grain production system with other portions of land owned and farmed by the applicant. This allows for streamlined management and sharing of resources across farms.

Thus, no other property is relevant and will henceforth not be considered.

Regarding the locations within the property boundary, where to undertake the activities:
The activities applied for under NEMA are outlined below, with appropriate explanations –

i. **Breaking of virgin grassland (GNR 546, 14)** –
Specialist studies have determined the presence of wetland, vegetation and heritage resources on the site. The positioning of the areas proposed for cultivation has been iterative and several options have already been explored – see the draft plans in Appendix A3.The final proposed cultivation configuration has been purposefully designed around natural resources, with the aim being to the minimize all impacts. The final proposed layout plan found in Appendix A4 is

deemed to be the best configuration – avoiding and minimizing impacts to natural resources as far as feasible.

ii. **Constructing wetland crossings (GNR 544, 18)** – the centre pivot irrigation systems turn on large wheels. The radius of the pivot arm determines where the wheels are located and hence where watercourse crossings need to be constructed. The pivots have been strategically placed to in area where wetlands are highly degraded.

Thus, no other locations would be appropriate and will henceforth not be considered.

(b) the type of activity to be undertaken;

Other farming enterprises which would not require the breaking of virgin land could be considered, such as beef and game production. However, the applicant is in the business of crop production as this is the most feasible agricultural enterprise for the environment, yielding the best returns on investment. The applicant has no interest for commercial beef or game production and thus this application is made specifically to transform land for crop production.

Thus, no other activity would be appropriate and will henceforth not be considered.

(c) the design or layout of the activity;

i. **Breaking of virgin grassland (GNR 546, 14)** –
Specialist studies have determined the presence of wetland, vegetation and heritage resources on the site. The positioning of the areas proposed for cultivation has been iterative and several options have already been explored – see the draft plans in Appendix A3.The final proposed cultivation configuration has been purposefully designed around natural resources, with the aim being to the minimize all impacts. The final proposed layout plan found in Appendix A4 is deemed to be the best configuration – avoiding and minimizing impacts to natural resources as far as feasible.

iii. **Constructing wetland crossings (GNR 544, 18)** – the centre pivot irrigation systems turn on large wheels. The radius of the pivot arm determines where the wheels are located and hence where watercourse crossings need to be constructed. The pivots have been strategically placed to in area where wetlands are highly degraded.

Thus, no other design / layout would be appropriate and will henceforth not be considered.

(d) the technology to be used in the activity;

i. **Breaking of virgin grassland (GNR 546, 14)** – proposed crop lands would be cultivated using Minimum-Till practices. Minimum-Till is a Conservation Agriculture method with proven environmental benefits. The applicant would also make use of precision agriculture technologies – such as soil moisture probes, and soil nutrient mapping - for exact moisture and nutrient application on lands. Precision Agriculture helps crops be produced in an efficient, sustainable and low-impacting manner.

ii. **Constructing wetland crossings (GNR 544, 18)** – Wetland crossings have been sensitively designed in collaboration with wetland specialists. It is the opinion of the EAP that the best wetland crossing design has been determined, rendering minimal impacts on the wetland systems and assisting to stabilize portions where the wetland is eroding.

Thus, no other technologies would be appropriate and will henceforth not be considered.

(e) the operational aspects of the activity; and

i. **Breaking of virgin grassland (GNR 546, 14)** – Once land has been broken, it would continue to be farmed under Minimum-Till Conservation Agriculture principles, where a continuous vegetative cover would be maintained.

ii. **Constructing wetland crossings (GNR 544, 18)** – Wetland crossings have been sensitively designed in collaboration with wetland specialists. It is the opinion of the EAP that the best wetland crossing design has been determined, allowing for a maintained basal flow through the system and rendering minimal impacts on the wetland systems. Strength and durability of materials used must be ensured. Ongoing maintenance and monitoring would be incorporated into the EMPr.

Thus, no other operational aspects would be appropriate and will henceforth not be considered.

(f) the option of not implementing the activity.

The No-Go Alternative will be assessed.

Describe alternatives that are considered in this report. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Sections B 5 – 15 below should be completed for each alternative.

5. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. List alternative sites were applicable.

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alternative S1[1] (preferred or only site alternative)	28 °	46 ‘	04.29“	29 °	41 ‘	07.08“
Alternative S2 (if any)	°	‘	“	°	‘	“
Alternative S3 (if any)	°	‘	“	°	‘	“

In the case of linear activities:

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alternative S1 (preferred or only route alternative)						
• Starting point of the activity	°	‘	“	°	‘	“
• Middle point of the activity	°	‘	“	°	‘	“
• End point of the activity	°	‘	“	°	‘	“
Alternative S2 (if any)			“			“

[1] “Alternative S..” refer to site alternatives.

• Starting point of the activity	o	‘	“	o	‘	“
• Middle point of the activity	o	‘	“	o	‘	“
• End point of the activity	o	‘	“	o	‘	“
Alternative S3 (if any)			“			“
• Starting point of the activity	o	‘	“	o	‘	“
• Middle point of the activity	o	‘	“	o	‘	“
• End point of the activity	o	‘	“	o	‘	“

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500m along the route for each alternative alignment.

6. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1[2] (preferred activity alternative)	98 9500 m²
Alternative A2 (if any)	
Alternative A3 (if any)	
or, for linear activities:	
Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	m
Alternative A2 (if any)	m
Alternative A3 (if any)	m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	m²
Alternative A2 (if any)	m²
Alternative A3 (if any)	m²

7. SITE ACCESS

Does ready access to the site exist?	~~YES~~
If NO, what is the distance over which a new access road will be built	
Describe the type of access road planned:	

There is existing access onto the farm off the district road D52 towards Colenso. See the Locality Map in Appendix A1. This formal access would not be altered. There are existing dirt farm tracks around the farm.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

[2] “Alternative A..” refer to activity, process, technology or other alternatives.

8. SITE OR ROUTE PLAN

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

The site or route plans must indicate the following:

8.1. the scale of the plan which must be at least a scale of 1:500;
8.2. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site;
8.3. the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
8.4. the exact position of each element of the application as well as any other structures on the site;
8.5. the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
8.6. walls and fencing including details of the height and construction material;
8.7. servitudes indicating the purpose of the servitude;
8.8. sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
- rivers, streams, drainage lines or wetlands;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species);

8.9. for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
8.10. the positions from where photographs of the site were taken.

See the proposed Cultivation Layout in Appendix A4.

9. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

See Appendix B.

10. FACILITY ILLUSTRATION

A detailed illustration of the facility must be provided at a scale of 1:200 and attached to this report as Appendix C. The illustrations must be to scale and must represent a realistic image of the planned activity/ies.

See Appendix C.

11. ACTIVITY MOTIVATION

11.1. Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R2 million
What is the expected yearly income that will be generated by or as a result of the activity?	R500 000
Will the activity contribute to service infrastructure?	NO
Is the activity a public amenity?	NO
How many new employment opportunities will be created in the development phase of the activity?	15
What is the expected value of the employment opportunities during the development phase?	R200 000
What percentage of this will accrue to previously disadvantaged individuals?	95%
How many permanent new employment opportunities will be created during the operational phase of the activity?	8
What is the expected current value of the employment opportunities during the first 10 years?	R1 500 000
What percentage of this will accrue to previously disadvantaged individuals?	99%

11.2. Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The strategic context for informing need and desirability is best addressed and determined during the formulation of the sustainable development vision, goals and objectives of Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs) during which collaborative and participative processes play an integral part, and are given effect to, in the democratic processes at local government level *(reference - GNR 792 of 2012; Publication of Need and Desirability Guideline in terms of the Environmental Impact Assessment Regulations, 2010).*

The need and desirability of development must be measured against the contents of the IDP and SDF for the area, and the sustainable development vision, goals and objectives formulated in, and the desired spatial form and pattern of land use reflected in, the area's IDP and SDF respectively.

In the National Spatial Development Perspective (NSDP, 2006) it is highlighted that to achieve the goal of stimulating sustainable economic activities and to create long-term employment opportunities, it is required that *spending on economic infrastructure is focused in priority areas with potential for economic development*, with development to serve the broader societies' needs equitably. The Colenso area has a good agricultural yield potential, and thus investment into agricultural infrastructure and developments would allow for the progressive realisation of this potential.

Cultivation of land on Kopleegte would allow for expansion of an existing cropping operation which would contribute towards improving local and national food security, while providing employment.

According to the Okhahlamba Municipality IDP (2013/2014), the main economic sectors in municipality are agriculture, manufacturing, trade and commerce and tourism. The long term vision of the Municipality hinges around the creation of an *enabling environment* for the different sectors such as agriculture, tourism, education, health, commerce and trade. It also ensures for commercially viable and sustainable livelihoods where local and socio-economic development is optimised for optimal benefit. Environmental Authorization for the cultivation of grasslands on Kopleegte would create such an enabling environment that would promote socio-economic development.

As detailed on page 10 of the Okhahlamba Municipality IDP (2013/2014), the Drakensberg Mountains have the greatest influence on settlement patterns in the area. Slope is a major topographical factor that limits the availability of land for agriculture, in particular for cropping. Croplands require relatively

flat land for cultivation especially where irrigation systems are utilised. The land proposed for cultivation at Kopleegte is flat and well-suited for commercial grain production.

The proposed Kopleegte site is found along the N3 and would not impede at all on the view corridors that provide high quality scenic vistas for visitors to the Drakensberg. The proposed development would be consistent with the current agricultural landuse and the Sense of Place would in no way be altered.

As seen by the Okhahlamba SDF (Appendix G1), the Kopleegte Farm has moderate Agricultural Potential and relatively good soils. The SDF depicts agriculture as the planned landuse.

The proposed development fits wholly into the planning ambit of the local and district municipalities.

Indicate any benefits that the activity will have for society in general:

- Adherence to municipal planning guidelines; development of the region consistent with the expected trends and strategic objectives of the municipality;
- Improved food security due to water and energy efficient production of grains;
- Protection of water resources, decreasing soil erosion and improving wetland condition;
- Efficient water use, taking downstream water consumers into account;
- Conservation of KwaZulu-Natal Highland Thornveld ecosystems through formal protection of 300ha conservation area, allowing for continued provision of eco-services on-farm and the intrinsic value of biodiversity conservation; and
- Biophysically, economically and socially sustainable agriculture, resulting in improved likelihood of sustained agricultural land use for long term food security.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

- Increased direct job opportunities on farm from 15 positions currently to 23 fulltime positions when operational.
- Ancillary development within agricultural sector - mechanics, consultants, fertilizer and seed representatives, transport, implements, machinery etc.
- Not less than minimal wage (likely to be more) for staff, improving the per capita earnings and benefitting the broader community.

12. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Administering authority	Date
National Environmental Management Act (No. 107 of 1998)	Department of Economic Development, Tourism and Environmental Affairs	1998
National Environmental Management: Waste Act (No. 59 of 2008)	Department of Economic Development, Tourism and Environmental Affairs	2008
National Water Act, 1998 (No. 36 of 1998)	Department of Water and Sanitation	1998
Integrated Environmental Management (IEM)	Department of Economic Development, Tourism and Environmental Affairs	2002
South Africa's Constitution (No. 108 of 1996), including the Bill of	The State	1996

Rights (Chapter 2, Section 24)		
Hazardous Substances Act (No 15 of 1973)	Various Departments	1973
National Environmental Management: Biodiversity Act, 2004 (No.10 of 2004)	Department of Economic Development, Tourism and Environmental Affairs & Ezemvelo KZN Wildlife	2004
Atmospheric Pollution Prevention (No. 45 of 1965)	Department of Agriculture and Environmental Affairs	1965
Health Act (No 63 of 2003)	Department of Health	2003
Conservation of Agricultural Resources Act, 1983 (No. 43 of 1983)	Department of Agriculture, Forestry and Fisheries	1983
Publication of Need and Desirability Guideline in terms of the Environmental Impact Assessment Regulations, 2010 (GNR 792 of 2012)	Department of Economic Development, Tourism and Environmental Affairs	2012
Okhahlamba Local Municipality SDF	Okhahlamba Local Municipality	2013
Okhahlamba Local Municipality IDP	Okhahlamba Local Municipality	2014
National Spatial Development Perspective, 2006	The Presidency of South Africa	2006
KwaZulu-Natal Provincial Growth and Development Strategy	KZN Provincial Planning Commission	2014

13. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

13.1. Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase? NO

If yes, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of? (describe)

Where will the construction solid waste be disposed of? (provide details of landfill site)

Will the activity produce solid waste during its operational phase? NO

If yes, what estimated quantity will be produced per month?

How will the solid waste be disposed of? (provide details of landfill site)

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation? NO

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

Is the activity that is being applied for a solid waste handling or treatment facility? NO

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

13.2. Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	NO
If yes, what estimated quantity will be produced per month?	
Will the activity produce any effluent that will be treated and/or disposed of on site?	NO

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	NO

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

13.3. Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	NO
If yes, is it controlled by any legislation of any sphere of government?	

If yes, contact the KZN Department of Economic Development, Tourism & Environmental Affairs to obtain clarity regarding the process requirements for your application.

If no, describe the emissions in terms of type and concentration:

The activities would not release emissions into the atmosphere, apart from standard vehicular emissions from tractors when ploughing / fertilizing fields.

13.4. Generation of noise

Will the activity generate noise?	YES	NO
If yes, is it controlled by any legislation of any sphere of government?		

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

14. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	
Does the activity require a water use permit from the Department of Water Affairs?	NO

If YES, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this report.

The listed activities applied for (i.e. breaking of land; infilling / construction near wetland) do not require water.

However, the cultivated fields will require water for irrigation. This is accounted for under Section 21 of the National Water Act, 1998 (No. 36 of 1998). An Integrated Water Use License Application (IWULA) will be made and the IWULA process will run concurrently to the EIA process; with the IWULA application being lodged shortly after the submission of the final BAR.

15. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Breaking of virgin grassland (GNR 546, 14) – All tillage activities would be conducted under Conservation Agriculture principles of Minimum-Till. In Minimum-Till, the first three steps of conventional cultivation are dispensed with. Planting is done right through the residues of previous plantings and weeds with a devise that cuts a slot a few centimeters wide, followed by a device that inserts the seeds and fertilizer and then closes the trench – these devices all exist on one implement and can be carried out in a single run. Minimum-Till is energy efficient as there is reduced fuel consumption as reduced runs with tractor with reduced vehicle emissions; fewer implements needed and reduced replacement costs of implements.

The applicant would also make use of precision agriculture technologies (such as soil probes and nutrient mapping) for exact moisture and nutrient application on lands.

Constructing wetland crossings (GNR 544, 18) – the position of the wetland crossings is subject to the placement of the irrigation pivots. The irrigation pivots have been strategically placed to minimize on wetlands.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

N / A

SECTION C: SITE/ AREA/ PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

- Subsections 1 - 6 below must be completed for each alternative.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	~~1:20 – 1:15~~	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site **(Please cross the appropriate box)**.

Alternative S1 (preferred site):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	~~Open valley~~	Plain	Undulating plain/low hills	Dune	Sea-front

Alternative S2 (if any):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front

Alternative S3 (if any):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?	~~YES~~	NO

Namely, **'Soils Analysis',** see Appendix D1.

If YES, please complete the following:

Name of the specialist:	Bruce Scott-Shaw, NatureStamp		
Qualification(s) of the specialist:	MSc, Hydrology		
Postal address:	PO Box 949, Hilton		
Postal code:	3245		
Telephone:	033 343 2049	Cell:	078 399 9139
E-mail:	bruce@naturestamp.co.za	Fax:	

	YES	NO
Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?		
If YES, specify and explain:	See Section 4. GROUNDCOVER below.	

	YES	NO
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?		
If YES, specify and explain:	The Soils Analysis Report and associated maps in Appendix D1 show the various soil forms and production potential of the Kopleegte site. Much of the land in the Colenso region is not suitable to crop production due to poor soils, slope and rock. The portion on Kopleegte, however, has suitable topography and relatively good soils. According to the Council for Geoscience Simplified Geology Map of South Africa, Lesotho and Swaziland, the site is associated with the Beaufort Group of the Karoo Supergroup which formed during the late palaeozoic period. It consists largely of sandstone and shale and is intruded by post-Karoo period dolerites. The flatter areas in the west of the region are considered to be arable – this is where Kopleegte is found.	

	YES	NO
Are any further specialist studies recommended by the specialist?		X
If YES, specify:		

	YES	NO
If YES, is such a report(s) attached in Appendix D?		

Signature of specialist: _____ Date: _____

Is the site(s) located on any of the following (cross the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	X		YES	NO	YES	NO
Dolomite, sinkhole or doline areas		X	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	X		YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil		X	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	X		YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	X		YES	NO	YES	NO
Any other unstable soil or geological feature		X	YES	NO	YES	NO

An area sensitive to erosion	YES ~~X~~		YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4. GROUNDCOVER

Has a specialist been consulted for the completion of this section?	~~YES~~	NO

Namely, '**Wetland Assessment**' (Alletson, 2015), see Appendix D2 and
'Vegetation Assessment' (Booth 2015), see Appendix D3.

If YES, please complete the following: '**Delineation and Assessment of Wetlands'.**

Name of the specialist:	Jake Alletson , Terratest		
Qualification(s) of the specialist:	BSc Biological Sciences. 1969. University of Natal, Durban. Botany, Zoology, Chemistry, Biochemistry, Geology, Geography. BSc (Hons) Zoology. 1972.		
Postal address:	Jeffares and Greene, PinOak Avenue, Hilton		
Postal code:	3245		
Telephone:	033 343 6700	Cell:	
E-mail:	AlletsonJ@jgi.co.za	Fax:	

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	~~YES~~	NO

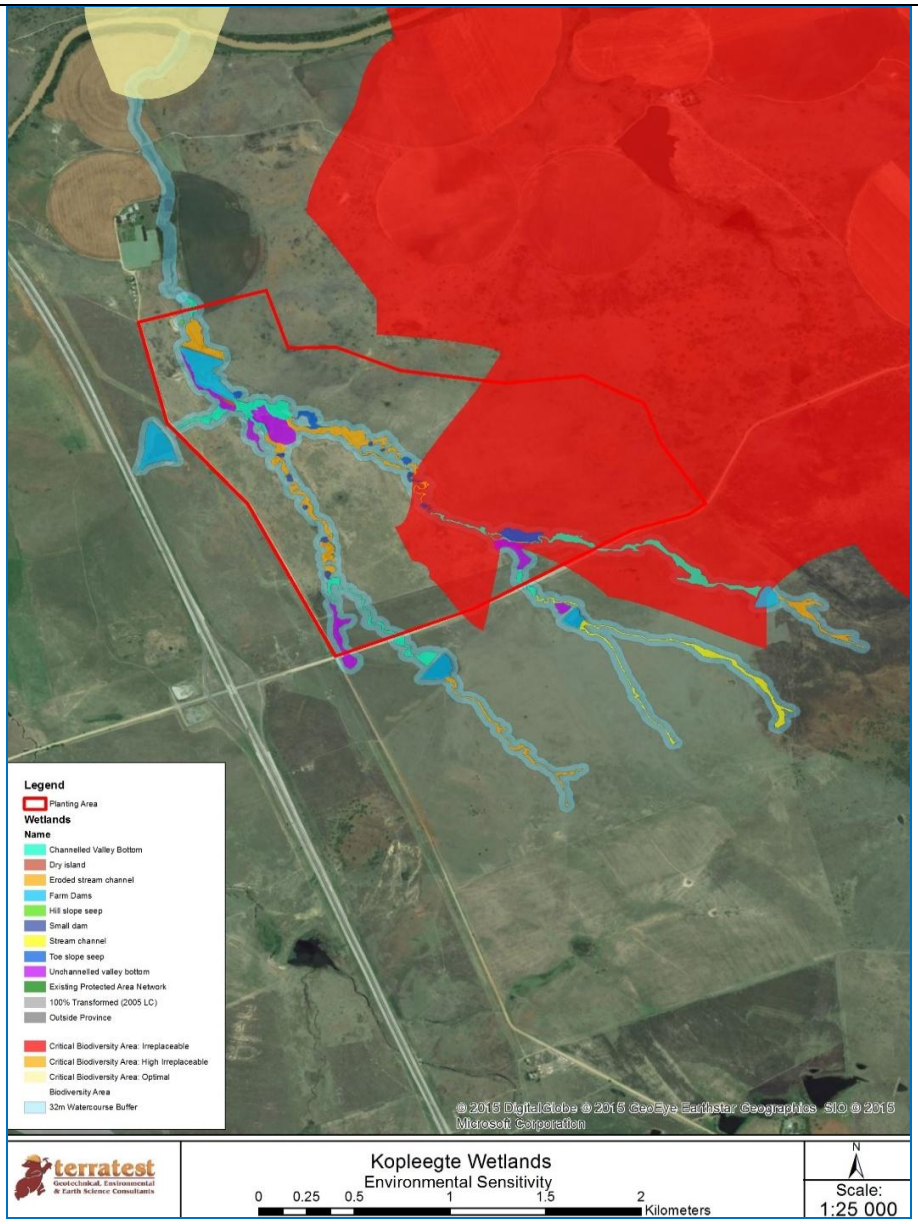
If YES, specify and explain:

Biodiversity

In order to further investigate the biodiversity value on the site, the EKZNW MINSET database was consulted. The MINSET database identifies the minimum number of planning units contained within the province which are required to meet biodiversity conservation targets, and is updated as new information is accumulated. The database spatially classifies planning units into the following categories:

1. Existing Protected area network – Planning units that comprise areas which are formally protected under the National Environmental Management: Protected Areas Act (No 57 of 2003) as amended.
2. 100 % Transformed– Planning units that are 100% transformed in terms of natural asset according to the 2005 EKZNW land cover dataset.
3. Outside Province– Planning units which fall outside of the KZN provincial boundary.
4. Biodiversity Priority Area 1- Planning units which contain features that, if lost, EKZNW conservation targets cannot be met in any other planning unit within the Province.
5. Biodiversity Priority Area 2– Planning units which contain features that, if lost, EKZNW conservation targets can only be met in a very limited number of alternative planning units within the Province.
6. Biodiversity Priority Area 3 - Planning units which contain features that, if lost, EKZNW conservation targets can only be met in a limited number of alternative planning units within the Province.
7. Un-shaded planning units are 'available' to meet conservation targets if any planning units classified as Biodiversity Priority Area 2 or 3 are lost / transformed.

The Ezemvelo KZN Wildlife Minset database showed a Biodiversity Priority Area (BPA) 1 covers a portion of the proposed development site on Kopleegte (see the map below and in Appendix G1).



Ezemvelo KZN Wildlife MINSET database.
A small area of Irreplaceable Critical Biodiversity Area covers a part of the proposed site

The key features within this BPA are the vegetation type and the Blue Crane (*Anthropoides paradiseus*). The vegetation is KwaZulu-Natal Highland Thornveld (Gs 6) (Mucina and Rutherford (2006) and is rated as "*Least Threatened*" after Golding (2002). The Blue Crane is classified as "*Vulnerable*" – that is, an indigenous species facing an extremely high risk of extinction in the wild in the medium term future (SANBI). The Blue Crane birds are known to forage in the upper parts of the wetland (off site) occasionally, but do not breed on the Kopleegte site. During site visits, the EAP saw many Blue Crane foraging on the existing grain pivots on the farm (see image below). Flocks of over-fifty Blue Crane seen at one time would suggest that the landscape mosaic of grain cultivation, amidst Thornveld and watercourse zones associated with the Tugela River is in fact favourable to the species.

Photo taken on Kopleegte Farm, showing Blue Crane foraging in oats

Regarding biodiversity, the Wetland Specialist report deems the wetlands in the study area to be of no particular importance.

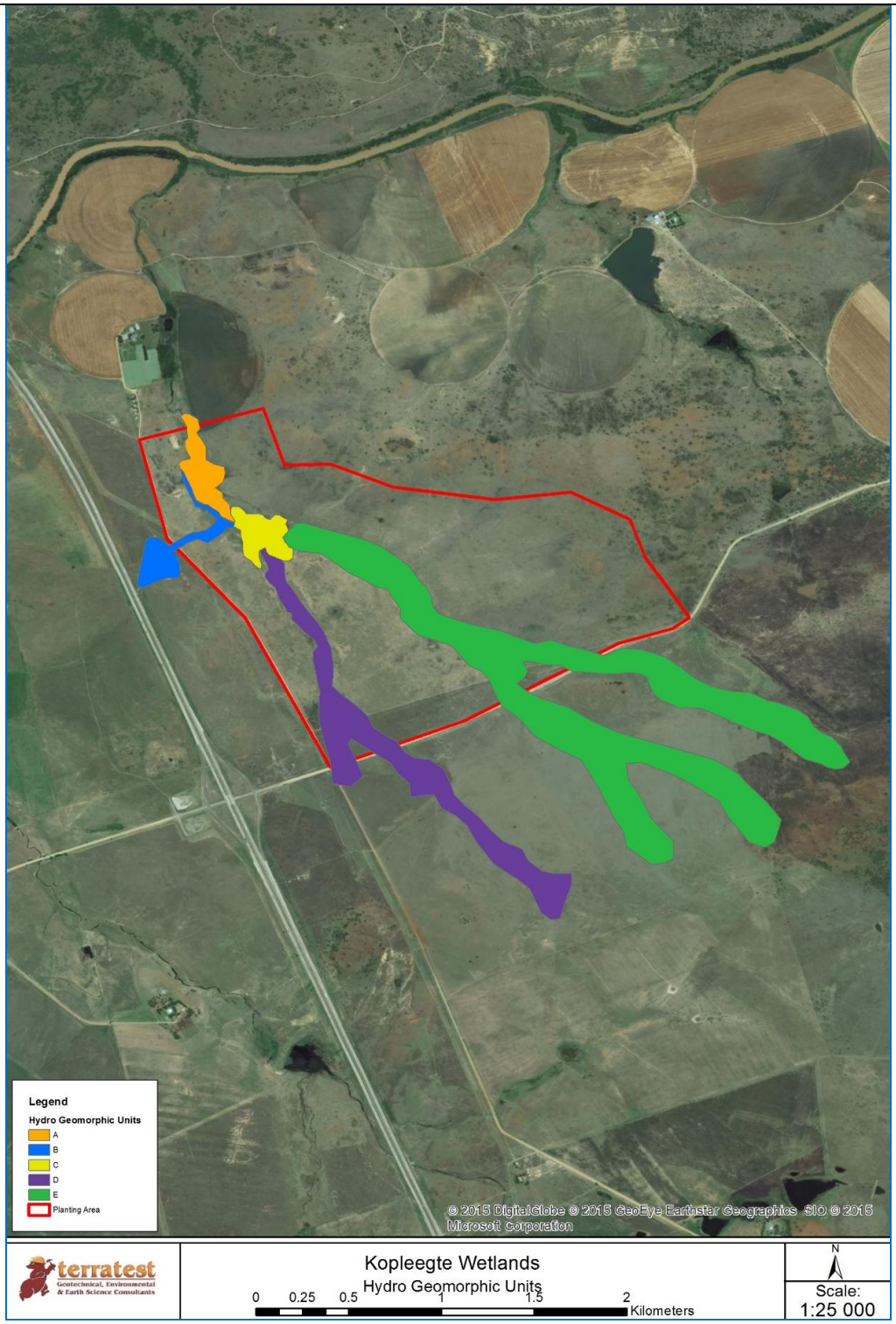
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO
	X	

If YES, specify and explain:

Wetlands

The wetland system consists essentially of two drainage lines, which have some minor tributaries and a confluence area which acts as a sediment trap and which then discharges into a stream which flows on to the Tugela River. The length of the stream from the edge of the study area to the Tugela River is approximately 1.7 km.

The hydrogeomorphic (HGM) units of the wetland on the Kopleegte site have been demarcated on the map below –



Hydrogeomorphic Units used for modelling the wetland system in the WET-Health model.

There is a clear grouping within the hydrological characteristics of the five HGM units with HGMs A, B, and C standing apart from D and E. This split derives from the erosion characteristics of the different units with severe erosion being taken to have a strong adverse impact on the flow and retention of water. HGM E is the worst in this regard as is indicated by its geomorphology score.

The EAP and applicant have taken into account the status and health of the different HGM units, and purposefully positioned the proposed cultivation within HGM unit D and E (most degraded systems). The healthier HGM units A, B and C would in no be impacted upon. The table below summarizes the condition of

the HGM units, and the associated development plans.

HGM No.	Notes	Photograph	Proposed development impacts
A	Lowest section of the wetland system before Tugela River. Includes a defunct dam.		Excluded from project footprint
B	Lateral system feeding into the defunct farm dam. Important seep zones and well-developed wetland soils.		Excluded from project footprint
C	Confluence area of two long drainage line systems. Retains sediment and water. Well developed vegetation communities.		Excluded from project footprint. There would be 16.79ha cultivation bordering on this system – however a 30m buffer would be maintained around the wetland and there would be no wetland crossings.
D	Eroded in places. Several small soil retention dams. Degraded system Poor water and sediment retention properties. Severe bank erosion leads to sediment inputs.		Included in project footrpint. Wetland rehabiittaion would stabalize erosion
E	Drainage line which is severely eroded in places. Several small soil retention dams. Two farm dams in the headwaters area. Generates considerable quantity of loose sediment. Vegetated stream banks. Such areas often have lateral seep zones which contribute water to the system. Sediment retention is limited.		Included in project footrpint. Pivot wheels would traverse system. Wetland rehabiittaion would occur as required. 30m wetland buffer would be applied where appropriate

Assessing the entire wetland system with the WET-Health and WET-Ecoservices models shows that it has a low environmental status: the Present Ecological State (PES) of the entire wetland on Kopleegte is poor; and

the level of ecosystem services is low.

It is noteworthy that the drivers which have led to the degradation of the system are not related to direct utilisation of resources from the wetlands as is commonly the case where drainage and cultivation has been done or where pastures have been established. In this instance the primary driver is erosion of the banks and channels and that has been largely the consequence of overgrazing and over-frequent burning of the veld over a period of many decades. Such practices, combined with the highly erodible soils characteristic of the region, have resulted in massive wetland loss and associated diminution of water resources. Implicit within these observations is the fact that the proposed cultivation of the surrounding area need not necessarily lead to any further degradation of the system – in fact the proposed cultivation would allow for the functions of the most degraded wetland areas to be improved.

The Wetland Specialist proposes the following recommendations to protect and enhance the wetland systems –

- Buffer - Apply a 40m no-cultivation buffer on wetland areas. The service track which will pass around the periphery of the cultivated area may lie within the buffer.
  EAP note - Only the most degraded HGM units have been included in the proposed cultivation plan. In light of this, the EAP has decreased the buffer to 30m and included additional mitigation measures to stabilize HGM units D and E.

- Vehicular access - there should not be more than one formal stream crossing which passes through the wetland area. It is recognised that the farmer will need to move tractors and implements from the cultivated area on one side of the wetland system to the other. It therefore suggested that a crossing be allowed but that it be over constructed earth dam walls.
  EAP note – this would be undertaken.

- Veld burning - The incidence of burning the veld within the buffer area should be reduced. Ideally no grassland area should be burned in two consecutive years and the wetland areas should only be burned once in every three years. The intention of the recommendation is to allow the vegetation in the wetland area greater opportunity to spread and to become more dense – with the consequence of improving both biodiversity and water retention and yield. At the same time, if fertilisers do leach in from the croplands, the improved vegetation will lead to better removal of the phosphates and nitrates.
  EAP note – this would be undertaken.

- Earthern constructions to limit erosion - The practice of building small earth dams in the channels is to be commended since both water and sediment are retained. At the same time the local environment becomes more stable and biodiversity is improved. It is recommended that at least three more walls are constructed in each channel in HGMs D and E.
  EAP note – the proposed watercourse crossings (to allow the pivot wheel to cross the wetland) would serve exactly this purpose.

- Erosion head cut - It is recommended that the active erosion head cut downstream of the old dam near the bottom end of the wetland should be stabilised. This may be done by either a rock pack or, preferably, the installation of stone-filled gabion baskets.
  EAP note – this is outside of the proposed development site, but would be undertaken in order to improve the overall function of the entire wetland system.

The above-mentioned recommendations should be included as conditions of Environmental Authorization.

In conclusion, should all the proposed recommendations be diligently implemented, the proposed cultivation would provide an overall nett benefit to the entire wetland systems, as follows -

- Development activities would only affect the most degraded HGM units D and E. More pristine HGM units A, B and C would be left untouched;
- Watercourse crossings over HGM units D and E (for pivot wheels) would improve wetland functionality through increased soil retention and stabilizing of geomorphology; and
- Management of buffer areas and minimum-tillage practises would ensure adequate soil cover and infiltration rates.

Are any further specialist studies recommended by the specialist?	YES	~~NO~~
If YES, specify:		
If YES, is such a report(s) attached in Appendix D?	YES	NO

Signature of specialist: _____ Date:

If YES, please complete the following: '**Vegetation Assessment'.**

Name of the specialist:	Lauren Booth, UmfulaECO		
Qualification(s) of the specialist:	BSc. Honours (Ecology), MSc. Ecology; IAIAsa		
Postal address:	PO Box 518, Howick, 3290		
Postal code:	3290		
Telephone:	082 791 7069	Cell:	
E-mail:	lauren@umfulaeco.co.za	Fax:	086 556 2249

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	~~YES~~	NO
If YES, specify and explain:	See below.	
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	~~YES~~	NO

If YES, specify and explain:

Vegetation

According to Mucina & Rutherford, the vegetation type on Kopleegte Farm is KZN Highland Thornveld (Gs 6, Grassland Biome). It occurs in hilly, undulating landscapes and broad valleys as a series of patches in the central-northern regions of KwaZulu-Natal, where it occurs on both dry valleys and moist upland. The biome typically occurs at an altitude range between 920–1 440 m. The region from Ladysmith, Winterton, Estcourt and Colenso supports one of the most extensive areas of KZN Highveld Thornveld. KZN Highland Thornveld is characteristically dominated by tall *Hyparrhenia hirta* grassland, interspersed with *Acacia sieberiana* woodlands and pockets of *A. karroo* and *A. nilotica*. In terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), this vegetation type's conservation status is "Least threatened".

Disturbance is evident on proposed development site - particularly between the western boundary and the drainage lines. Many invasive, ruderal plant species were noted in this area and it is evident that the anthropogenic influences (i.e. access road, salt licks etc) have influenced the composition of the sward.

East of the drainage lines, particularly on the higher grounds on the eastern boundary, the site is more intact with good quality grasslands. Large portions of this area of the site were dominated by *Themeda triandra*, a palatable grass species.

The percentage cover of indigenous plant species is higher in the east, further away from

the drainage lines and anthropogenic disturbances that occur on the western side of the site.

The site borders on a migration corridor along the Tugela Valley to the north, and while the proposed transformation of land for crop agriculture would result in the loss of indigenous vegetation, it still provides habitat for many species and allows for movement thereof.

A total of 97 plant species were found on site. Many of these (*Acacia sieberiana* DC. var. *woodii* (Burtt Davy) Keay & Brenan, *Cussonia* sp., *Dichrostachys cinerea* (L.) Wight & Arn., Helichrysum *rugulosum* Less., *Chaetacanthus setiger* (Pers.) Lindl., *Rhynchosia* sp. And *Hermannia depressa* N.E. Br.) are considered to be important taxa associated with KZN Highland Thornveld.

The threatened plant species predicted to occur on the site according to EKZN Wildlife's SEA database, *Bowiea volubilis*, was not encountered on site. This is a delicate climber that typically occurs in thickly vegetated river valleys, under bush clumps and in amongst boulders. The Kopleegte site does not particularly hold such niche environments and presence of the specie is unlikely.

The majority of the species on site are classified as "Least Concern" in the Red Data List (IUCN, 2009). One species, *Hypoxis hemerocallidea* Fisch., C.A.Mey. & Avé-Lall.), is classified as "Declining" due to heavy harvesting pressure for the medicinal trade.

See the full plant species list in the Vegetation Report in Appendix D3 .

The following recommendations are from the Vegetation Specialist report, and should be included as conditions of Environmental Authorization –

- A second site visit after a spring burn will provide further insight into the diversity of the vegetation found on site. This should be undertaken in October / November 2015 to capture the early flowering species. An addendum to the Vegetation Report, including an updated list plant species can be provided.
  EAP note – this would be undertaken and would be included in the final BAR. Any red data species identified would be earmarked for a plant re-location to the 300ha game camp conservation area should Environmental Authorization be granted.

- The early indications are that parts of the site are suitable for agricultural development and the disturbed areas west of the drainage lines are preferred in this regard. Careful placement of pivots is critical and the western portion of the site is preferred in this regard to minimise the impact on the high quality Themeda veld on site.
  EAP note – the placement of the pivots (see Appendix A4) considers this and efforts have been made to use more of the western side of the site.

- Opportunities to improve the sward composition on site exist where major disturbances have altered species composition. An Alien Vegetation Management Programme should be compiled in this regard. The reestablishment of indigenous vegetation in disturbed areas could provide a good trade off opportunity.
  EAP note – this would be undertaken in the uncultivated portions of the land.

- Rescue and relocation of any species of significance (e.g. KZN endemics) from the areas identified for cultivation is recommended prior to transformation.
  EAP note – the "Declining" species, *Hypoxis hemerocallidea* would be rescued and relocated prior to cultivation of land. Furthermore, any red data species identified during the second plant study (October / Nov 2015) would be earmarked for a plant re-location to the 300ha game camp conservation area should Environmental Authorization be granted.

Although KZN Highland Thornveld is considered "'Least Threatened' and various mitigation measures have been put in place to reduce impacts on vegetation, there would still be a direct loss of grassland as a result of the proposed transformation of land. To offset this loss of grassland, the applicant would enter into the BSP with EKZNW and afford the 300ha KZN Highland Thornveld game camp on the farm conservation protection. As mentioned in the Vegetation Report, this conservation area includes the eastern side of the site which is more intact with good quality grasslands (see the Farm Layout in Appendix A2).

All management practises conducted on the conserved 300ha game camp, including stocking rates and burning regime, would be for conservation purposes. Generic Management Principles for proper veld management for biodiversity are as follows, and are included in the dEMPr found in Appendix F.

Fencing and water provision

- The position of fences must coincide with ecological boundaries in order to minimize selective grazing from taking place.
- Water provision follows fence placement in order to make sure that adequate quality and quantity is supplied to livestock for optimum production.

Fire Management

- Fire is a useful tool to remove excess moribund material from the grass sward, to allow for the re-growth of palatable material, to control alien invasive vegetation and to burn fire breaks.
- The way in which fire is used is important to achieve positive outcomes. It is well-research that incorrect burning can have a significant deleterious effect on grassland as it destroys the growing point of the grass tiller which leads to temporary reduction in grass growing vigour. Burning can also reduce total production of dry matter by up to 30%.
- Burning of the KZN Thornveld Grassland should take place once in every three years.
- Burning is not only suitable from a livestock and grassland management perspective, but has also been shown to be beneficial to aspects of biodiversity such as game birds and insects.

Alien Plant control

- Invasive plants, whether indigenous or exotic, pose a real threat to veld rehabilitation in general.
- Timely intervention, whether chemical, biological or physical, is required in order to control the situation.

Are any further specialist studies recommended by the specialist?	YES	~~NO~~
If YES, specify:		
If YES, is such a report(s) attached in Appendix D?	YES	NO

Signature of specialist: _____ Date: _____

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

~~Natural veld - good condition~~[E]	~~Natural veld with scattered aliens~~[E]	Natural veld with heavy alien infestation[E]	Veld dominated by alien species[E]	Gardens
Sport field	~~Cultivated land~~	Paved surface	~~Building or other structure~~	Bare soil

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5. LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

Land use character			**Description**
Natural area	YES		Kopleegte Farm is within an agricultural region. There are areas of untransformed grasslands, wetlands and indigenous bush surrounding the property. As such, the proposed development of cultivated lands would be compatible with the surrounds.
Low density residential		~~NO~~	N / A
Medium density residential		~~NO~~	N / A
High density residential		~~NO~~	N / A
Informal residential		~~NO~~	N / A
Retail commercial & warehousing		~~NO~~	N / A
Light industrial		~~NO~~	N / A
Medium industrial		~~NO~~	N / A
Heavy industrial		~~NO~~	N / A
Power station		~~NO~~	N / A
Office/consulting room		~~NO~~	N / A
Military or police base/station/compound		~~NO~~	N / A
Spoil heap or slimes dam		~~NO~~	N / A
Quarry, sand or borrow pit		~~NO~~	N / A
Dam or reservoir	YES	NO	There is a series of small dams along the linear wetland system. The dams have been accounted for within the development proposal.
Hospital/medical centre		~~NO~~	N / A
School/ crèche		~~NO~~	N / A
Tertiary education facility		~~NO~~	N / A
Church		~~NO~~	N / A
Old age home		~~NO~~	N / A
Sewage treatment plant		~~NO~~	N / A

Train station or shunting yard		NO	N / A
Railway line		NO	N / A
Major road (4 lanes or more)		NO	The N3 is found to the west of the site. The N3 influences the development as it creates a corridor of activity – into which the proposed development would align. It allows for accessibility and efficient transport of grain produce off the farm and agricultural inputs onto the farm.
Airport		NO	N / A
Harbour		NO	N / A
Sport facilities		NO	N / A
Golf course		NO	N / A
Polo fields		NO	N / A
Filling station		NO	N / A
Landfill or waste treatment site		NO	N / A
Plantation		NO	N / A
Agriculture	YES	NO	Kopleegte Farm is within an agricultural region. There are areas of cultivated lands and agricultural infrastructure surrounding the property.
River, stream or wetland	YES	NO	There is a drainage / wetland network running from south to north through the site. The development proposal has sensitively taken into account these watercourses with the inclusion of buffer areas, mitigation and wetland crossings where required.
Nature conservation area	YES	NO	There is no current nature conservation area within 500m of the proposed development, however as a means to offset the loss of KZN Thornveld Grassland, the applicant would enter into the BSP with EKZNW and afford the 300ha game camp on the farm further conservation protection.
Mountain, hill or ridge	YES	NO	There is an untransformed thornveld hill rising up to the east of the proposed cultivation site. To offset the loss of grassland from the proposed cultivation, this area would form part of the conserved game camp would be deemed as a conservation zone – where no further development would take place. The hill does not impact / influence the application in anyway, but presents opportunity to create ecological corridors across the land.
Museum		NO	N / A
Historical building		NO	N / A

Protected Area		NO	N / A
Graveyard		NO	There are several grave sites on the land associated with Late Iron Age and Boer times. These sites would be buffered and excluded from development. A Heritage Specialist report has been done and includes all details (Section C6 and Appendix D4).
Archaeological site	YES		There are several archaeological sites on the land associated with Late Iron Age and Boer times. These sites would be buffered and excluded from development. A Heritage Specialist report has been done and includes all details (Section C6 and Appendix D4).
Other land uses (describe)		NO	N / A

6. CULTURAL/ HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site?	YES	

If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report.

Briefly explain the recommendations of the specialist:	The footprint of the proposed activities exceeds 1 hectare and would impact on untransformed lands – as such, a Heritage Impact Assessment (HIA) was conducted (see the full report in Appendix D4). Active Heritage cc conducted the first HIA in April 2015. This study determined the presence of four clusters of Later Iron Age sites. The results of the first HIA were included in the BID and circulated to IAPs. An IAP queried these HIA findings, stating that the site has in fact more heritage resources. Thus, a second HIA was conducted by Umlando: Archaeological Surveys and Heritage Management in August 2015. The Umlando Report is thorough and comprehensive and builds onto the first HIA. Generally, the area has heritage sensitivity for two reasons. Firstly, there are many known Late Iron Age to Historical Period stone walled settlements dating from ACE1250 onwards. Some of the hills contain engravings while the settlements often have human remains. Secondly, the area is related to the 2nd Anglo-Boer War as it occurs between Colenso and Spionkop and would have had British Forces passing through. The field survey recorded several stone walled features and graves on the Kopleegte site. The low stone walled features are mostly of low significance unless they have a grave inside them. These sites tend to yield very few artefacts and occur in abundance in this part of KZN. There are two ways to mitigate impacts of cultivation of these features –

1) If the stone wallings are to be affected by the crop pivots, then they should be mapped and photographed after a field burn to allow for accurate recording of all shallow and small features. Thereafter, they can be destroyed once a permit from Amafa KZN has been granted.
2) The alternative is to place a 5m buffer around these features and not disturb them.

EAP note – the applicant would buffer all stone wall sites with a 5m buffer according to HIA specialist specification. The layout in Appendix A4 shows the 'buffer exclusions' from the area to be cultivated under pivot.

The grave sites include archaeological graves and graves dating to the last 100 years. The archaeological graves could be excavated once a permit from Amafa KZN has been granted, however, the graves dating to the last 100 years would require further investigation and social consultation. It would be preferable to buffer these newer graves. Grave buffers are required to be 5m between the grave edge and the form of demarcation.

EAP note – All graves would be buffered with a 5m buffer according to HIA specialist specifications.

Note on buffers – the standard width for heritage buffers is 20m. However, given the space constraints and the low significance of the heritage features, Umlando supports decreasing the 20m buffer provided that the sites are clearly demarcated. The HIA specialist supports only a 5m buffer around all the graves and other features. All buffers must high enough to be seen over the crop and metal fence poles are recommended in this regard.

Most of the eastern hill has been farmed in the early 20th century and this would have destroyed any intact archaeological deposit. The middle and western hills appear to be grasslands. The cultural landscape has been severely affected by previous agricultural activities and transmission lines. For interest - the hill to the west of the Kopleegte site (offsite) was studied by Umlando in detail for the Transnet New Multi-Product Pipeline (NMPP). This area revealed a many heritage sites and is still mostly well preserved. In order to construct the NMPP, this zone was excavated in 2009 – 2010. The excavations extended for 1km in a 10m wide strip. Furthermore, the NMPP affected a 30m wide area and this was monitored during construction. Very few artefacts were noted during the NMPP mitigation, and by inference, the area to the east of the line (proposed cultivation on Kopleegte site) would have even fewer artefacts and features, as noted during the brief surveys.

Thus, the HIA specialist supports the proposed agricultural project provided the required mitigation is undertaken.

Will any building or structure older than 60 years be affected in any way?	YES	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	NO

If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

All heritage sites would be buffered and undisturbed. At a later date, the applicant may apply for permits from Amafa KZN to excavate and remove heritage sites – but this would fall outside of the scope of this EIA application.

SECTION D: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;

This was conducted. See the photographs in Appendix E3.

(b) giving written notice to—
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the local and district municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project); and
  (vii) any other party as required by the competent authority;

This was conducted. See the BID in Appendix E2, and IAP register in Appendix E1.

(c) placing an advertisement in—
  (i) one local newspaper; or
  (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and

(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
  (i) illiteracy;
  (ii) disability; or
  (iii) any other disadvantage.

Public Notices were placed in the Witness newspaper on the 16th June 2015 and The Ladysmith Gazette on the 19th June 2015. See evidence of this in Appendix E3.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:
(a) indicate the details of the application which is subjected to public participation; and
(b) state—
  (i) that an application for environmental authorization has been submitted to the KZN Department of Economic Development, Tourism & Environmental Affairs in terms of the EIA Regulations, 2010;(ii)
  (iii) a brief project description that includes the nature and location of the activity to which the application relates;
  (iv) where further information on the application can be obtained; and
  (iv) the manner in which and the person to whom representations in respect of the application may be made.

Noted. This was adhered to.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

Noted. This was adhered to.

4. DETERMINATION OF APPROPRIATE PROCESS

The EAP must ensure that the public participation process is according to that prescribed in regulation 54 of the EIA Regulations, 2010, but may deviate from the requirements of subregulation 54(2) in the manner agreed by the KZN Department of Economic Development, Tourism & Environmental Affairs as appropriate for this application. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate.

Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

The BID stated that should it be required, a public meeting describing all details of the project will be held to further inform IAPs. This will be dependent on the interest shown in the project and at the discretion of the EAP. To date, there has been very little shown in the project. Two stakeholders (DAFF and DARD) have submitted comments; and one neighbour has commented to say he has no objections.

Thus, due to the very limited interst in the project, a public meeting was not deemed necessary.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before this application is submitted. The comments and responses must be captured in a comments and response

report as prescribed in the EIA regulations (regulation 57 in the EIA Regulations, 2010) and be attached as Appendix E to this report.

Noted. This was adhered to.

6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of this application and provided with an opportunity to comment.

Has any comment been received from the district municipality? | | NO |
If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

No comment received as yet.

Has any comment been received from the local municipality? | | NO |
If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

No comment received as yet.

Has any comment been received from a traditional authority? | YES | NO |
If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

Kopleegte Farm is privately owned and the traditional authority is not an IAP on this project.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders? | YES | NO |
If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application – see Appendix E5 for full comments):

DARD, Hlamalani Mongwe
30 June 2015

The Provincial DARD requires a Soil specialist study of the farm, over and above the vegetation study has been reportedly requested.

These two studies (soil and vegetation studies) must be submitted to Land Use Regulatory Unit of DARD for assessment.

DAFF, Ms N Sontangane
29 June 2015

The vegetation assessment summary provided in the BID indicates that the site features some disturbed areas, good quality grasslands and clumps of Acacia trees.

In addition, the proposed land transformation will result in loss of indigenous vegetation which provides habitat for many species.

The DAFF requests that the draft Basic Assessment Report should include the complete vegetation assessment report.

This study will assist in determining the impact that the development may have on the indigenous trees and/or protected trees in terms of the National Forests Act of 1998 (Act no.84 of 1998). Further comments will be issued upon receipt and review of the dBAR.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

Only one comment of no objection has been received by a neighbour.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached as Appendix E to this report):

N / A

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the planning and design phase:

No alternative sites are relevant to this application for the reasons outlined in Section B4. FEASIBLE AND REASONABLE ALTERNATIVES above.

Alternative S1 (preferred alternative)

Direct impacts:

- Minor disturbance of flora and fauna during specialist investigations.

Indirect impacts:

- No impacts

Cumulative impacts:

- No impacts

Alternative S2 (if any)

No-go alternative (compulsory)

Direct impacts:

- No impacts

Indirect impacts:

- No impacts

Cumulative impacts:

- No impacts

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	**Alternative S2**
Direct impacts: • Minor disturbance of flora and fauna during specialist investigations. The impact is low and temporary – thus deemed insignificant	

b. Process, technology, layout or other alternatives

List the impacts associated with any process, technology, layout or other alternatives that are likely to occur during the planning and design phase (please list impacts associated with each alternative separately):

There are no alternative processes, technologies or layouts considered in this application, for reasons outlined in Section B4. above.

Alternative A1 (Appendix A4)

Direct impacts:
- Minor disturbance of flora and fauna during specialist investigations.

Indirect impacts:
- No impacts

Cumulative impacts:
- No impacts

Alternative A2

Alternative A3

No-go alternative (compulsory)

Direct impacts:
- No impacts

Indirect impacts:
- No impacts

Cumulative impacts:
- No impacts

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1, A2 and A3:

The impact is low and temporary – thus deemed insignificant.	

2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION / IMPLEMENTATION PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction / implementation phase:

No alternative sites are relevant to this application for the reasons outlined in Section B4. above.

Alternative S1 (preferred site)

Direct impacts:

Breaking of virgin land

- Loss of virgin grassland and associated biodiversity
- Exposure of soil during harvesting and planting

Construction of wetland crossings (location restricted to path of centre pivot wheels)

- Disturbance of wetland vegetation
- Disturbance of hydrology
- Soil compaction
- Possible soil erosion

Indirect impacts:

Breaking of virgin land

- Possible changes in the surface cover of the soil

Construction of wetland crossings

- Disturbance of wetland fauna
- Possible sedimentation of drainage line / wetlands

Cumulative impacts:

Breaking of virgin land

- Irreplaceable loss of grasslands and associated biodiversity

Alternative S2 (if any)

No-go alternative (compulsory)

Direct impacts:

- No impact

Indirect impacts:

- Continued spread of alien invasive plants.
- Continued soil loss from wetland areas
- No conservation of 300ha game camp
- No custodianship of biodiversity – open to disturbance by irresponsible land practices.

Cumulative impacts:

- Land is liable to further applications by less environmentally conscious applicants
- No safeguarding of biodiversity heritage and water resources

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1 **Alternative**

	S2
Mitigation Measures for Breaking of virgin land • Placement of cultivated portions on more degraded areas of veld. • Rescue and relocation of any red data species of significance from the areas identified for cultivation prior to transformation. • Implementation of Alien Vegetation Management Programme and reestablishment of indigenous vegetation in disturbed areas undertaken in the uncultivated portions of the land • Enter into BSP with EKZNW and afford the 300ha KZN Highland Thornveld game camp on the farm conservation protection. • Buffering of all heritage sites (5m) • Planting of cover crops planted in cultivated areas over winter to assist with soil erosion. • All cultivation using 'Minimum-Till' methods (no ploughing, no exposure of bare soils, thick mulch promoted). • Buffering of wetland of 30m - cultivation would take place from the edge of this zone. • Stabilizing of degraded wetland areas to prevent soil wash *Mitigation Measures for construction of wetland crossings* • Placement of cultivated lands near degraded wetland HGM units. • A 30m buffer of indigenous vegetation would remain around wetlands • The incidence of burning the veld within the buffer area would be reduced to once in every three years. This would allow the buffer to become denser – with the consequence of improving both biodiversity and water retention and yield. At the same time, if fertilisers do leach in from the croplands, the improved vegetation will lead to better removal of the phosphates and nitrates. • All alien vegetation within wetlands would be removed and rehabilitated with representative wetland species. • There would be one formal stream crossing to allow vehicular access across wetland area. This would likely be over existing constructed earth dam walls. • Earthern constructions (crossings) would allow pivot wheels to cross the wetland; these would also retain water and sediment and stabilize the environment. • Indigenous water-tolerant vegetation would be put in place below the crossing culverts in order to prevent erosion and scour. • Active erosion head cut downstream of the old dam near the bottom end of the wetland would be stabilised. Rock pack or installation of stone-filled gabion baskets would be used.	

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the construction phase (please list impacts associated with each alternative separately):

There are no alternative processes, technologies or layouts considered in this application, for reasons outlined in Section B4. above.

Alternative A1 (Appendix A4)

Direct impacts:

- Loss of 98.95 hectares of virgin grassland

Indirect impacts:

- Project Irreplaceable loss of grasslands and associated biodiversity

Cumulative impacts:

- Irreplaceable loss of grasslands and associated biodiversity

Alternative A2

Alternative A3

No-Go (compulsory)

Direct impacts:

- No impact

Indirect impacts:

- Continued spread of alien invasive plants.
- Continued soil loss from wetland areas
- No conservation of 300ha game camp
- No custodianship of biodiversity – open to disturbance by irresponsible land practices.

Cumulative impacts:

- Land is liable to further applications by less environmentally conscious applicants
- No safeguarding of biodiversity heritage and water resources

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1, A2 and A3:

Mitigation Measures for Breaking of virgin land

- Placement of cultivated portions on more degraded areas of veld.
- Rescue and relocation of any red data species of significance from the areas identified for cultivation prior to transformation.
- Implementation of Alien Vegetation Management Programme and reestablishment of indigenous vegetation in disturbed areas undertaken in the uncultivated portions of the land
- Enter into BSP with EKZNW and afford the 300ha KZN Highland Thornveld game camp on the farm conservation protection.
- Buffering of all heritage sites (5m)
- Planting of cover crops planted in cultivated areas over winter to assist with soil erosion.
- All cultivation using 'Minimum-Till' methods (no ploughing, no exposure of bare soils, thick mulch promoted).
- Buffering of wetland of 30m - cultivation would take place from the edge of this zone.
- Stabilizing of degraded wetland areas to prevent soil wash

Mitigation Measures for construction of wetland crossings

- Placement of cultivated lands near degraded wetland HGM units.
- A 30m buffer of indigenous vegetation would remain around wetlands
- The incidence of burning the veld within the buffer area would be reduced to once in every three years. This would allow the buffer to become denser – with the consequence of improving both biodiversity and water retention and yield. At the same time, if fertilisers do leach in from the croplands, the improved

vegetation will lead to better removal of the phosphates and nitrates. • All alien vegetation within wetlands would be removed and rehabilitated with representative wetland species. • There would be one formal stream crossing to allow vehicular access across wetland area. This would likely be over existing constructed earth dam walls. • Earthern constructions (crossings) would allow pivot wheels to cross the wetland; these would also retain water and sediment and stabilize the environment. • Indigenous water-tolerant vegetation would be put in place below the crossing culverts in order to prevent erosion and scour. • Active erosion head cut downstream of the old dam near the bottom end of the wetland would be stabilised. Rock pack or installation of stone-filled gabion baskets would be used.	

2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the operational phase:

No alternative sites are relevant to this application for the reasons outlined in Section B4. above.

Alternative S1 (preferred alternative)

Direct impacts:

Breaking of virgin land

- Exposure of soil during harvesting and planting

Construction of wetland crossings

- No impact as crossings are already established
- Minimal maintenance required

Indirect impacts:

Breaking of virgin land

- Possible contamination of wetlands with fertiliser runoff and leaching

Construction of wetland crossings

- No impact

Cumulative impacts:

Breaking of virgin land

- Loss of virgin grassland and associated biodiversity

Construction of wetland crossings

- No impact

Alternative S2 (if any)

No-go alternative (compulsory)

Direct impacts:

- No impact

Indirect impacts:

- Continued spread of alien invasive plants.

- Continued soil loss from wetland areas
- No conservation of 300ha game camp
- No custodianship of biodiversity – open to disturbance by irresponsible land practices.

Cumulative impacts:

- Land is liable to further applications by less environmentally conscious applicants
- No safeguarding of biodiversity heritage and water resources

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	**Alternative S2**
Mitigation Measures for Breaking of virgin land • Placement of cultivated portions on more degraded areas of veld. • Implementation of Alien Vegetation Management Programme and reestablishment of indigenous vegetation in disturbed areas undertaken in the uncultivated portions of the land • Enter into BSP with EKZNW and afford the 300ha KZN Highland Thornveld game camp on the farm conservation protection. • Buffering of all heritage sites (5m) • Planting of cover crops planted in cultivated areas over winter to assist with soil erosion. • All cultivation using 'Minimum-Till' methods (no ploughing, no exposure of bare soils, thick mulch promoted). • Buffering of wetland of 30m - cultivation would take place from the edge of this zone. • Stabilizing of degraded wetland areas to prevent soil wash *Mitigation Measures for construction of wetland crossings* • Not required. • Minimal on-going maintenance	

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the operational phase (please list impacts associated with each alternative separately):

There are no alternative processes, technologies or layouts considered in this application, for reasons outlined in Section 4. above.

Alternative A1 (Appendix A4)

Direct impacts:

- Loss of 98.95 hectares of virgin grassland

Indirect impacts:

- Project Irreplaceable loss of grasslands and associated biodiversity

Cumulative impacts:

- Irreplaceable loss of grasslands and associated biodiversity

Alternative A2

Alternative A3

No-Go (compulsory)

Direct impacts:

- No impact

Indirect impacts:

- Continued spread of alien invasive plants.
- Continued soil loss from wetland areas
- No conservation of 300ha game camp
- No custodianship of biodiversity – open to disturbance by irresponsible land practices.

Cumulative impacts:

- Land is liable to further applications by less environmentally conscious applicants
- No safeguarding of biodiversity heritage and water resources

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1, A2 and A3

Mitigation Measures for Breaking of virgin land

- Placement of cultivated portions on more degraded areas of veld.
- Implementation of Alien Vegetation Management Programme and reestablishment of indigenous vegetation in disturbed areas undertaken in the uncultivated portions of the land
- Enter into BSP with EKZNW and afford the 300ha KZN Highland Thornveld game camp on the farm conservation protection.
- Buffering of all heritage sites (5m)
- Planting of cover crops planted in cultivated areas over winter to assist with soil erosion.
- All cultivation using 'Minimum-Till' methods (no ploughing, no exposure of bare soils, thick mulch promoted).
- Buffering of wetland of 30m - cultivation would take place from the edge of this zone.
- Stabilizing of degraded wetland areas to prevent soil wash

Mitigation Measures for construction of wetland crossings

- Not required.
- Minimal on-going maintenance

2.4. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING OR CLOSURE PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the decommissioning or closure phase:

No alternative sites are relevant to this application for the reasons outlined in Section B4. above.

Alternative S1 (preferred alternative)

Direct impacts:
- Invasion of alien plants

Indirect impacts:
- Invasion of alien plants

Cumulative impacts:
- Decrease in biodiversity

Alternative S2

No-go alternative (compulsory)

Direct impacts:
- No impact

Indirect impacts:
- No impact

Cumulative impacts:
- No impact

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	**Alternative S2**
Upon decommissioning, the transformed lands should be seeded with an indigenous grass mix and an ongoing Alien Invasive Management Plan should be implemented.	

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the decommissioning or closure phase (please list impacts associated with each alternative separately):

Alternative A1 (Preferred Option), A2 and A3 (preferred alternative)

Direct impacts:
- Invasion of alien plants

Indirect impacts:
- Invasion of alien plants

Cumulative impacts:
- Decrease in biodiversity

No-go alternative (compulsory)

Direct impacts:
- No impact

Indirect impacts:
- No impact

Cumulative impacts:

- No impact

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1, A2 and A3

Upon decommissioning, the transformed lands should be seeded with an indigenous grass mix and an ongoing Alien Invasive Management Plan should be implemented.	

2.5. PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1 (preferred site)	**Alternative S2**
i. If Environmental Authorization is granted, the botanist undertaking the Vegetation Report (including second field visit) should assist the applicant with the rescue and relocation all red data plant species from the proposed cultivation footprint to the 300ha conservation area. ii. If Environmental Authorization is granted, the EAP should assist the applicant in the final on-the-ground placement of pivot irrigation schemes such that all mitigation specifications detailed in this report are adhered to. iii. An ECO with wetland experience should be appointed prior to commencement of activities. iv. The ECO should be conduct weekly audits while the wetland crossings and stabilization is undertaken. v. Thereafter, the ECO should conduct bi-annual audits of operations for the first 2 years. vi. Audit reports should be compiled after every visit and submitted to the DEDTEA: Compliance, Enforcement and Monitoring component.	

Alternative A1 (Preferred Option) and A2 and A3

3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative S1 (preferred site)

It is important to assess an application holistically, addressing the social, economic and environmental factors influencing the project. This context for Kopleegte Farm is summarized below -

1. Social considerations

The need and desirability for the development on Kopleegte Farm is measured against the contents of the IDP and SDF for the region and is found to align wholly within the ambit of these goals, objectives and spatial plans. The benefits of a technologically-advanced, environmentally-sound and productive operation include:

- Increased direct job opportunities on farm from 15 positions currently to 23 fulltime positions when operational;
- Ancillary development within agricultural sector - mechanics, consultants, fertilizer and seed representatives, transport, implements, machinery etc;
- Not less than minimal wage (likely to be more) for staff, improving the per capita earnings and benefitting the broader community; and
- Improved provision of a primary food source, for improved regional and national food security

The proposed Kopleegte site is found along the N3 corridor and would be consistent with the current activity and agricultural landuse. Sense of Place would in no way be altered.

2. Economic considerations

Commercial agriculture is a key economic sector in the Okhalamba Municipality. The long term vision of the Municipality hinges around the creation of an enabling environment of these key sectors: agriculture, tourism, education, health, commerce and trade. Environmental Authorization for the cultivation of grasslands on Kopleegte would create such an enabling environment that would promote socio-economic development.

The proposed developments are in line with the NSDP in spending on economic infrastructure in priority areas with potential for economic development, with development to serve the broader societies' needs equitably.

3. Environmental considerations

There are three potential detrimental impacts associated with the proposed cultivation on Kopleegte Farm, namely –

1) *Impact on heritage stone wallings and graves;*
2) *Degradation of wetland systems; and*
3) *Loss of virgin grassland*

Firstly - upon deeper investigation of the aforementioned natural resources through specialist study, it became apparent that the features are not in a pristine condition – but are degraded and already impacted. This lowered the overall significance of impacts of the proposed cultivation on heritage, wetland and vegetation resources. Furthermore, there is limited biodiversity within the area.

Secondly - it is the opinion of the EAP that potential impacts to 1) heritage resources, and 2) wetland systems have been satisfactorily mitigated to render these impacts acceptable. Mitigation measures are summarized below -

1) *Mitigating measures against impact on heritage resources*

- All stone wall heritage features would have a 5m buffer according to HIA specialist specification.
- All archaeological graves and graves dating to the last 100 years would also be afforded a 5m buffer between the grave edge and the form of demarcation.
- Buffers would be constructed of metal poles and be visible above the cultivated crop.

2) *Mitigating measures against degradation of wetland systems*

- Placement of cultivated lands near degraded wetland HGM units.
- A 30m buffer of indigenous vegetation would remain around wetlands
- The incidence of burning the veld within the buffer area would be reduced to once in every three years. This would allow the buffer to become denser – with the consequence of improving both biodiversity and water retention and yield. At the same time, if fertilisers do leach in from the croplands, the improved vegetation will lead to better removal of the phosphates and nitrates.
- All alien vegetation within wetlands would be removed and rehabilitated with representative wetland species.
- There would be one formal stream crossing to allow vehicular access across wetland area. This would likely be over existing constructed earth dam walls.
- Earthern constructions (crossings) would allow pivot wheels to cross the wetland; these would also retain water and sediment and stabilize the environment.
- Indigenous water-tolerant vegetation would be put in place below the crossing culverts in order to prevent erosion and scour.
- Active erosion head cut downstream of the old dam near the bottom end of the wetland would be stabilised. Rock pack or installation of stone-filled gabion baskets would be used.

3) The *loss of virgin grassland* is an undeniable and absolute loss which cannot be directly mitigated or compensated for, although specific mitigation measures have been put in place to minimize the direct impacts of the activity: such as plant rescue and relocation; alien invasive management; minimum -till farming practices; and buffers on wetlands.

However, the request to break virgin land needs to be seen in the light of the other gains for biodiversity, conservation and society which are well-documented in this report. The indirect and cumulative impact of the loss of virgin grasslands needs to be considered in the context of broader environmental gains that would come about as a result of this project. These are -

- Conservation of 300ha of KZN Highland Thornveld. This is an existing game farm area on the farm, comprising intact virgin grasslands and savannah habitats (see Appendix A2). The area is stocked with game and serves as an ecological corridor across the landscape. As a means of an offset for the loss of grasslands for cultivation, the applicant would like to explore opportunities for formal protection of this 300 ha game camp through the Biodiversity Stewardship Programme of EKZNW. The game camp would be actively managed to conservation standards with relevant conservation grazing and burning regimes.

- According to the Wetland Specialist report (Appendix D2), measures would be undertaken to rehabilitate and stabilize the large wetland system traversing the Kopleegte site.

On a balance of the impacts, it is the opinion of the EAP that the proposed application is found to be socially, economically and environmentally acceptable and desirable.

Alternative S2

Alternative A1 (preferred alternative)

Alternative A2

No-go alternative (compulsory)

Should the project not proceed, it is likely that either 1) the land would be left unattended (with the subsequent spread of alien invasive plants, poaching, fires etc); or that 2) the land would be bought by another proponent.

The current applicant has a proven track record of conservation efforts on the farm; with the current application showing that there is the same intent to conduct environmentally-sound practice.

Should the development not proceed, there would be no enhanced conservation status for the farm sought through the EKZNW BSP. There would also be no rehabilitation and stabilization of the wetland.

There would be no jobs created as a result of the crop production operation and no contribution to food security.

On a balance of the impacts, the No-Go option would render less gain that the proposed landuse option and is therefore undesirable.

SECTION F. RECOMMENDATION OF EAP

Is the information contained in this report and the documentation attached hereto in the view of the EAP sufficient to make a decision in respect of this report?
If "NO", please contact the KZN Department of Economic Development, Tourism & Environmental Affairs regarding the further requirements for your report.

YES	NO

If "YES", please attach the draft EMPr as Appendix F to this report and list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Considering all information gathered in the EIA process – including the project details, the site, the need and desirability, relevant environmental legislation, specialist findings and engineering input and comments from IAPs - the EAP makes the following recommendations that should be included as conditions of Environmental Authorization:

Commencement of activities

Should the application be approved, the following actions should be enforced prior to commencement of activities –

- The configuration for cultivation should be in alignment with the proposed cultivation layout plan (Appendix A4) allowing transformation of 98.95 ha.
- The botanist undertaking the Vegetation Report (including second field visit) should assist the applicant with the rescue and relocation all red data plant species on the development footprint.
- The EAP should assist the applicant in the final on-the-ground placement of pivot irrigation schemes such that all mitigation specifications detailed in this report are adhered to.
- An ECO with wetland experience should be appointed prior to commencement of activities. The ECO should be conduct weekly audits and support while the wetland crossings and stabilization is undertaken.

Holistic mitigation of impacts

Should the application be approved, the applicant should commit to the following –

- Formal Conservation of 300ha of KZN Highland Thornveld game camp area. The applicant should explore opportunities for formal protection through the Biodiversity Stewardship Programme.
- According to the Wetland Specialist report (Appendix D2), measures should be undertaken to rehabilitate and stabilize the large wetland system traversing the Kopleegte site.

Site-specific mitigation measures of listed activities

Should the application be approved, the applicant should commit to the following –

1. Breaking of virgin grassland (GNR 546, 14)

- The implementation of an Alien Vegetation Management Programme and reestablishment of indigenous vegetation in disturbed areas should be undertaken in the uncultivated portions of the land;

- All heritage sites should be afforded a 5m and excluded from the cultivation footprint;
- Cover crops should be planted in cultivated areas over winter to assist with soil erosion;
- All cultivation should be using 'Minimum-Till' methods;
- Wetlands should be buffered by 30m - cultivation should take place from the edge of this zone;
- Burning of veld in wetland buffers should be reduced to once in every three years; and
- Degraded wetland zones (HGM units D and E) should be stabilized to prevent soil wash.

2. Constructing wetland crossings (GNR 544, 18)

- There should be only one formal stream crossing to allow vehicular access across wetland area. This should be over existing constructed earth dam walls;
- Earthern constructions (crossings) should be constructed within HGM units D and E to allow pivot wheels to cross the wetland;
- Indigenous water-tolerant vegetation would be put in place below the crossing culverts in order to prevent erosion and scour;
- Active erosion head cut downstream of the old dam near the bottom end of the wetland should be stabilised; and
- All alien vegetation within wetlands should be removed and rehabilitated with representative wetland species.

The abovementioned mitigation measures should be incorporated as conditions of the Environmental Authorization.

APPENDICES

Appendix A Site Plans

A1 Locality Map
A2 Farm Layout
A3 Planning iterations of proposal (drafts)
A4 Proposed Cultivation Layout

Appendix B Site photographs

Appendix C Facility illustration

Appendix D Specialist Reports

D1 Soils Analysis
D2 Wetland Assessment
D3 Vegetation Assessment
D4 Heritage Impact Assessment

Appendix E Public Participation

E1 IAP register
E2 Background Information Document
E3 Proof of advertising: newspaper advertisements and site notices
E4 Comments and Response Report
E5 IAP comments received

Appendix F Draft Environmental Management Programme

Appendix G Other information

G1 Okhahlamba Municipality SDF