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DRAFT ENVIRONMENTAL IMPACT REPORT

Proposed cultivation of 765 ha virgin soil for the establishment of 17 Seed Potato Farming Pivots and associated water pipelines on the Farm Zulani No. 167 near Douglas, Northern Cape Province

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EXECUTIVE SUMMARY

The company Idstone Farming (Pty) Ltd. is proposing to commence with the process of procuring the Farm Zulani No. 167 near the town of Douglas in the Northern Cape Province (765 ha). The reason for the intended procurement is for establishing seventeen (17) 45 ha seed potato farming pivots on the farm of natural previously uncultivated land.

It has to be noted that the seed potato pivot preparation and planting/development phase will take approximately 8 years to be complete and will continue to follow an 8-year rotation cycle. In other words, not all pivots will be planted simultaneously. After each season, each pivot will be rehabilitated using buffalo grass and will remain dormant/inactive for a period of 7 years, before planting will again commence on the pivot. This cycle will continue.

Eco-Con Environmental (Pty) Ltd. was appointed by Idstone Farming (Pty) Ltd. as the independent Environmental Assessment Practitioner (EAP) to conduct a full Scoping & EIA process for the proposed project. Eco-Con Environmental was established in May 2017. Although the formal establishment of the company took place in 2017, it is backed by more than 15 years of collective professional service and experience in the environmental field. The qualifications, expertise and experience of our professional team form the backbone of the company's continued success.

NEMA LISTED ACTIVITIES TRIGGERED BY THE PROPOSED PROJECT

The development activities in the National Environmental Management Act (Act 107 of 1998): Environmental Impact Assessment Regulations, 2017 (Government Notices R327, R325 and R324 in Government Gazette No. 38282 of April 2017 which are triggered by the proposed project are listed in the table below:

Regulation	Activity	Description of trigger activity in proposed project
GN. R. 327 Listing Notice 1	**Activity 12** The development of – (i) infrastructure or structures with a physical footprint of 100 square metres or more where such development occurs – (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse	Approximately 17.5 km pipelines with a diameter ranging between 250 mm – 315 mm will be constructed to transport water from the extraction point in the Riet River. Sections of this pipeline (covering more than 100 square metres) will be constructed through and within 32 metres of existing watercourses.

Regulation	Activity	Description of trigger activity in proposed project
GN. R. 327 Listing Notice 1	**Activity 19** The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse	The additional pumping and piping infrastructure required to be installed for the proposed project at the water extraction point in the Riet River could potentially trigger this activity.
GN. R. 325 Listing Notice 2	**Activity 13** The physical alteration of virgin soil to agriculture, or afforestation for the purposes of commercial tree, timber or wood production of 100 hectares or more.	Cultivation and establishment of 17 seed potato pivots of approximately 765 ha of natural vegetation. The total size of the farm portion to be impacted by roads and associated infrastructure of the proposed project is approximately 765 ha.
GN. R. 325 Listing Notice 2	**Activity 15** The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	Cultivation and establishment of 17 seed potato pivots of approximately 765 ha of natural vegetation. The total size of the farm portion to be impacted by roads and associated infrastructure of the proposed project is approximately765 ha.
GN. R. 324 Listing Notice 3	**Activity 4** The development of a road wider than 4 metres with a reserve less than 13,5 metres. (G) In the Northern Cape provinces: (ii) Outside urban areas, in: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans	A portion of the site falls inside a Critical Biodiversity Area and associated gravel access roads wider than 4 m will be established in and around the proposed pivots.
GN. R. 324 Listing Notice 3	**Activity 12** The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with the maintenance management plan.	The site falls inside a Critical Biodiversity Area and cultivation and establishment of 17 seed potato pivots of approximately 765 ha of natural vegetation.

Regulation	Activity	Description of trigger activity in proposed project
	(G) In Northern Cape: (ii) Within critical biodiversity areas identified in bioregional plans	The total size of the farm portion to be impacted by roads and associated infrastructure of the proposed project is approximately 765 ha.
GN. R. 324 Listing Notice 3	**Activity 14** The development of – (ii) infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs— (A) Within a watercourse- (G) In Northern Cape (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional Plans	The additional pumping and piping infrastructure required to be installed for the proposed project at the water extraction point in the Riet River could exceed 10 m² in size.

PROJECT LOCATION

The proposed project area is approximately 765 ha in surface size and is situated on the Remaining extent of Farm Zulani 167 (SG 21 Digit Code: C03700000000016700000) extending approximately 1850 ha. The proposed water pipeline will also be located on the above property and will not traverse any other portions or farms. The farm is located approximately 42km outside the town of Douglas towards Kimberley. The property falls inside the Siyancuma local Municipality which, in turn, forms part of the greater Pixley Ka Seme District Municipality. Access to the proposed project area is obtained by way of the R 357 provincial road as the farm is situated directly to the South of the R 375 provincial road.

NEEDS AND DESIRABILITY OF THE PROJECT

Various key factors must be taken into consideration as motivation/incentive for the potential benefits involved with the proposed project. The Remaining extent of the Farm Zulani 167 is currently of little economic value due to low grazing capacity for livestock purposes. Should the portion not be developed and efficiently utilised, the economic value will stay low. The development of seed potatoes on the farm will significantly increase the agricultural potential of the property, which will in turn increase the economic value. Construction

and operational phase job creation (local employment) and sustainable capacity building (skills, experience and resources development) of this project will aid in immediate and continuous local community upliftment and poverty alleviation and are therefore regarded as significant socio-economic benefits associated with the proposed project to motivate the need and desirability. The outcomes of this project are also in line with the requirements and objectives of the National Development Plan; Northern Cape Provincial Spatial Development Framework; Northern Cape Provincial Growth and Development Strategy as well as the Siyancuma local Municipality and Pixley Ka Seme District Municipality Integrated Development Plans.

ALTERNATIVES CONSIDERED

Site / Property Alternatives

The applicant owns a number of farms within a surrounding 45 km region of the proposed three development areas. The overwhelming majority of the undeveloped farms owned by the applicant either fall within a Critical Biodiversity Area one (CBA 1) or Critical Biodiversity Area two (CBA 2) in accordance with the NCSBP. A minor portion of the farms to the north owned by the applicant falls within Ecological Support Areas (ESA) or Other Natural Areas (ONA) in accordance with this Plan.

The majority of the undeveloped farms owned by the applicant either fall within the Kimberley Thornveld (SVk 4) or Vaalbos Rocky Shrubland (SVk 5) vegetation types. The Kimberley Thornveld vegetation type (SVk 4) is mainly associated with the nesting habitat and foraging grounds of the critically endangered Red Data Listed bird species *Gyps africanus* (African white-backed vulture) as well as suitable habitat and soil conditions for the presence of the nationally protected tree species *Vachellia erioloba* (Camel thorn) & *Vachellia haematoxylon* (Grey camel thorn). Only small isolated portions of a number of farms owned by the applicant, which are traversed by significant watercourses, fall within the Upper Gariep Alluvial vegetation type (Aza 4). These portions however all either fall within a Critical Biodiversity Area two (CBA 2) or Critical Biodiversity Area one (CBA 1).

From an alternative site / property location point of view for the proposed developments, it is therefore evident that the applicant has limited options for developing on other sites/farms which would avoid or limit ecological impacts on CBAs or protected/Red Data Listed species.

Therefore, given the significance of residual impacts and scope for mitigation, it is recommended that Alternative 2 for the Remaining Extent of the Farm Zulani no 167 be considered for development due to those alternatives mostly falling outside the CBA 2 and constituting relatively smaller development footprints. Pursuing these options would ensure that the direct footprint impact on the ecologically sensitive CBA 2 is avoided as far as practicably possible. It would also ensure that a proportion of the direct footprint impact on

the nesting habitat and foraging grounds of critically endangered birds and on nationally protected trees could be avoided.

Layout Alternatives

During the scoping phase of the project three layout alternatives have been evaluated, however, due to valuable progress made on one of the applicant other projects, the layouts for the proposed development have changed to only two layout alternatives which differ slightly from the ones evaluated in the scoping phase. It has to be noted that although the layouts have changed slightly, the area in which the development will take place, remains exactly the same. In other words, some minor internal layouts have changed as per description below.

Layout Alternative 1 (Preferred Layout Alternative)

The Preferred Layout alternative (Alternative 1) includes the development of seventeen (17) 45 ha seed potato pivots. Twelve (12) of the proposed 45ha pivots are located to the Northern part of the remaining Extent of the Farm Zulani 167 which is located outside the Critical Biodiversity Area 2, while five (5) of the proposed 45ha pivots are located to the centre-left and south of the development area which is located in a Critical Biodiversity Area 2.

Zulani Preferred Alternative (Alternative 1)

Layout Alternative 2

Layout Alternative 2 includes the development of fourteen (14) 45 ha seed potato pivots. Twelve (12) of the proposed 45ha pivots are located to the Northern part of the remaining Extent of the Farm Zulani 167 which is located outside the Critical Biodiversity Area 2, while two (2) of the proposed 45ha pivots are located to the centre-left of the development area which is located in a Critical Biodiversity Area 2.

Zulani Alternative 2

PUBLIC PARTICIPATION PROCESS

A continual and comprehensive Public Participation Process (PPP) was undertaken throughout the entire Scoping & EIA process with all stakeholders and Interested and Affected Parties (I & AP's), including the relevant organs of state and competent authority (Northern Cape Department of Environment and Nature Conservation) as identified during the Scoping Phase. The PPP was conducted in accordance with the requirements of Regulation 41 of the EIA Regulations, 2017 and the designated Public Participation Officer will ensure that the PPP is facilitated in a manner which ensures reasonable opportunity for all stakeholders and registered I & AP's to comment and provide input on the proposed project.

A summary of comment received during the scoping phase of the project, is listed under Table 15

ENVIRONMENTAL IMPACT ASSESSMENT

Planning, Design and Construction Phase

PLANNING, DESIGN AND CONSTRUCTION PHASE					
Potential Flora Impacts:					
Nature of impact: Direct impact on Flora as a result of the Transformation of terrestrial vegetation on the proposed project footprint				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium – High (MH)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Nature of impact: Direct impact on Flora as a result of the Transformation of a Critical Biodiversity Area two (CBA 2)				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	High (H)	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Low (L)
Cumulative impact:	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Low (L)
Nature of impact: Direct impact on Flora as a result of the Destruction/damage to Red Data Listed, nationally or provincially protected species individuals				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Very High V(H)	Medium – High (MH)	High (H)	Medium – High (MH)	Low (L)
Cumulative impact:	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Low (L)
Nature of impact: Direct impact on Flora as a result of Alien invasive species establishment				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Avifauna Impacts:					
Nature of impact: Direct impact on White-backed Vultures *(Gyps africanus)* as a result of vegetation clearance transforming the foraging area				**Activity:** Proposed development of seed potato pivots	
	Preferred Layout Alternative		**Layout Alternative 2**		

Evaluation Component:	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	No-Go Alternative
Significance rating:	Very High (VH)	High (H)	Very High (VH)	High (H)	Low (L)
Cumulative impact:	High (H)	High (H)	High (H)	High (H)	Low (L)
Nature of impact: Direct impact on White-backed Vultures *(Gyps africanus)* as a result of vegetation clearance transforming the breeding habitat				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Very High (VH)	High (H)	Very High (VH)	High (H)	Low (L)
Cumulative impact:	High (H)	High (H)	High (H)	High (H)	Low (L)
Nature of impact: Direct impact on other avifaunal species as a result of vegetation clearance transforming the breeding habitat				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium-high (MH)	Medium (M)	Medium-high (MH)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Nature of impact: Direct impact on other avifaunal species as a result of vegetation clearance transforming the foraging area				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Potential Fauna Impacts:					
Nature of impact: Direct impact on other faunal species as a result of vegetation clearance transforming the breeding habitat				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium-high (MH)	Medium (M)	Medium-high (MH)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Nature of impact: Direct impact on other faunal species as a result of vegetation clearance transforming the foraging area				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)

Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Potential Dust Impacts:					
Nature of impact: Dust nuisance generated during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Noise Impacts:					
Nature of impact: Noise nuisance generated during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Cultural and Heritage Impacts:					
Nature of impact: Damage and destruction of vertebrate fossils during excavation activities.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Surface and Groundwater Contamination Impacts:					
Nature of impact: Surface and Groundwater Contamination during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Nature of impact: Impeding and contamination of the surface water catchment and drainage area towards the Riet River.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)

Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Potential Waste Management Impacts:					
Nature of impact: Waste impacts by means of waste storage and littering during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Traffic Impacts:					
Nature of impact: Traffic impacts by means of additional truck and transportation to and from site during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Fire Risk Impacts:					
Nature of impact: Increase risk of fires during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Medium (M)
Potential Soil Contamination Impacts:					
Nature of impact: Increased Soil contamination by means of hazardous substances.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Soil Erosion Impacts:					
Nature of impact: Increased Soil erosion due to construction activities.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)

Cumulative impact:	Medium (M)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Visual Impacts:					
Nature of impact: Increased visual impact due to increased working activities on-site.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Socio-Economic Impacts:					
Nature of impact: Increased socio-economic conditions due to job creation+				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	+ Medium (M)	+ Medium-high (MH)	+ Medium (M)	+ Medium-high (MH)	Medium (M)
Cumulative impact:	+ Medium (M)	+ Medium (M)	+ Medium (M)	+ Medium (M)	Medium (M)

Operational Phase

OPPERATIONAL PHASE					
Potential Flora Impacts:					
Nature of impact: Impeding of the ecological connectivity and functionality of the broader remaining natural corridor.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Nature of impact: Direct impact on flora as a result of Alien Invasive Species Establishment.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Fauna and Avifauna Impacts:					
Nature of impact: Continuous impact on Fauna and Avifauna as a result of cleared alien invasive species establishment.				**Activity:** Proposed development of seed potato pivots	

Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Dust Impacts:					
Nature of impact: Dust nuisance generated during the operational phase of the project.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Noise Impacts:					
Nature of impact: Noise nuisance generated during the operational phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Cultural and Heritage Impacts:					
Nature of impact: Damage and destruction of vertebrate fossils during the operational phase.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Surface and Groundwater Contamination Impacts:					
Nature of impact: Surface and Groundwater Contamination during the operational phase by means of fertilizer and/or any other hazardous substances or pesticides.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Nature of impact: Impeding and contamination of the surface water catchment and drainage area towards the Riet River.				**Activity:** Proposed development of seed potato pivots	
	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative

Evaluation Component:	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Potential Waste Management Impacts:					
Nature of impact: Waste impacts by means of waste storage and littering during the operational phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Traffic Impacts:					
Nature of impact: Traffic impacts by means of additional truck and transportation to and from site during the operational phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Fire Risk Impacts:					
Nature of impact: Increase risk of fires during the operational phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Medium (M)
Potential Soil Contamination Impacts:					
Nature of impact: Increased Soil contamination by means of hazardous substances.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Potential Soil Erosion Impacts:					
Nature of impact: Increased Soil erosion due to operational activities.				**Activity:** Proposed development of seed potato pivots	
	Preferred Layout Alternative		**Layout Alternative 2**		**No-Go Alternative**

Evaluation Component:	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Low (L)	Low (L)	Low (L)

Potential Visual Impacts:	
Nature of impact: Increased visual impact due to increased working activities during the operational phase.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Potential Water Usage Impacts:	
Nature of impact: Impact on water usage due to over extraction from the Riet River.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)

Potential Socio-Economic Impacts:	
Nature of impact: Increased socio-economic conditions due to job creation	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	+ Medium (M)	+ Medium-high (MH)	+ Medium (M)	+ Medium-high (MH)	Medium (M)
Cumulative impact:	+ Medium (M)	+ Medium (M)	+ Medium (M)	+ Medium (M)	Medium (M)

Decommissioning Phase

DECOMMISION PHASE	
Potential Dust Impacts:	
Nature of impact: Dust nuisance generated during the decommissioning phase of the project.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Potential Surface and Groundwater Contamination Impacts:					
Nature of impact: Surface and Groundwater Contamination during the decommissioning phase by means of fertilizer and/or any other hazardous substances or pesticides.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Potential Waste Management Impacts:					
Nature of impact: Waste impacts by means of waste storage and littering during the decommissions phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Potential Soil Contamination Impacts:					
Nature of impact: Increased Soil contamination by means of hazardous substances.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Potential Soil Erosion Impacts:					
Nature of impact: Increased Soil erosion due to decommissioning activities.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Medium (M)

Potential Socio-Economic Impacts:					
Nature of impact: Increased socio-economic conditions due to job loss				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	+ Medium (M)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	+ Medium (M)

SUMMARY OF SPECIALIST STUDIES

The section below outlines the main finding of all specialists involved in the Scoping & EIA process. More detailed insight may be gathered from the specialist report which is attached as Appendix E.

Ecological and Wetland Specialist study

It is the opinion of the specialist that, by application of the NEMA Mitigation Hierarchy, the significance of residual impacts associated with transformation of the CBA 2 and destruction of nationally protected tree species and critically endangered bird species habitat cannot be suitably reduced and mitigated to within acceptable levels for Alternative 1. This must therefore be seen as a fatal flaw for the proposed Alternative 1 and it is therefore not recommended that Alternative 1 be considered.

Although Alternative 2 will result in the most southerly situated three pivot lands of the southern development portion of the proposed project associated with the CBA 2 being left in situ and therefore not being significantly impacted upon, the significant presence of nationally protected tree species and the presence of the critically endangered African white-backed vulture habitat within Alternative 2 will still pose a significant residual impact. The two most southerly situated pivot lands of Alternative 2 are also associated with the CBA 2 but due to their significant distance away from the Riet River, these two pivot lands are not necessarily regarded as forming an integral part of the ecological corridor associated with the Riet River catchment and riparian zone relative to the three most southerly situated pivot lands.

By application of the NEMA Mitigation Hierarchy, the significance of residual impacts cannot be adequately mitigated to within acceptable levels other than investigating the potential implementation of an ecological offset as mitigation. The only potentially suitable mitigation option would be for the applicant to make available a suitable ecological offset area which can be formally protected in order to compensate for the significant destruction of the CBA 2, nationally protected tree species and nesting sites and foraging grounds of the critically endangered species.

It is recommended that Alternative 2 be considered due to the smaller impact footprint. If Alternative 2 is considered, the applicant must make available a suitable ecological offset area which can be formally protected in order to compensate for the transformation of the proposed project area. A comprehensive Offset Feasibility Assessment and Report will have to be conducted and compiled in order to identify and inform on an area of suitable size and ecological value which could meaningfully contribute to the regional and provincial biodiversity management requirements and strategies. The proposed Offset Feasibility Assessment and Report will have to be evaluated by the relevant departments in order to inform on their approval/rejection process.

Avifaunal Specialist study

The discrete habitats within the study area support a variety of bird species, with approximately 155 with a high to medium occurrence probability, of which six threatened and/or near threatened avifaunal species are likely to recur and/or be resident. The following findings were made for each of the associated habitat units within the larger study area.

- **Agricultural:** As a result of the lack of suitable breeding habitat for threatened/near threatened avifauna, as well as the numerous disturbances associated with agricultural activities, this habitat unit was deemed to have a low avifaunal sensitivity.
- ***Senegalia mellifera dominated Alluvial Vegetation***: No suitable breeding habitat for threatened/near threatened bird species were observed on site, although the habitat might be suitable in terms of foraging and hunting for certain threatened and near threatened species such as Lanner Falcons, Kori Bustard and Ludwig's Bustard. On account of the near natural state of this habitat unit together with the overall high avifaunal species composition, this study unit was deemed moderately sensitive from an avifaunal perspective.
- ***Vachellia erioloba dominated Savanna***: On account of this habitat unit's connectivity function, the optimal habitat for threatened and near threatened bird species, the natural state of the habitat and unique species composition, it was deemed to be highly sensitive from an avifaunal perspective. Furthermore, six active White-backed Vulture nests were recorded within the habitat unit, with a high probability that more nests could be present. This augments the sensitivity of this habitat unit.

Heritage Specialist study

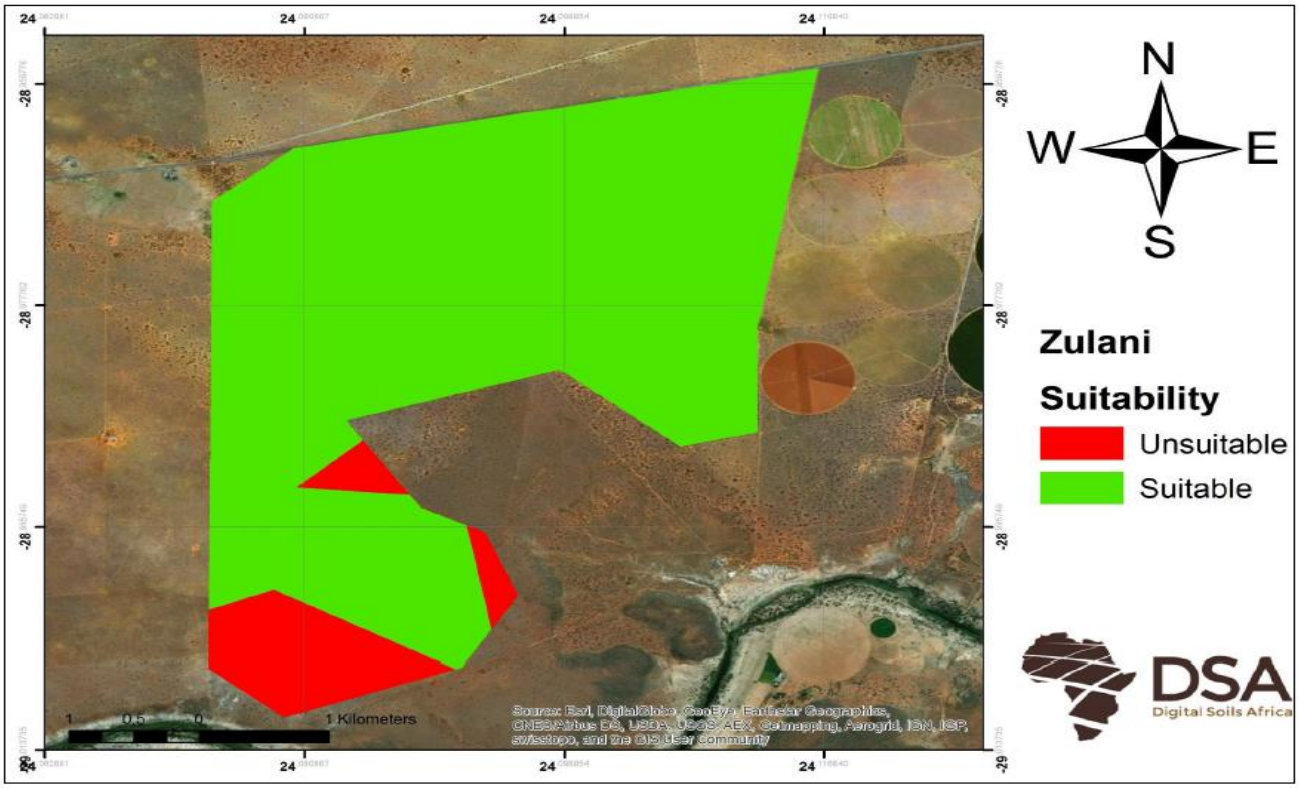
The study area is located within a historically as well as prehistorically significant landscape. However, the field assessment indicates that the proposed pivot development will primarily affect geologically recent soils in the form of well-developed wind-blown sand. The base of aeolian Kalahari Group sands, which cover vast areas in the region, have previously produced localized densities of Early and Middle Stone Age artifacts, but given that pivot farming largely effect the uppermost soil layer, impact on potentially intact Stone Age archaeological remains within the footprint is considered unlikely. Given the nature of the proposed development (installation of aboveground pivots), the terrain is not considered archaeologically vulnerable and is assigned a site rating of Generally Protected C.

Soil Suitability Study

On the Remaining Extent of the farm Zulani No. 167, the Hutton soil form covers the largest part of the site, but gives way to Plooysburg, Addo and Prieska soils in the south. Small parts of the Prieska and Plooysburg soil forms are also present near the middle of the site.

The freely drainable depth is the depth up to where the water can freely drain. It includes the depth of the orthic A, red apedal B, yellow brown apedal B and neocarbonate B horizons. The drainable depth is the same as the freely drained depth, with the exception of 200 mm added when a soft carbonate is the limiting layer, to accommodate potential infiltration into the soft carbonate horizon. Where no limiting layer was reached, the freely drainable depth and drainable depth was regarded as greater than 2 000 mm. In general, the soils of Zulani are very deep, and is good for irrigation. The soil at Zulani is shallower in the south of the site, as well as at a few spots near the middle of the site.

Based on soil morphology and laboratory analysis, the following areas are considered suitable for irrigation. For ease of monitoring, the areas are created in right shapes as seen on the image below.



Suitable Irrigation soil at Zulani

Ecological Offset Report study conducted during the Impact Assessment Phase

It is recommended that Alternative 2 for the Remaining Extent of the Farm Zulani no 167 be considered for the proposed developments. This alternative mainly fall outside the Critical Biodiversity Area two (CBA 2) area and have relatively small direct impacts. In the case of this Alternative 2 the proposed development is unlikely to lead to direct and permanent destruction of irreplaceable or near-irreplaceable biodiversity as no critically endangered bird individuals will be killed, in which case it would have constituted a fatal flaw. The proposed development will however lead to some loss of CBA 2 area, significant loss of protected tree species as well as the permanent destruction of significant nesting habitat (although not necessarily unique) and subsequent displacement of a number of critically endangered birds. These residual negative impacts need to be remedied in order to satisfy the NEMA principles.

CONCLUSION

In conclusion, there are a number of ecologically and avifaunal significant issues to be addressed in the proposed project (mainly protected species management). **These ecological and avifaunal impacts can be regarded as "red-flag" impacts**.

It is in the opinion of the EAP that, by application of the NEMA Mitigation Hierarchy, the significance of residual impacts associated with transformation of the CBA 2 and destruction of nationally protected tree species and critically endangered bird species habitat cannot be suitably reduced and mitigated to within acceptable levels for Alternative 1. This must therefore be seen as a fatal flaw for the proposed Alternative 1 and it is therefore not recommended that Alternative 1 be considered.

Although Alternative 2 will result in the most southerly situated three pivot lands of the southern development portion of the proposed project associated with the CBA 2 being left in situ and therefore not being significantly impacted upon, the significant presence of nationally protected tree species and the presence of the critically endangered African white-backed vulture habitat within Alternative 2 will still pose a significant residual impact. The two most southerly situated pivot lands of Alternative 2 are also associated with the CBA 2 but due to their significant distance away from the Riet River, these two pivot lands are not necessarily regarded as forming an integral part of the ecological corridor associated with the Riet River catchment and riparian zone relative to the three most southerly situated pivot lands.

By application of the NEMA Mitigation Hierarchy, the significance of residual impacts cannot be adequately mitigated to within acceptable levels other than investigating the potential implementation of an ecological offset as mitigation. The only potentially suitable mitigation option would be for the applicant to make available a suitable ecological offset area which can be formally protected in order to compensate for the

significant destruction of the CBA 2, nationally protected tree species and nesting sites and foraging grounds of the critically endangered species.

It is recommended that Alternative 2 be considered due to the smaller impact footprint. If Alternative 2 is considered, the applicant must make available a suitable ecological offset area which can be formally protected in order to compensate for the transformation of the proposed project area. A comprehensive Offset Feasibility Assessment and Report will have to be conducted and compiled in order to identify and inform on an area of suitable size and ecological value which could meaningfully contribute to the regional and provincial biodiversity management requirements and strategies. The proposed Offset Feasibility Assessment and Report will have to be evaluated by the relevant departments in order to inform on their approval/rejection process

In the opinion of the EAP, the declaration and management of the identified properties as a Nature Reserve or Protected Environment in accordance with the NEMPAA requirements, satisfy the offset requirement for the proposed development and remedy their significant residual ecological impacts. The proposed developments should therefore be considered by the competent authority for environmental authorisation and approval.

If the Environmental Authorisations for the proposed development is approved, it is recommended that an official offset agreement negotiation meeting between the applicant and state conservation authority be conducted as soon as practicably possible. The objective of this meeting must be to finalise the offset agreement and obtain the applicant's consent and intent to declare a Nature Reserve or Protected Environment in terms of the NEMPAA. A number of recommendations are made for conditions to be included in the Environmental Authorisation; some of these conditions would be suspensive, depending on requirements being met before any listed activities could commence.

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ABBREVIATIONS

BA	Basic Assessment
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CEL	Cost Estimate Letter
CIA	Cumulative Impact Assessment
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CPA	Communal Property Association
CRR	Comments and Responses Report
CSP	Concentrated Solar Power
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DENC	Department of Environment and Nature Conservation
DM	District Municipality
DMR	Department of Mineral Resources
DoE	Department of Energy
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
FSR	Final Scoping Report
Ha	Hectares
HTF	Heat Transfer Fluid
I & APs	Interested and Affected Parties
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality
LSA	Late Stone Age

MAP	Mean Annual Precipitation
MASL	Metres Above Sea Level
MLL	Minimum living level
MSA	Middle Stone Age
MVA	Megavolt ampere
MW	Megawatt
NCPSDF	Northern Cape Provincial Spatial Development Framework
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NERSA	National Energy Regulator of South Africa
NFA	National Forests Act (Act 84 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NIP	National Infrastructure Plan
NWA	National Water Act (Act 36 of 1998)
PFS	Pre-feasibility Study
PPP	Public Participation Process
PUC	Point of Utility Connection
PoSEIA	Plan of Study for Environmental Impact Assessment
REIPPP	Renewable Energy Independent Power Producers Procurement Programme
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIP	Strategic Integrated Project
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
VIA	Visual Impact Assessment
WRYCM	Water Resource Yield Computer Model
WULA	Water Use Licence Application

1. INTRODUCTION

The agricultural industry forms a significant part of the annual GDP of the Republic of South Africa. Agriculture primarily contributes in the form of food national production and security and through import and export process as well as primary and secondary employment creation.

The company Idstone Farming (Pty) Ltd. is proposing to commence with the process of procuring the Farm Zulani No. 167 near the town of Douglas in the Northern Cape Province (765 ha). The reason for the intended procurement is for establishing Seventeen (17) 45 ha seed potato farming pivots on the farm of natural previously uncultivated land.

It has to be noted that the seed potato pivot preparation and planting/development phase will take approximately 8 years to be complete and will continue to follow an 8-year rotation cycle. In other words, not all pivots will be planted simultaneously. After each season, each pivot will be rehabilitated using buffalo grass and will remain dormant/inactive for a period of 7 years, before planting will again commence on the pivot. This cycle will continue.

The completion of the farm portion procurement process is however dependent on a number of factors. The major conditional factors are the suitability of the area for seed potatoes (soil, water, transformation of natural resources, heritage significance) as well as the successful acquisition of an environmental authorisation (EA) from the competent authority. The Northern Cape Department of Environment and Nature Conservation has in this case been identified as the competent authority.

In accordance with the National Environmental Management Act (Act 107 of 1998); Environmental Impact Assessment Regulations of 2017, a full Scoping & Environmental Impact Assessment (EIA) processes is required for the proposed project in order to obtain the necessary environmental authorisation from the competent authority. Eco-Con Environmental was appointed by the owner of Idstone Farming (Pty) Ltd. to act as the independent Environmental Assessment Practitioner (EAP) to facilitate the entire environmental authorisation application process and complete the full Scoping & EIA processes for the construction and operational phases of the proposed project.

The following report aims to give context to the proposed development through providing a comprehensive description of the envisaged activities and relevant infrastructure; the identification of significant environmental impacts associated to the proposed project; identification of appropriate alternatives and mitigation measures for reduction of undesired impacts; and communication of results in a clear and concise manner to the competent authority and other relevant parties.

1.1 PROJECT APPLICANT INFORMATION

Table 1: Project applicant information

Company/entity name:	Idstone Farming (Pty) Ltd
Registration number:	95/10916/07
Physical address:	3 Ortlepp Street, Kimberley, 8301
Postal address:	Box 110535, Hadison Park, 8306
Contact person:	Mr. Frank Lawrence
ID number:	5302145019084
Designation:	Owner
Contact number:	082 568 4615
E-mail address:	lawrencefrank@gmail.com

2. ENVIRONMENTAL ASSESSMENT PRACTITIONER

2.1 DETAILS OF THE EAP

Eco-Con Environmental (Pty) Ltd. was appointed by Idstone Farming (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to conduct a full Scoping & EIA process for the proposed project.

Eco-Con Environmental was established in May 2017. Although the formal establishment of the company took place in 2017, it is backed by more than 15 years of collective professional service and experience in the environmental field. The qualifications, expertise and experience of our professional team form the backbone of the company's continued success.

The vision of Eco-Con Environmental is being dedicated to environmental management that fosters a sustainable future and leads to improvements in the communities where we do business. Eco-Con Environmental believes that in time we will become the most respected Environmental Management Consultancy firm in all regions were we work.

The company continuously engages existing and emerging legislation, guidelines and practices in order to ensure the execution of high quality and appropriate studies. Through an integration of skills and expertise, it is envisioned that Eco-Con Environmental will deliver exceptional, competitive services for task execution and to meet deliverables. Eco-Con Environmental, through years of experience and industry presence, assures the seamless execution and roll out of tasks to achieve projected results on time. Our past experience on agricultural projects further benefits our understanding of the required and associated processes and the impacts thereof.

Table 2: Details of the EAP

Company/entity name:	Eco-Con Environmental (Pty) Ltd.
Physical address:	5 Chris Barnard Street, Langenhovenpark, Bloemfontein, 9301
Postal address:	P.O Box 37452, Langenhovenpark, 9330
Contact person:	Mr. Johan Botes
Designation:	Senior Environmental Consultant and Managing Director
Contact number:	082 459 8206
E-mail address:	johan@eco-con.co.za
Qualifications:	B.A Honours in Geography – UFS B.A Geography and Environmental Management - UFS

2.2 EXPERTISE OF THE EAP REPRESENTATIVE

Johan Botes, is a Senior Environmental Specialist Consultant and Managing Director at Eco-Con Environmental (Pty) Ltd. His qualifications include an Honours degree in Geography from the University of the Free State and a Bachelors of Arts in Geography and Environmental Management also from the University of the Free State. Johan Botes has 7 years of environmental management experience. Johan also brings with him a strong background in environmental law and monitoring. He was previously employed at Enviroworks and Savannah Environmental Consultants as a General Manager and Environmental Control Officer respectively.

Relevant Project Experience

Project Management Experience

- Conducting of Environmental Impact Assessment Report for the proposed 45MW Meerkat Hydro Power Facility in the Northern Cape.
- Conducting of Environmental Impact Assessment Report for the proposed 150MW PV Metsimatala Solar Power Project in the Northern Cape.
- Conducting of Basic Assessment processes for the proposed Optic fibre cable installation in and around the town of Lephalale on behalf of NEOTEL.
- Conducting of Basic Assessment processes for the proposed Optic fibre cable installation in and around the town of Thohoyandou on behalf of NEOTEL.
- Conducting of Basic Assessment processes for the proposed Optic fibre cable installation in and around the town of Groblersdal on behalf of NEOTEL.
- Conducting of Basic Assessment processes for the proposed upgrading and widening of Nathen Bridge in Blomfontein on behalf of the Mangaung Metropolitan Municipality
- Conducting of Basic Assessment processes for the proposed construction of two new roads and the upgrading of one existing road in Botshabeo on behalf of the Mangaung Metropolitan Municipality.

Environmental Impact Assessment Experience

- Conducting of Environmental Impact Assessment Report for the proposed 180 hectare Cecilia Park Residential development in Bloemfontein on behalf of Mzansi Africa Civils Engineering.
- Conducting of Environmental Impact Assessment Report for the proposed construction of a steel galvanizing plant in Botshebelo, Free State Province on behalf of Bombenero Investments.
- Conducting of Environmental Impact Assessment Report for the proposed opening of 3 borrow pits and 1 gravel quarry around the Ladybrand area, Free State Province.

Basic Assessment Experience

- Conducting of Basic Assessment report for the proposed construction of the Lucas Steyn Filling station in Bloemfontein, Free State Province.
- Conducting of Basic Assessment report for the proposed construction of Gabions in the Bath River in Caledon, Western Cape Province.
- Conducting of Basic Assessment report for the proposed expansion of the Nicsha Petroleum Depot in Bloemfontein, Free State Province.
- Conducting of Basic Assessment report for the proposed Fuel Zone Petroleum Depot in Welkom, Free State Province.
- Conducting of Section 24 G Rectification application for the already established residential development on the farm Proteahof 217, Delportshoop, Northern Cape.
- Conducting of Basic Assessment processes for the proposed opening of 9 borrow pits around the Ladybrand area, Free State Province.
- Conducting of Basic Assessment processes for the proposed Optic fibre cable installation between Prince Albert and Oudtshoorn on behalf of NEOTEL.
- Conducting of Basic Assessment report for the proposed Nooitgedach Retirement Village in White River, Mpumalanga.
- Conducting of Basic Assessment processes for the proposed construction of 19 signalling masts in the railway reserves of Cape Town and Stellenbosch on behalf of the Passenger Rail Association of South Africa (PRASA).
- Conducting of Basic Assessment processes for the proposed construction of 1 signalling mast in the railway reserve at St James Station, Cape Town on behalf of the Passenger Rail Association of South Africa (PRASA).
- Conducting of Basic Assessment processes for the proposed construction of 1 signalling mast in the railway reserve at Clovelly Station, Cape Town on behalf of the Passenger Rail Association of South Africa (PRASA).
- Conducting of Basic Assessment processes for the proposed upgrading and widening of Nathen Bridge in Bloemfontein on behalf of the Mangaung Metropolitan Municipality.
- Conducting of Basic Assessment processes for the proposed construction of two new roads and the upgrading of one existing road in Botshabeo on behalf of the Mangaung Metropolitan Municipality.

Experience in Auditing and as an Environmental Control Officer

- Annual Environmental Audit in Terms of Section 34 of Government Notice 982 for the Mission Point Mining near Sasolburg, Free State Province.

- Environmental Gap Audit for the Meadow Meats Abattoir in Vryheid, KwaZulu-Natal.
- Environmental Gap Audit for the Meadow Meats Abattoir in Wesselbron, Free State Province.
- Environmental Control Officer (ECO) for the Mission Point Sand Mining facility near Sasolburg, Free State Province.
- Environmental Control Officer (ECO) for the Rooikraal Truck stop facility near Vrede, Free State Province.
- Environmental Control Officer (ECO) for the widening of bridge structures over the Orange River for BVi on behalf of SANRAL, near Hopetown, Northern Cape
- Environmental Control Officer (ECO) for the construction of a 2.7 km Bus route, Thaba Nchu, Free State Province.
- Environmental as an Environmental Control Officer (ECO) for the installation of optic fibre cables in and around the town of Nelspruit on behalf of NEOTEL.
- Environmental as an Environmental Control Officer (ECO) for the construction of the Khi Solar One Concentrated Solar Power facility near Upington.
- Environmental as an Environmental Control Officer (ECO) for the construction of a 132kV Substation in Bloemfontein for Dihlase Consulting Engineers.
- Environmental as an Environmental Control Officer (ECO) for the installation of optic fibre cables in and around the town of Thohoyandou on behalf of NEOTEL.
- Environmental as an Environmental Control Officer (ECO) for the installation of optic fibre cables in and around the town of Lephaale on behalf of NEOTEL.
- Environmental as an Environmental Control Officer (ECO) for the installation of optic fibre cables in and around the town of Grobersdal on behalf of NEOTEL.
- Environmental as an Environmental Control Officer (ECO) for the installation of optic fibre cables in and around the town of Kathu on behalf of NEOTEL.

Experience in Permits and Licencing

- Water Use Licence Application for the installation of carbon optic fibre cable within 32 metres of a watercourse on behalf of NEOTEL.
- Water Use Licence Application (General Authorisation) for the installation of carbon optic fibre cable within 500 metres of a wetland on behalf of NEOTEL.
- Waste Management Licence for the storage and reuse of hazardous waste water for the Bombenero Galvanizing Steel Facility in Botshabelo, Free State Province on behalf of Bombenero Investments.

Experience in Environmental Risk Assessments

- Conducting of Environmental Risk Assessment for the proposed establishment of a Diesel Depot in Welkom, Free State Province.
- Compiling Environmental Risk Assessment for the proposed optic fibre cable installation in and around the town of Groblersdal on behalf of NEOTEL.
- Compiling Environmental Risk Assessment for the proposed optic fibre cable installation in and around the town of Lephalale on behalf of NEOTEL.
- Compiling Environmental Risk Assessment for the proposed optic fibre cable installation in and around the town of Thohoyandou on behalf of NEOTEL.
- Compiling Environmental Risk Assessment for the proposed optic fibre cable installation in and around the town of Nelspruit on behalf of NEOTEL.
- Compiling Environmental Risk Assessment for the proposed optic fibre cable installation in and around the town of Kathu on behalf of NEOTEL.
- Compiling Environmental Risk Assessment for the proposed optic fibre cable installation in and around the town of Groblersdal on behalf of NEOTEL

Other Experience

- Compilation of Fire Management Plan for the Proposed 150MW Metsimatale CSP Facility, Postmansburg, Northern Cape.
- Calculating Financial Provisions (Quantum Calculations) for the Mission Point Mining near Sasolburg, Free State Province.
- Compilation of construction and operational phase Waste Management Plan for the proposed Cecilia Park Residential Development, Bloemfontein, Free State Province.
- Training of construction personnel and environmental advisory services for personnel of the Khi Solar One Concentrated Solar Power facility near Upington.
- GIS mapping and technical support for various projects, including the drawing of locality and sensitivity maps.
- Public participation processes and assistance to several projects.
- Compilation of Bitumen Waste Report for Penny Farthing Engineering, Venterstad, Eastern Cape.

See Appendix A for Curriculum Vitae of the EAP.

2.3 PUBLIC PARTICIPATION OFFICER

The entire Public Participation Process for the Scoping as well as EIA phases will also be conducted and coordinated by Mr. Johan Botes.

See Appendix A for Curriculum Vitae.

3. RELEVANT ENVIRONMENTAL LEGISLATION AND GUIDELINES

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

Section 24 of the Constitution of South Africa provides the main national legislative obligation towards sustainable environmental management and development. This section forms the foundation of all other subsequent environmental legislation and governance in South Africa. Section 24 states the following:

every person shall have the right -

(a) to an environment that is not harmful to their health nor well-being; and

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

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

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

The following sections provide an overview of the relevant environmental legislation and guideline documents applicable to the proposed project.

3.2 OTHER RELEVANT ENVIRONMENTAL LEGISLATION

Aside from NEMA, other key environmental legislation, policies, plans and guidelines will also be triggered by the proposed project, whilst others shall provide strategic goals and priorities for different resources and sectors.

The environmental legislation relevant to the proposed project and which has been taken into account in the preparation of the Final Scoping Report is summarised below:

3.2.1 National

3.2.1.1 National Environmental Management Act (Act 107 of 1998) (NEMA)

NEMA is the principle/framework legislation governing EIA and subsequent EA processes under the authority of the National Department of Environmental Affairs.

NEMA makes provisions for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment; institutions that will promote co-operative governance;

procedures for co-ordinating environmental functions exercised by Organs of State and to provide for matters connected therewith.

Section 2 of the Act establishes a set of principles, which apply to the activities of all Organs of State that may significantly affect the environment. These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;
- Waste must be avoided or minimised, reused or recycled;
- Negative impacts must be minimised and positive impacts enhanced; and
- Responsibility for the environmental health and safety consequences of a policy, project, product or service exists throughout its entire life cycle.

These principles are taken into consideration when a Governmental Department needs to exercise its powers for example, during the processes of granting permits or Environmental Authorisations or the enforcement of existing legislation or conditions of approval.

Section 23 of NEMA furthermore provides for general objectives of Integrated Environmental Management. In alignment with these objectives, the potential impacts on the biophysical and socio-economic environments are identified and evaluated. These potential environmental impacts have been assessed during the Scoping Report phase and mitigation measures are provided where relevant.

The subsequent Environmental Impact Assessment Regulations, 2017 (Government Notices R327, R325 and R324 of April 2017, which are also referred to as Listing Notices 1, 2 and 3 respectively, list development activities which will trigger the necessity to conduct either a Basic Assessment or a full Scoping & EIA process prior to EA being obtained for a proposed project. Listing notices 1 & 3 activities require only a Basic Assessment to be conducted while Listing notice 2 activities trigger the requirement for a full Scoping & EIA process to be conducted.

Considering the nature and scale of the development activities triggered by the proposed project, it was required that a full Scoping & EIA process be conducted to provide sufficient information to the competent authority in order for them to make an informed decision regarding the approval or rejection of the EA applied for.

Only once the EA is granted and the required supporting permits have been issued, may the applicant lawfully commence with the proposed project. The Scoping & EIA process is therefore a critical component in the feasibility and planning stage of any proposed project.

3.2.1.2 National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA)

NEMBA aims to provide for the management and conservation of the country's rich biodiversity within the framework of NEMA. It aids in the protection of species and ecosystems which warrant national protection and provides for the sustainable usage of the country's indigenous biological resources.

NEMBA and its Regulations was therefore utilised for determining the ecological/biodiversity significance, value and subsequently the adequate management of the proposed project area with regards to ecosystems, habitats and individual species.

The Department of Environmental Affairs is responsible for the implementation and overseeing of this legislation along with the South African National Biodiversity Institute (SANBI).

3.2.1.3 National Forests Act (Act 84 of 1998) (NFA)

The aim of the NFA is to promote the sustainable usage, management and development of forests for the benefit of all in South Africa. The Act also makes special provisions for the protection of specific forests and tree species which duly require formal protection in order to ensure their prolonged existence.

The National Forests Act was therefore utilised to determine the potential presence of any protected forests or tree species in the proposed project area in order to ensure that the correct processes are followed for the approval of any listed activities for which a permit may be necessary regarding such forests or species, should it be required.

Permit applications in terms of the National Forests Act are lodged with the Department of Agriculture, Forestry and Fisheries.

3.2.1.4 Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA)

CARA aims to provide for the protection and control over utilisation of the country's agricultural resources in order to promote conservation of soils, water and natural vegetation as well as the combatting of weeds and invader plants. Sustainable utilisation is a key objective.

CARA was therefore used for determining the agricultural significance, value and subsequently the adequate management of the proposed project area.

It is overseen by The Department of Agriculture, Land Reform and Rural Development in the Northern Cape Province.

3.2.1.5 National Water Act (Act 36 of 1998) (NWA)

The NWA aims to ensure sustainable use of water through the protection of the quality of water resources for the benefit of all water users. Its principal focus is the rectification and equitable allocation and use of the scarce and disproportionately distributed water resources of South Africa.

The property of the proposed project has standing water rights which allows the owner to extract from the Riet River. Section 21 of NWA defines the types of water uses which require a Water Use License to be applied for. The Act stipulates that a Water Use License Application must be submitted if a development takes place within 500 m of a natural watercourse.

The Department of Water and Sanitation is responsible for the implementation and overseeing of this legislation and is also the responsible authority for the issuing of permits for water use.

3.2.1.6 National Heritage Resources Act (Act 25 of 1999) (NHRA)

The NHRA aims to provide for the integrated and interactive management and conservation of the national heritage resources in South Africa so that they may be bequeathed for future generations.

Section 38 lists categorised development processes which require the South African Heritage Resources Agency (SAHRA) to be notified and furnished with an archaeological and palaeontological study of a proposed project area in order to obtain project authorisation. The following development processes are triggered during the construction and operational phases of the proposed project:

(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as -
(c) any development or other activity which will change the character of a site -

(i) exceeding 5 000m2 in extent; or

The South African Heritage Resources Agency (SAHRA) has a mandate, in terms of the NHRA, to enforce the conditions of the NHRA, and hence oversees the management of heritage resources together with provincial heritage agencies.

3.2.1.7 National Development Plan – 2030 (NDP)

The executive summary of the National Development Plan (NDP) initiates with the following paragraph, *"The National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society."*

Chapter 6 of the NDP specifically discusses the role and importance of commercial agriculture in the success of the country's economy and reaching the objectives of the NDP. It discusses the potential associated with the expansion of irrigated land towards food security and also job creation and capacity building (skills development and experience).

The development of the proposed potato pivots therefore be beneficial in terms of the goals/objectives described with regards to agriculture in the NDP.

3.2.2 Provincial

3.2.2.1 Northern Cape Nature Conservation Act (Act 9 of 2009)

In addition to the NFA, the Northern Cape Nature Conservation Act also makes provision for the protection and sustainable utilisation of wild animals, aquatic biota and plants on a provincial scale in the Northern Cape Province. It is therefore used in conjunction with the NFA to determine the ecological/biodiversity significance, value and subsequent management of the proposed project area.

The Northern Cape Nature Conservation Act was utilised to determine the potential presence of any provincially protected or specially protected species in the proposed project area in order to ensure that the correct processes are followed for the approval of any listed activities for which a permit may be necessary regarding such species, should it be required.

Permit applications in terms of the Northern Cape Nature Conservation Act (Act 9 of 2009) are lodged with the relevant provincial authority, which in this case is the Department of Environment and Nature Conservation in the Northern Cape Province.

3.2.2.2 Northern Cape Provincial Spatial Development Framework

The Northern Cape Provincial Spatial Development Framework (NCPSDF) was formulated in 2011 to meet the requirements of the Northern Cape Planning and Development Act, 1998 (Act 7 of 1998) and the Municipal Systems Act, 2000 (Act 32 of 2000). Prepared in accordance with a bioregional planning approach adapted to suit the site-specific requirements of the Northern Cape, the NCPSDF recognises that no region or area should be planned and managed as an 'island' in isolation from its surroundings. Together, unit areas form part of the broader environment and the mutual relationships and linkages between adjacent units must be understood and applied.

The framework aims to act as a policy and strategy providing direction and guidance for:

- future land use,

- spatial context for provincial sectoral strategies,
- promoting a developmental state,
- alignment of environmental management priorities, and
- mobilising the overarching objective of the Northern Cape Provincial Growth and Development Strategy (PGDS) to build prosperous, sustainable and growing provincial economy to eradicate poverty and improves social development.

A focus for achieving sustainable development as discussed in the framework, requires four areas of capital, being environmental, human, infrastructure and monetary. The plan further stresses the need for integrative participation, positive interventions and innovative finance. The SDF makes specific reference to the importance of agriculture and capacity increase in this sector in the Northern Cape Province.

The proposed project will make a positive contribution towards various objectives of the SDF.

3.2.2.3 Northern Cape Provincial Growth and Development Strategy (NCPGDS)

The Northern Cape Provincial Growth and Development Strategy (NCPGDS) (2004 – 2014) highlights the most significant growth and development challenge as the reduction of poverty, and that only through long-term sustainable economic growth and development shall this be achieved. Important areas where growth can be achieved include agriculture and agro-processing, transport and tourism. In support of such growth areas the creation of opportunities for life-long learning, improvement of labour force skills to enhance productivity and expanding access to education and knowledge shall lead to the further realisation of such growth. Specialist

The inclusion of macro-level objectives shall mobilize these primary growth areas. Such objectives include the developing of human and social capital, improving the efficiency and effectiveness of governance and associated institutions and enhancing infrastructure for economic growth and development.

3.2.3 District and Local

3.2.3.1 Pixley Ka Seme District Municipality Integrated Development Plan 2017-2022

The District Municipality has developed its vision, development priorities, objectives and strategies with specific outcomes and outputs for the 2017-2022 financial year.

Vision

"Developed and Sustainable District for Future Generations.".

Mission

The Pixley Ka Seme District Municipality will achieve its vision by:

- Supporting our local municipalities to create a home for all in our towns; settlements and rural areas to render dedicated services;
- Providing political and administrative leadership and direction in the development planning process;
- Promoting economic growth that is shared across and within communities;
- Promoting and enhancing integrated development planning in the operations of our municipalities; and
- Aligning development initiatives in the district to the National Development Plan.

The proposed project will be able to contribute positively to these objectives through job creation and sustainable capacity building (skills development and experience).

3.2.3.2 Siyancuma local municipality Integrated Development Plan 2015/2016

The following vision and mission is engrained into the Integrated Development Plan (IDP) of the Siyancuma local municipality

Vision

We Siyancuma Municipality commit ourselves to be a sustainable, economically viable, developmental municipality where the community enjoys a high quality of life.

Mission

We will Strive to put the needs of the community first by:

- To economically and socially develop the municipal area;
- Empower the community through transparent, accountable democratic governance and sound financial management
- By utilizing all available resources and human skills.

The proposed project will be able to contribute positively to these objectives through job creation and sustainable capacity building (skills development and experience).

3.3 RELEVANT GUIDELINES

The table (table 3) below lists the Guideline Documents that are applicable to the proposed project, and which are considered as part of the EIA process, as are required in terms of the NEMA EIA Regulations; 2017.

Table 3: Applicable guideline documents

1	**DETEA EIA Guideline and Information Document Series**
1.1	*Draft Guideline on the **Need and Desirability** in terms of the EIA Regulations of 2010*. Integrated Environmental Management Guideline Series 9, Government Notice 792 of 2012.
2	**DEA & DP EIA Guideline and Information Document Series**
2.1	*Guideline on **Generic Terms of Reference for EAPs and Project Schedules***, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning, March 2013.
2.2	*Guideline on **Need and Desirability**, EIA Guideline and Information Document Series*. Western Cape Department of Environmental Affairs & Development Planning, March 2013.
2.3	*Guideline on **Alternatives**, EIA Guideline and Information Document Series.* Western Cape Department of Environmental Affairs & Development Planning, March 2013.
2.4	*Guideline on **Public Participation**, EIA Guideline and Information Document Series*. Western Cape Department of Environmental Affairs & Development Planning, March 2013.
3	**DEA&DP Guideline Document Series for Involving Specialists in the EIA Process, and others**
3.1	*Guideline for **Environmental Management Plans***. CSIR Report No ENV-S-C2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town (Lochner, P. 2005).

3.4 NEMA LISTED ACTIVITIES TRIGGERED BY THE PROPOSED PROJECT

The development activities in the National Environmental Management Act (Act 107 of 1998): Environmental Impact Assessment Regulations, 2017 (Government Notices R327, R325 and R324) which are triggered by the proposed project are listed in the table (table 4) below:

Table 4: Environmental Impact Assessment Regulations, 2017 listed activities triggered by the proposed project

Regulation	Activity	Description of trigger activity in proposed project
GN. R. 327 Listing Notice 1	**Activity 12** The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres or more where such development occurs – (b) within a watercourse;	Approximately 17.5 km pipelines with a diameter ranging between 250 mm – 315 mm will be constructed to transport water from the extraction point in the Riet River. Sections of this pipeline (covering more than 100 square metres) will be

Regulation	Activity	Description of trigger activity in proposed project
	(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse	constructed through and within 32 metres of existing watercourses.
GN. R. 327 Listing Notice 1	**Activity 19** The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse	The additional pumping and piping infrastructure required to be installed for the proposed project at the water extraction point in the Riet River could potentially trigger this activity.
GN. R. 325 Listing Notice 2	**Activity 13** The physical alteration of virgin soil to agriculture, or afforestation for the purposes of commercial tree, timber or wood production of 100 hectares or more.	Cultivation and establishment of 17 seed potato pivots of approximately 765 ha of natural vegetation. The total size of the farm portion to be impacted by roads and associated infrastructure of the proposed project is approximately 765 ha.
GN. R. 325 Listing Notice 2	**Activity 15** The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	Cultivation and establishment of 17 seed potato pivots of approximately 765 ha of natural vegetation. The total size of the farm portion to be impacted by roads and associated infrastructure of the proposed project is approximately765 ha.
GN. R. 324 Listing Notice 3	**Activity 4** The development of a road wider than 4 metres with a reserve less than 13,5 metres. (G) In the Northern Cape provinces: (ii) Outside urban areas, in: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans	A portion of the site falls inside a Critical Biodiversity Area and associated gravel access roads wider than 4 m will be established in and around the proposed pivots.
GN. R. 324 Listing Notice 3	**Activity 12** The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for	The site falls inside a Critical Biodiversity Area and cultivation and establishment of 17 seed potato pivots of

Regulation	Activity	Description of trigger activity in proposed project
	maintenance purposes undertaken in accordance with the maintenance management plan. (G) In Northern Cape: (ii) Within critical biodiversity areas identified in bioregional plans	approximately 765 ha of natural vegetation. The total size of the farm portion to be impacted by roads and associated infrastructure of the proposed project is approximately 765 ha.
GN. R. 324 Listing Notice 3	**Activity 14** The development of – (ii) infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs— (A) Within a watercourse- (H) In Northern Cape (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional Plans	The additional pumping and piping infrastructure required to be installed for the proposed project at the water extraction point in the Riet River could exceed 10 m² in size.

3.5 NEMA REGULATION 23 IMPACT ASSESSMENT REPORT INFORMATION COMPLIANCE

Regulation 23(3) of the Environmental Impact Assessment Regulations, 2017 (R326) refers to Appendix 3 which provides the content requirements for an Impact Assessment Report.

The table below (table 5) lists the relevant requirements for the Impact Assessment Report as per Appendix 3 of the Regulations as well as providing cross-references to where the relevant information is located in this document and/or its appendices.

Table 5: Information required in the Impact Assessment Report as per Appendix 3 of GN R. 326 of the EIA Regulations, 2017

EIA Regulations 2017 - Appendix 3 – Scope of assessment and content of environmental impact assessment reports	Location in this document
(a) details of-	
(i) the EAP who prepared the report; and	Section 2.1
(ii) the expertise of the EAP, including a curriculum vitae;	Section 2.2

(b) the location of the activity, including-	Section 4.1
(i) the 21 digit Surveyor General code of each cadastral land parcel;	Section 4.1
(ii) where available, the physical address and farm name;	Section 4.1
(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 4.1
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-	Section 4.1
(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	N/A
(d) a description of the scope of the proposed activity, including-	
(i) all listed and specified activities triggered and being applied for; and	Section 3.4
(ii) a description of the associated structures and infrastructure related to the development;	Section 4.2
(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Section 3
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 5
(h) a full description of the process followed to reach the proposed development footprint within the approved site, including:	Section 4.1
(i) details of the development footprint alternatives considered;	Section 6
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 8
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 8
(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
(v) the impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 9
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	Section 9.1
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 9.2

(viii) the possible mitigation measures that could be applied and level of residual risk;	Section 9.2
(ix) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	N/A
(x) a concluding statement indicating the preferred alternative development location within the approved site;	Section 9.6
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity the associated structures and infrastructure will impose on the preferred location through the life of the activity including:	Section 9
(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and;	Section 9.2
(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 9.4
(j) an assessment of each identified potentially significant impact and risk, including;	Section 9.4
i) cumulative impacts	Section 9.4
ii) the nature, significance and consequences of the impact and risk;	Section 9.
iii) the extent and duration of the impact and risk	Section 9.
iv) the probability of the impact and risk occurring	Section 9.4
v) the degree to which the impact and risk can be reversed	Section 9.4
vi) the degree to which the impact and risk may cause irreplaceable loss of resources and;	Section 9.4
vii) the degree to which the impact and risk can be mitigated	Section 9.4
(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 of these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report	Section 7
(l) an environmental impact statement which contains-	Section 11.2
i) a summary of the key findings of the environmental impact assessment:	Section 11.2
ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and;	Section 7 Appendix B
iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 9.3
(m) based on the assessment and where applicable, recommendations from specialist reports, the recording of proposed management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation	Section 7
(n) the final proposed alternatives which respond to the impact management measures, avoidance and mitigation measures identified through the assessment	Section 9.4 Section 11.1
(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are not to be included as conditions of authorisation	N/A

(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 10
(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of the authorisation	Section 11
(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised	N/A
(s) an undertaking under oath or affirmation by the EAP in relation to-	Appendix D
(i) the correctness of the information provided in the report;	
(ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and	Appendix C
iii) the inclusion of inputs and recommendations from the specialist reports where relevant	Appendix E
(iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Appendix C
(t) where applicable, details of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts	N/A
(u) an indication of any deviation from the approved scoping report, including the plan of study including-	N/A
i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks and	N/A
ii) a motivation for the deviation	N/A
(v) any specific information that may be required by the competent authority and	N/A
(w) any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

4. PROJECT LOCATION AND DESCRIPTION

The following section provides an overview of the proposed project location as well as a detailed description of the proposed project.

4.1 PROJECT LOCATION

The proposed project area is approximately 765 ha in surface size and is situated on the Remaining extent of Farm Zulani 167 (SG 21 Digit Code: C03700000000016700000) extending approximately 1850 ha. The proposed water pipeline will also be located on the above property and will no traverse any other portions or farms. The farm is located approximately 42km outside the town of Douglas towards Kimberley. The property is in the name of Larandre Game Ranch (Pty) Ltd. whereby Mr. Frank Lawrence is the 100% shareholder. As a result, no consent is required as Idstone Farming is also 100% owned by Mr. Frank Lawrence.

The property falls inside Siyancuma local Municipality which, in turn, forms part of the greater Pixley Ka Seme District Municipality. Access to the proposed project area is obtained by way of the R 357 provincial road as the farm is situated directly to the South of the R 375 provincial road.

See locality map below.

Table 6: Farm name and Number with SG code and Landowner name

Farm Name and Number	SG 21 Digit Code	Land owner
Remaining extent of Farm Zulani 167	C03700000000016700000	Larandre Game Ranch (Pty) Ltd.

(See Appendix F for the title deeds)

Title deed number for the Remaining extent of Farm Zulani 167: 2649-2016

The four corner coordinate points for the corners of the proposed property area are as follows:

- North-western corner 28°57'22.35"S; 24° 7'49.41"E
- North-eastern corner 28°57'58.32"S; 24° 4'29.08"E
- South-eastern corner 29° 0'42.48"S; 24° 4'26.92"E
- South-western corner 28°59'59.72"S; 24° 7'15.68"E

The centre points of all the ***Alternative 1 (Preferred Alternative)*** pivots are as follows

45 hectare Pivots:

- Pivot 1 - 28°57'48.13"S; 24° 6'40.14"E
- Pivot 2 - 28°58'14.01"S; 24° 6'35.37"E
- Pivot 3 - 28°58'39.55"S; 24° 6'29.05"E
- Pivot 4 - 28°59'4.74"S; 24° 6'25.89"E
- Pivot 5 - 28°57'55.09"S; 24° 6'9.11"E
- Pivot 6 - 28°58'19.79"S; 24° 6'5.20"E
- Pivot 7 - 28°58'45.07"S; 24° 6'0.00"E
- Pivot 8 - 28°57'59.50"S; 24° 5'39.70"E
- Pivot 9 - 28°58'25.33"S; 24° 5'36.92"E
- Pivot 10 - 28°58'51.25"S; 24° 5'27.90"E
- Pivot 11 - 28°58'5.29"S; 24° 5'10.60"E
- Pivot 12 - 28°58'30.86"S; 24° 5'8.97"E
- Pivot 13 - 28°58'53.77"S; 24° 4'45.98"E
- Pivot 14 - 28°59'20.44"S; 24° 4'42.70"E
- Pivot 15 - 28°59'46.59"S; 24° 4'43.58"E
- Pivot 16 - 29° 0'12.63"S; 24° 4'43.49"E
- Pivot 17 - 28°59'59.71"S; 24° 5'9.45"E

The centre points of all the ***Alternative 2*** pivots are as follows:

45 hectare Pivots:

- Pivot 1 - 28°57'48.13"S; 24° 6'40.14"E
- Pivot 2 - 28°58'14.01"S; 24° 6'35.37"E
- Pivot 3 - 28°58'39.55"S; 24° 6'29.05"E
- Pivot 4 - 28°59'4.74"S; 24° 6'25.89"E
- Pivot 5 - 28°57'55.09"S; 24° 6'9.11"E
- Pivot 6 - 28°58'19.79"S; 24° 6'5.20"E
- Pivot 7 - 28°58'45.07"S; 24° 6'0.00"E
- Pivot 8 - 28°57'59.50"S; 24° 5'39.70"E
- Pivot 9 - 28°58'25.33"S; 24° 5'36.92"E
- Pivot 10 - 28°58'51.25"S; 24° 5'27.90"E
- Pivot 11 - 28°58'5.29"S; 24° 5'10.60"E
- Pivot 12 - 28°58'30.86"S; 24° 5'8.97"E
- Pivot 13 - 28°58'53.77"S; 24° 4'45.98"E
- Pivot 14 - 28°59'21.69"S; 24° 4'43.69"E

The start, deviation and split points of the proposed **water pipeline route** are as follows:

- Start point - 29° 0'15.10"S; 24° 6'36.97"E
- Deviation point 1 - 28°59'44.16"S; 24° 6'36.35"E
- Deviation point 2 - 28°58'45.81"S; 24° 5'59.91"E

- Deviation point 3 - 28°59'4.38"S; 24° 5'29.83"E
- Deviation point 4 - 28°59'7.43"S; 24° 4'46.93"E
- Deviation point 5 - 28°59'20.38"S; 24° 4'42.59"E
- Split Point 1 - 28°58'58.54"S; 24° 5'59.54"E
- Split Point 2 - 28°58'22.43"S; 24° 5'50.98"E
- Split Point 3 - 28°58'0.26"S; 24° 5'39.92"E
- Split Point 4 - 28°59'47.42"S; 24° 4'42.66"E

Table 7: Details of relevant land owner

Company/entity name:	Larandre Game Ranch (Pty) Ltd.
Postal address:	PO Box 110535, Hadison Park, 8306
Contact person:	Frank Lawrence
Designation:	Owner
Contact number:	082 568 4615
E-mail address:	lawrancefrank@gmail.com

A visual illustration of the proposed project area is provided in Figures 1 & 2 while the location of the proposed project area in relation to the nearby town, access roads and adjacent farms is illustrated on the locality map in Figure 3 below:

Figure 1: Image visually illustrating the general vegetation cover

Figure 2: Image visually illustrating the general vegetation cover

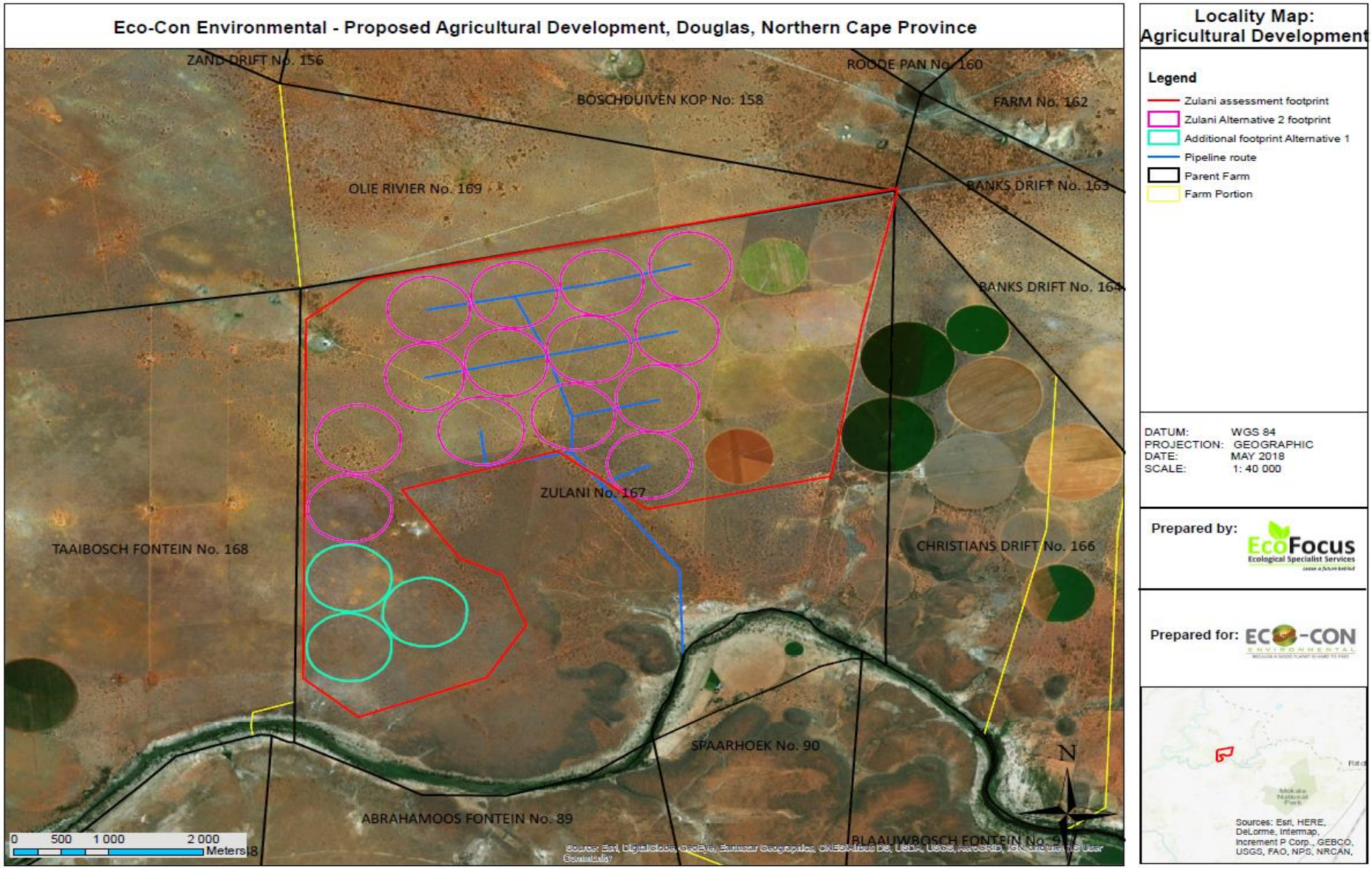


Figure 3: Locality map of the proposed project layout (see Appendix B for an A3 size version)

4.2 PROJECT DESCRIPTION

The company Idstone Farming (Pty) Ltd. is proposing to commence with the process of procuring the Farm Zulani No. 167 near the town of Douglas in the Northern Cape Province (765 ha). The reason for the intended procurement is for establishing Seventeen (17) 45 ha seed potato farming pivots on the farm of natural previously uncultivated land.

It has to be noted that the seed potato pivot preparation and planting/development phase will take approximately 8 years to be complete and will continue to follow an 8-year rotation cycle. In other words, not all pivots will be planted simultaneously. After each season, each pivot will be rehabilitated using buffalo grass and will remain dormant/inactive for a period of 7 years, before planting will again commence on the pivot. This cycle will continue.

In order to achieve the above, the following are proposed:

Site / Property Alternatives

The applicant owns a number of farms within a surrounding 45 km region of the proposed development areas. The overwhelming majority of the undeveloped farms owned by the applicant either fall within a Critical Biodiversity Area one (CBA 1) or Critical Biodiversity Area two (CBA 2) in accordance with the NCSBP. A minor portion of the farms to the north owned by the applicant falls within Ecological Support Areas (ESA) or Other Natural Areas (ONA) in accordance with this Plan.

The majority of the undeveloped farms owned by the applicant either fall within the Kimberley Thornveld (SVk 4) or Vaalbos Rocky Shrubland (SVk 5) vegetation types. The Kimberley Thornveld vegetation type (SVk 4) is mainly associated with the nesting habitat and foraging grounds of the critically endangered Red Data Listed bird species Gyps africanus (African white-backed vulture) as well as suitable habitat and soil conditions for the presence of the nationally protected tree species Vachellia erioloba (Camel thorn) & Vachellia haematoxylon (Grey camel thorn). Only small isolated portions of a number of farms owned by the applicant, which are traversed by significant watercourses, fall within the Upper Gariep Alluvial vegetation type (Aza 4). These portions however all either fall within a Critical Biodiversity Area two (CBA 2) or Critical Biodiversity Area one (CBA 1).

From an alternative site / property location point of view for the proposed developments, it is therefore evident that the applicant has limited options for developing on other sites/farms which would avoid or limit ecological impacts on CBAs or protected/Red Data Listed species.

Therefore, given the significance of residual impacts and scope for mitigation, it is recommended that Alternative 2 for the Remaining Extent of the Farm Zulani no 167 be considered for development due to those

alternatives mostly falling outside the CBA 2 and constituting relatively smaller development footprints. Pursuing these options would ensure that the direct footprint impact on the ecologically sensitive CBA 2 is avoided as far as practicably possible. It would also ensure that a proportion of the direct footprint impact on the nesting habitat and foraging grounds of critically endangered birds and on nationally protected trees could be avoided.

Layout Alternatives

During the scoping phase of the project three layout alternatives have been evaluated, however, due to valuable progress made on one of the applicant other projects, the layouts for the proposed development have changed to only two layout alternatives which differ slightly from the ones evaluated in the scoping phase. It has to be noted that although the layouts have changed slightly, the area in which the development will take place, remains exactly the same. In other words, some minor internal layouts have changed as per description below.

Layout Alternative 1 (Preferred Layout Alternative)

The Preferred Layout alternative (Alternative 1) includes the development of seventeen (17) 45 ha seed potato pivots. Twelve (12) of the proposed 45ha pivots are located to the Northern part of the remaining Extent of the Farm Zulani 167 which is located outside the Critical Biodiversity Area 2, while five (5) of the proposed 45ha pivots are located to the centre-left and south of the development area which is located in a Critical Biodiversity Area 2.

Figure 4: Zulani Preferred Alternative (Alternative 1)

Layout Alternative 2

Layout Alternative 2 includes the development of fourteen (14) 45 ha seed potato pivots. Twelve (12) of the proposed 45ha pivots are located to the Northern part of the remaining Extent of the Farm Zulani 167 which is located outside the Critical Biodiversity Area 2, while two (2) of the proposed 45ha pivots are located to the centre-left of the development area which is located in a Critical Biodiversity Area 2.

Figure 5: Zulani Alternative 2

Seed potato farming is very labour intensive and numerous job opportunities will be created. Furthermore, seed potato farming has one of the highest value per cubic metre water (R50/m^3) in comparison with wheat which is R5/m^3).

Already established two track farm roads are already in place and will link up most of the pivots. In some cases, where tracks do not exist, some new two track farm road might be established.

A new water extraction point with pumping system and pipeline will be constructed and put in place to extract water from the Riet River on the Remainder of the Farm **Zulani No.** 167. This will be used for the irrigation of all seed potato pivots as described in this report.

The project will entail two major aspects namely:

- The construction of a pipeline and water extraction point in the Riet River.
- Cultivation of seed potato pivots and some two track access roads.

4.2.1 Construction of a pipeline and water extraction point in the Riet River.

A new water extraction point with pumping system will be constructed and put in place to extract water from the Riet River on the Remainder of the Farm Zulani No. 167. This will be used for the irrigation of all seed potato pivots as described in this report.

Extraction Pump:

- The extraction pumps are 2x 75kW pumps and will be constructed outside the 1:100 meter flood line of the Riet River. The pumping station will cover an area of approximately 10m2. From here, the extraction pipe will be installed on a float (1x2m) which will be able to rise and descend with the water level. This will not significantly impact on any important riparian vegetation species as this area is mostly disturbed already
- The power for the extraction pump will be obtained from a new Eskom power point.
- The extraction pump will run for approximately 12 hours per day, during planting season which is 4-5 months, pumping water to the amount of 300 m3 per hour (Monday to Friday).

Pipelines:

- A 315 mm pipeline of approximately 1,4 km in length will be constructed to transport water from the extraction point in the Riet River to the booster pumps (75Kw) and from there with 250 mm and 315

mm pipelines directly into the pivots. A narrow section of approximately 900 mm will be cleared in order to accommodate the piping infrastructure. This will not significantly impact on any important riparian vegetation species as this area is mostly disturbed already. However, some tree species such as the *Vachellia erioloba* (nationally protected) and *Vachellia haematoxylon* (nationally protected) might also need to be removed in order to make way for the proposed pipeline. The pipeline will be buried subsurface to prevent any potential damage or obstruction. A trench of approximately 900 mm wide will be excavated in order to accommodate the subsurface burial of the pipeline.

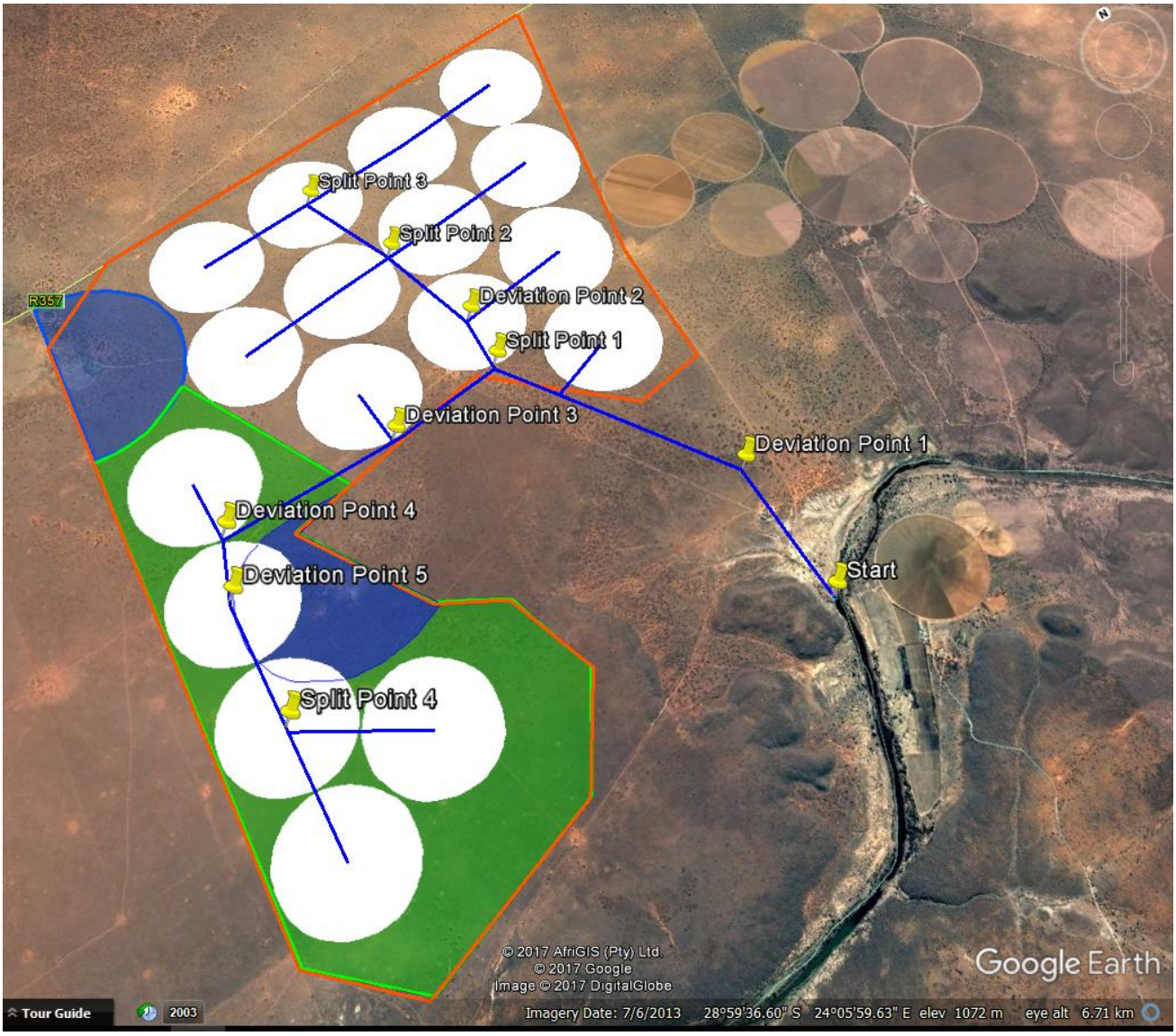


Figure 6: Pipeline route (Location to be finalised during Impact Assessment phase

4.2.2 Cultivation of Seed potato pivots.

765 ha (Seventeen (17) 45 ha pivot circles) will be established on the proposed project footprint with only 2 x 45 ha pivots being cultivated per season. The other circles are establishing to dryland pasture and left fallow for 7 years.

The cultivation and planting process will work as follows:

- The area will be cleared with the use of a Bulldozer and deep-ripped with the dozer tines to breakup and aerate the soils.
- Surface rocks will be manually removed from the area.
- Soil preparation will then be conducted by cultivation with the use of a chisel plough.
- Amelioration recommendations will be obtained from a soil scientist through chemical and organic soil analyses in order to ensure the appropriate nutrients/minerals, as required for the pivots, are incorporated into the growth medium (soil) prior to planting.
- A pivot irrigation system will be constructed and implemented over the entire proposed pivot area.
- Irrigation water will be abstracted from the Riet River as per the allotted water rights registration for the consolidated farm portions.
    - See Appendix G for the water use rights documentation indicating the allowable water use.
    - 11 000 m^3/ha/annum over a total 69.2 ha is allotted in terms of the water use rights documentation. As a result, additional Water use rights and authorisation will have to be obtained prior to the establishment of the Pivots.
- Planting of seed potatoes will be conducted manually through manual labour.

4.2.3 Project Description Summary

The development of Alternative 1 (Preferred Alternative) will constitute a total footprint area of approximately 765 ha as indicated on the locality map. This will include the seed potato pivots along with certain internal two track gravel roads and associated infrastructure such as the pipeline and extraction pump

It has to be noted that the seed potato pivot preparation and planting/development phase will take approximately 8 years to be complete and will continue to follow an 8-year rotation cycle. In other words, not all pivots will be planted simultaneously. After each season, each pivot will be rehabilitated using buffalo grass and will remain dormant/inactive for a period of 7 years, before planting will again commence on the pivot. This cycle will continue.

If the operational phase is ever concluded in the future, the area will be suitable rehabilitated in order to return the project area to a self-sustainable ecological state.

4.3 PROJECT SERVICES

4.3.1 Electricity Supply

- The water extraction pump required during the operational phase at the Riet River extraction point is the only aspect requiring electricity. The electricity will be obtained from a new Eskom power point.

4.3.2 Sewage Management

- Sufficient portable chemical toilets will be supplied on site for the manual labourers during the construction phase. These toilets will be cleaned and waste removed by an appropriate contractor on a regular basis as and when required.
- Sufficient portable chemical toilets will also be supplied on site for the manual labourers during the short annual harvesting periods. These toilets will be cleaned and waste removed by an appropriate contractor on a regular basis as and when required.

4.3.3 Solid Waste Management

- Solid general waste generated on site will be removed by the applicant to the local municipal landfill site on a regular basis as and when required.
- It is envisaged that no significant hazardous waste will be generated on site during the construction or operational phases of the project. If any significant hazardous waste is however generated and suitable, registered waste contactor will be contracted to adequately remove and dispose of it.

4.3.4 Water Supply

As discussed under section 4.2.1 above, water will be extracted from the Riet River for irrigation purposes. See Appendix G for the water use rights documentation indicating the allowable water use. Additional Water use rights and authorisations will have to be obtained prior to the establishment of the Pivots.

5. NEEDS AND DESIRABILITY OF THE PROJECT

Various key factors must be taken into consideration as motivation/incentive for the potential benefits involved with the proposed project. These factors have been summarised below:

Seed potato production is one of the most valuable agricultural crops that can be grown in the Northern Cape. As long ago as 1948 Dr van der Plank, the world-renowned potato scientist and breeder, identified the area between Modder River and Douglas as one of the ideal seed production areas in South Africa. Since then the industry has established itself in the area with large investments in green houses, packing facilities and cold storage facilities. In terms of value per cubic meter of water, job creation, export earnings and sustainability it is one of the top three crops in the Northern Cape, including table grapes and pecan nuts. The one essential requirement for successful seed potato production is the space to implement a sustainable long term rotational system. Ideally this should be an eight-year rotation with the fallow fields being established to natural grasses occurring in the area. This is done by planting the grasses after the potatoes and irrigating the field until the grass is established. Thereafter it is rain fed. These fallow circles are then used for livestock production for the rest years. More detail is provided below.

5.1 COMPETITIVE ADVANTAGE:

There are only a few crops that have a strong competitive advantage in the irrigation areas around Kimberley. Seed potatoes is one of them.

The factors contributing to this competitive advantage are the following:

1. A low viral disease environment. The most important vector for viral diseases is plant aphids. The relative isolation, limited production of potatoes and other related species (e.g. tomatoes), the dry climate and the cold winters make the Northern Cape an ideal area.
2. A reliable supply of irrigation water.
3. Space to follow an eight-year rotational system with fallow lands only being used for grazing of livestock. This rotational system inhibits the buildup of bacterial and other diseases and also undesirable eelworm species. The seven years of animal grazing also helps restore some of the organic matter in the soil. This rotational system ensures long term sustainability in terms of viable potato seed production.
4. Suitable soils. The designated soils are particularly suited for potato production. These types of soil are not readily available close to reliable irrigation water resources.

The combination of the above factors makes this an excellent seed production area with definite advantages compared to other seed production areas in South Africa.

5.2 VALUE OF CROP:

South Africa is a water stressed country and it is therefore essential that we use our irrigation water effectively. Based on water use (m3 of water used per ton of food produced) potatoes are one of the most efficient. An example of the findings of a study in the USA is included in figure 7 below.

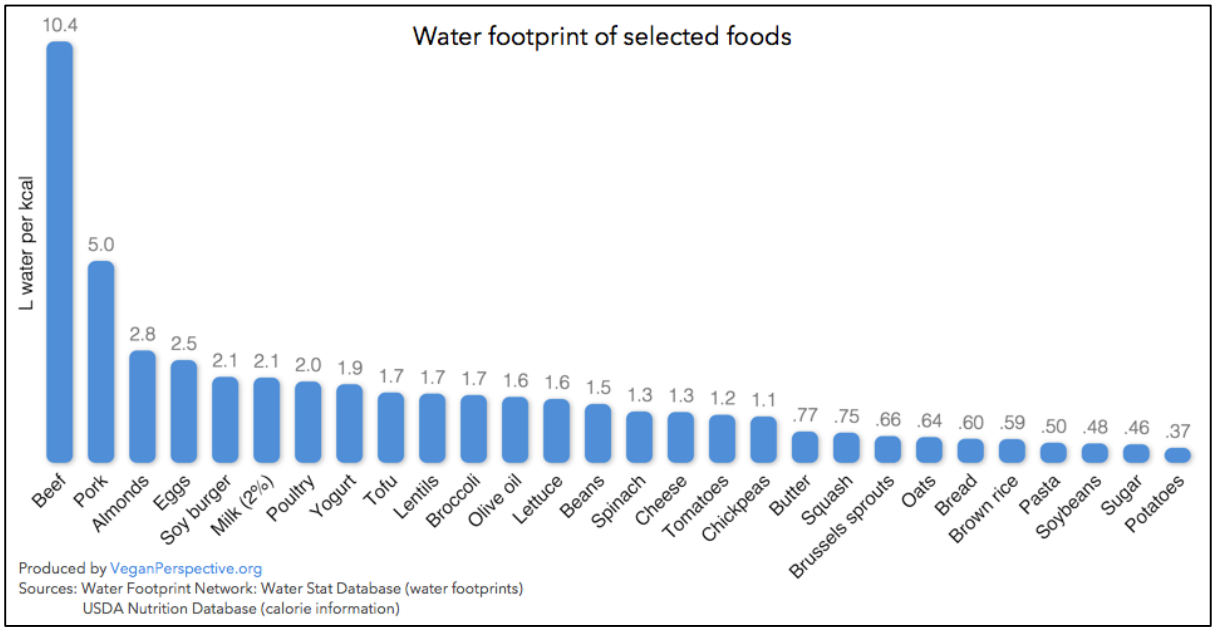


Figure 7: Water footprint of selected foods: USDA

The comparison of crops grown in the irrigation areas around Kimberley further support these findings. See Table 8.

Table 8: Crop yield in kg produce per cubic meter water used

Crop	Water requirements m3 per ha	Yield tons/ha	Yield in kg product per m3 water used
Seed Potatoes	5570	70	12.6
Onions	5300	65	12.3
Pecan Nuts	11000	2.5	0.2
Cotton	7534	5.5	0.7
Groundnuts	6900	4	0.6
Lucerne	11000	20	1.8
Maize	6900	15	2.2
Wheat	5700	8	1.4

These water use figures are from the Oranje Riet Water User's Association and are based on long term usage.

It can be seen that with potatoes 12.6 kg produce is produced with 1 m3 of water compared to 1.4kg in the case of wheat. The yield per ha for potatoes also has the potential to be relatively higher than the yields of the other crops with yields of over 100 tons per ha having been recorded in this area. That would tale the yield per cubic meter up to 18 kg.

Table 9: Value of crops grown under irrigation

Crop	Water requirements m3 per ha	Yield tons/ha	Price of Product Rand/ton *	Gross Income per ha	Income per m3 of water
Seed Potatoes	5570	70	4370	305900	54.92
Onions	5300	65	3200	208000	39.25
Pecan Nuts	11000	2.5	80000	200000	18.18
Cotton	7534	5.5	9200	50600	6.72
Groundnuts	6900	4	12000	48000	6.96
Lucerne	11000	20	2100	42000	3.82
Maize	6900	15	2200	33000	4.78
Wheat	5700	8	4150	33200	5.82

* Price of product = Price of product with delivery at first point of transaction before transaction costs.
**Price of potatoes is a weighted price of ware and seed in a 70:30 ratios.

As can be seen in Table 9 above, the value created by seed potato production far exceeds that of other crops grown in the Kimberley area both on an income per hectare basis and an income per cubic meter of water basis. Therefore, potato seed production should play a strategic role in the crop mix of the Northern Cape.

According to Potato South Africa, potatoes make up 8% of the staple diet of South Africans. It is affordable, nutritious and 100% locally grown. The Northern Cape area is the second biggest seed producing area for the industry and therefore plays a very strategic role. This role will probably increase with the water situation in the Western Cape where extensive ware and seed production takes place but where farmers are increasingly concentrating on their permanent fruit crops in the declining water availability situation.

5.3 JOB CREATION

Seed potato farming is capital and labour intensive. At present, it costs about R180 000 per ha to produce seed potatoes and this has a huge multiplier effect in the farming, labour and business community.

The jobs created involve skilled, semi-skilled and a labour component. Today most of the harvesting is done by mechanical harvesters so the labour component is mainly made up of labour in the packing shed and labour

used for rogueing which is the continual monitoring and removal of any off-types or diseased plants in the seed plantings. None of the work can be regarded as menial labour.

The skilled and semi-skilled staff component is made up of managers, admin staff, foremen, various machine operators and maintenance personnel. Two of the three managers are white and the rest of the staff are all Black.

At Idstone Farming the seed potato farming creates the following work opportunities:

Seasonal labour: 70 man days per ha = 250 people

Permanent staff: 33 man days per ha = 30 people

The seasonal labour works from May until the end of September. About 9 to 10 months per year. We have used the same people for the last 20 years and have built up a solid relationship over the years.

Table 10 shows the Actual Cost of employment created by potato farming for Idstone Farming last year (2015/16)

Table 10: Employee costs 2016

	Total 2016	Potatoes 2016	Potatoes per ha
Seasonal labour (May to September)	R6,994,263	R4,420,442	R10,808
Permanent employees	R5,836,566	R2,743,186	R6,707
Management	R3,111,607	R1,462,455	R3,576
Total	R15,942,436	R8,626,083	R21,091

Actual figures from 2015/2016 management reports
The above figures exclude the cost and work opportunities for developing new lands.

5.4 DEVELOPMENT OF NEW LANDS

At the end of last year Idstone sold its properties in the Bloemhof area so that it could consolidate its farming enterprises in the Kimberley - Douglas area. Three farms were bought to be able to shift the potato farming enterprise from Bloemhof to this area. All the properties are excellently suited for potato production as explained above. This unfortunately entails the breaking of new ground and the removal of indigenous trees.

It is important to note that this whole project is based on a strict rotational system where only one circle out of eight is cultivated each year. The balance of the circles (7 out of 8) are used for cattle pastures. The circles

occupy 75% of the land. The rest is left in its natural state. Also seeing that only 1 out of 8 circles are used in any one year, the actual irrigation takes place on 9.3% of the land (1/8 x75%).

It is also the EPA`s opinion that the carrying capacity of the farm is actually increased with this system probably due to the combined effect of bush removal and residual fertilizer in the soil.

Idstone farming understand the sensitivity around the removal of the natural veld and would like to cooperate with the necessary departments to make this a successful project with minimal impact on the environment, but the economic and social benefits of the project must be borne in mind. The fact is that the grazing potential of the veld is not reduced, but that an additional value through potato farming can be established on a long term sustainable basis.

This veld in its natural state can support about 100 breeding cows. This would create one job opportunity (at most) and an income of about R150 per ha. With the potato project, the income is increased to R27 000 per ha on the whole area (R30 5000 x 9%) plus the original R150 and about 200-300 job opportunities are created. **The EAP believe this deserves serious consideration.**

Idstone is willing to propose the following interventions:

1. On the properties which was purchased there is a massive problem with Prosopis trees. The one property of about 700 ha is almost completely covered with Prosopis and Idstone undertake to remove these trees. This will enhance, on some way, the vulture foraging habitat.
2. Idstone have also found “satansbos” (*Solanum eleagnifolium*) on the river banks. This has obviously been transferred from the Eastern Free State with the occasional floods of the Riet and Modder rivers. Idstone know these are highly undesirable weeds and we will eradicate them as well.
3. **Idstone have adjoining properties to all the designated areas and are willing to “set aside” these properties from any irrigation development.** This was evaluated as part of the draft ecological offset report attached to this document.
4. Idstone have cooperated with the Vulture research group over the last few years and have many active nesting sites on the farms, mostly on Wildehondepan and Langplaas. Idstone will also undertake to cooperate with the department to relocate the few vultures in the designated area and will not disturb any breeding pairs. This will be discussed with avifaunal specialist and Idstone will fully cooperate with them.

6. ALTERNATIVES CONSIDERED

According to Chapter 1 of NEMA EIA Regulations of April 2017, Notice R326, *"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 l**ocation** where it is proposed to undertake the activity;*
*(b) The **type** of activity to be undertaken;*
*(c) The **design** or **layout** of the activity;*
*(d) The **technology** to be used in the activity;*
*(e) The **operational** aspects of the activity; and*
*(f) The option of **not implementing** the activity.*

These NEMA EIA Regulations 2017, Notice R326, recognises that details on alternatives need to include *"a description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity".*

The consideration of alternatives is therefore a key component of an EIA process. While an EIA process should investigate and comparatively ***consider*** all alternatives that have been identified, only those found to be "feasible" and "reasonable" must be comparatively ***assessed***, in terms of the advantages and disadvantages that the proposed activity and alternatives will have on the environment and on the socio-economic aspects of communities that may be affected by the activity.

The "feasibility" and "reasonability" of an alternative are measured by:

- the general purpose and requirements of the activity;
- the need and desirability of the activity;
- opportunity costs;
- the need to avoid and/or minimise negative impacts;
- the need to maximise benefits; and
- how it impacts on the community that may be affected by the activity (DEA&DP, 2013b).

Alternatives considered for the proposed see potato pivots include two layout alternatives and a no-go option. The following section describes those alternatives that have been considered (i.e. identified and investigated) and indicate which alternatives are deemed to be "feasible" and "reasonable" and therefore preferred. It also indicates and compares the advantages and disadvantages of these alternatives.

6.1 LOCATION ALTERNATIVES

The applicant owns a number of farms within a surrounding 45 km region of the proposed development areas. The overwhelming majority of the undeveloped farms owned by the applicant either fall within a Critical Biodiversity Area one (CBA 1) or Critical Biodiversity Area two (CBA 2) in accordance with the NCSBP. A minor portion of the farms to the north owned by the applicant falls within Ecological Support Areas (ESA) or Other Natural Areas (ONA) in accordance with this Plan.

The majority of the undeveloped farms owned by the applicant either fall within the Kimberley Thornveld (SVk 4) or Vaalbos Rocky Shrubland (SVk 5) vegetation types. The Kimberley Thornveld vegetation type (SVk 4) is mainly associated with the nesting habitat and foraging grounds of the critically endangered Red Data Listed bird species Gyps africanus (African white-backed vulture) as well as suitable habitat and soil conditions for the presence of the nationally protected tree species Vachellia erioloba (Camel thorn) & Vachellia haematoxylon (Grey camel thorn). Only small isolated portions of a number of farms owned by the applicant, which are traversed by significant watercourses, fall within the Upper Gariep Alluvial vegetation type (Aza 4). These portions however all either fall within a Critical Biodiversity Area two (CBA 2) or Critical Biodiversity Area one (CBA 1).

From an alternative site / property location point of view for the proposed developments, it is therefore evident that the applicant has limited options for developing on other sites/farms which would avoid or limit ecological impacts on CBAs or protected/Red Data Listed species.

Therefore, given the significance of residual impacts and scope for mitigation, it is recommended that Alternative 2 for the Remaining Extent of the Farm Zulani no 167 be considered for development due to those alternatives mostly falling outside the CBA 2 and constituting relatively smaller development footprints. Pursuing these options would ensure that the direct footprint impact on the ecologically sensitive CBA 2 is avoided as far as practicably possible. It would also ensure that a proportion of the direct footprint impact on the nesting habitat and foraging grounds of critically endangered birds and on nationally protected trees could be avoided.

6.2 LAYOUT ALTERNATIVES

During the scoping phase of the project three layout alternatives have been evaluated, however, due to valuable progress made on one of the applicant other projects, the layouts for the proposed development have changed to only two layout alternatives which differ slightly from the ones evaluated in the scoping phase. It has to be noted that although the layouts have changed slightly, the area in which the development will take place, remains exactly the same. In other words, some minor internal layouts have changed as per description below.

Layout Alternative 1 (Preferred Layout Alternative)

The Preferred Layout alternative (Alternative 1) includes the development of seventeen (17) 45 ha seed potato pivots. Twelve (12) of the proposed 45ha pivots are located to the Northern part of the remaining Extent of the Farm Zulani 167 which is located outside the Critical Biodiversity Area 2, while five (5) of the proposed 45ha pivots are located to the centre-left and south of the development area which is located in a Critical Biodiversity Area 2.

Figure 8: Zulani Preferred Alternative (Alternative 1)

Layout Alternative 2

Layout Alternative 2 includes the development of fourteen (14) 45 ha seed potato pivots. Twelve (12) of the proposed 45ha pivots are located to the Northern part of the remaining Extent of the Farm Zulani 167 which is located outside the Critical Biodiversity Area 2, while two (2) of the proposed 45ha pivots are located to the centre-left of the development area which is located in a Critical Biodiversity Area 2.

Figure 9: Zulani Alternative 2

6.3 NO-GO OPTION

Advantages of not Developing

The negative environmental impacts associated with the proposed project and its alternatives as identified under Section 9 will be avoided if the proposed project is not implemented. If the proposed project not proceed, the socio-economic condition especially regarding job creation will be lost. This will result in nearly 300 job opportunities being lost. The low crazing capacity of the current land will be unchanged resulting in a further negative socio economic impact.

Disadvantages of not developing

If the proposed project however does not go ahead, the local communities will forego the economic benefits which the project will have on the area such as immediate additional employment opportunities and revenue streams and most importantly, sustainable capacity building (skills, experience and resources development) for the future. This will result in nearly 300 job opportunities being lost. The low crazing capacity of the current land will be unchanged resulting in a further negative socio economic impact.

7. DESCRIPTION OF THE ENVIRONMENT

The following section provides an overview of the bio-physical as well as the socio-economic environments of the proposed project. The table below (table 11) indicates the list of specialist studies that were conducted during the assessment process:

Table 11: List of Specialist Studies Conducted

Specialist Name	Organisation	Specialist Assessment Type
Mr. Rikus Lamprecht	EcoFokus Consulting	Ecological and Wetland Impact Assessment
Mr. Rikus Lamprecht *(External Reviewed by Mr. Mark Botha and Me. Susie Brownlie).*	EcoFokus Consulting	Ecological Offset Report
Dr. Lloyd Rossouw	Palaeo Field Services	Archaeological and Palaeontological Impact Assessment (Heritage Assessment)
Dr. George van Zijl	Digital Soils Africa	Soil Suitability Assessment
Mr. C.W Vermeulen *(External Reviewed by Mr. Lukas Niemand).*	Hystrix	Avifaunal Impact Assessment

7.1 BIO-PHYSICAL DESCRIPTION

This section provides a comprehensive description of the bio-physical environment of the proposed project area.

7.1.1 Climate

The rainfall of the region peaks during the summer months and the Mean Annual Precipitation (MAP) of the area is approximately 334 mm (www.climate-data.org). The maximum average monthly temperature is approximately 26.3°C in the summer months while the minimum average monthly temperature is approximately 9.8°C during the winter. Maximum daily temperatures can reach up to 34.7°C in the summer months and dip to as low as 1.5°C during the winter.

7.1.2 Geology and Soils

According to Mucina & Rutherford (2006) the geology of the landscape and associated vegetation type can be described as the following:

The flat to slightly undulating plains are characterised by Andesitic lavas of the Allanridge formation in the northern and western sections of the vegetation type. Deep sandy to loamy soils of the Hutton soil form are mainly present.

The scattered hills within the plains are associated with highly fragmented, extensive dolerite sills which form ridges, plateaus and slopes of the koppies. Rock and boulder covered slopes mainly constitute stony Mispah and gravel-rich Glenrosa soil types.

7.1.3 Topography

The proposed project area is mainly characterised by a wide, flat open plain consisting of deep sandy to loamy soils of the Hutton soil form. A slightly elevated rocky ridge area with well drained soils is also present in the southern section of the proposed project area. The topography of the area varies between 1036 to 1074 MASL.

7.1.4 Ecological and Vegetation Conservation Status

An Ecological and Wetland Impact Assessment was conducted for the proposed project area in order to determine the ecological value/significance and subsequent conservational importance and sensitivity of the area. The potential impacts that the proposed project will have on the ecology of the area were identified and evaluated to determine possible mitigation measures which could be implemented in order to acceptably reduce the significance of the associated impacts. Please see appendix E for the full Ecological Specialist Study. The section below describes the General Vegetation and Conservation status.

According to SANBI (2006-), the entire proposed Zulani surface footprint area falls within the Kimberley Thornveld vegetation type (SVk 4) which is characterised by slightly irregular plains with a well-developed woody component (tree and shrub layer). The herbaceous layer is usually open with much uncovered soils.

This vegetation type is classified as least threatened because of its broad distributions and it being mostly excluded from being utilised for intensive agricultural cultivation activities (SANBI, 2006-).

The northern portion of the proposed Zulani surface footprint area is classified as ‘other natural area’ in accordance with the Northern Cape Provincial Spatial Biodiversity Plan 2016 (NCSBP). The south-western portion however falls within a Critical Biodiversity Area two (CBA 2) in accordance with the NCSBP. Critical Biodiversity Areas are areas that are irreplaceable or near-irreplaceable for reaching certain minimum required provincial biodiversity targets for ecosystem types, species or ecological processes (Collins, 2017). Such an area must be maintained in a natural or near-natural state in order to meet biodiversity targets (Collins, 2017).

The proposed agricultural development will in all probability completely transform the majority of the existing surface vegetation on the footprint area.

See vegetation and sensitivity maps below.

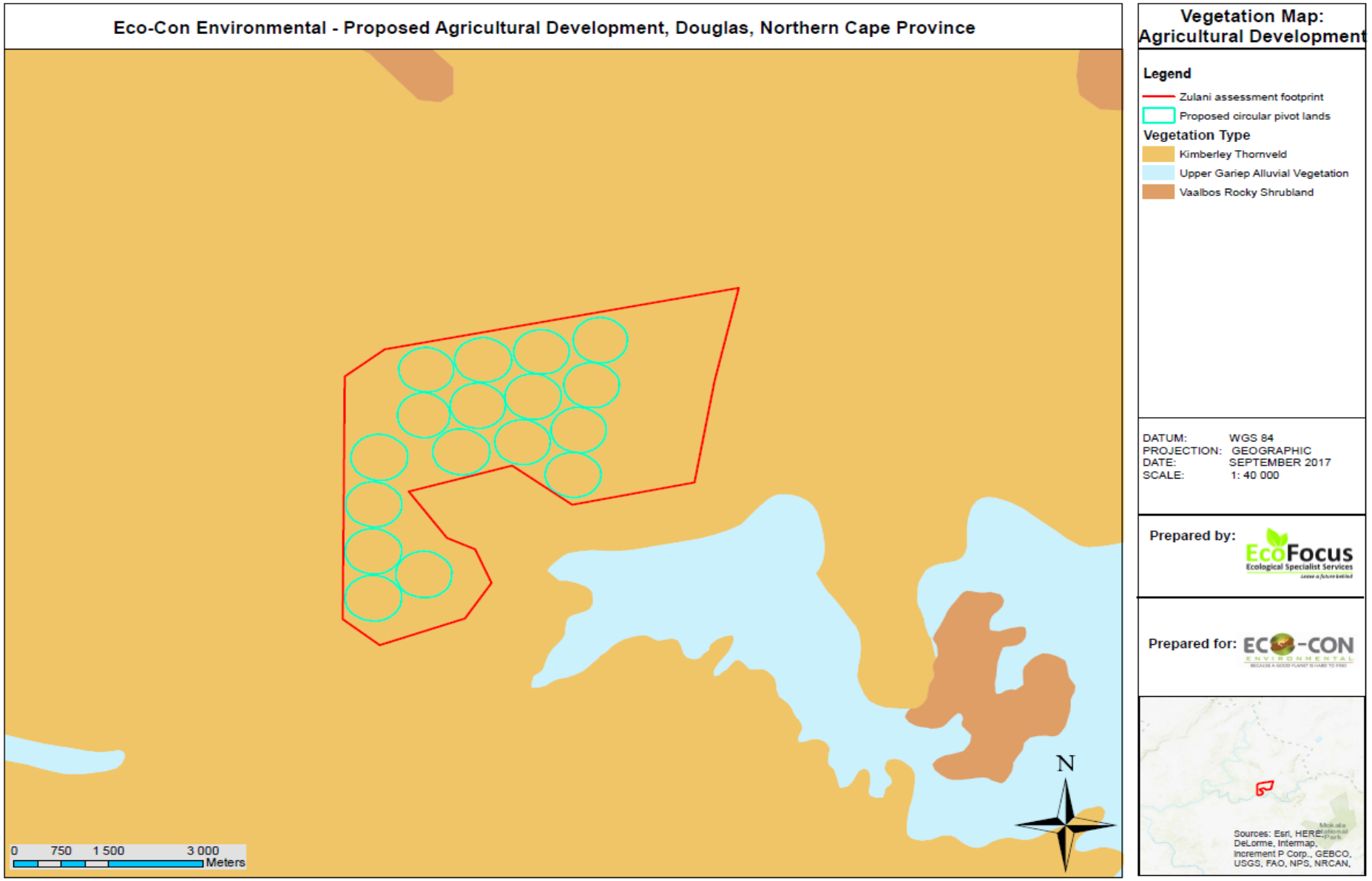


Figure 10: Vegetation map of the proposed project layout (see Appendix B for an A3 size version)

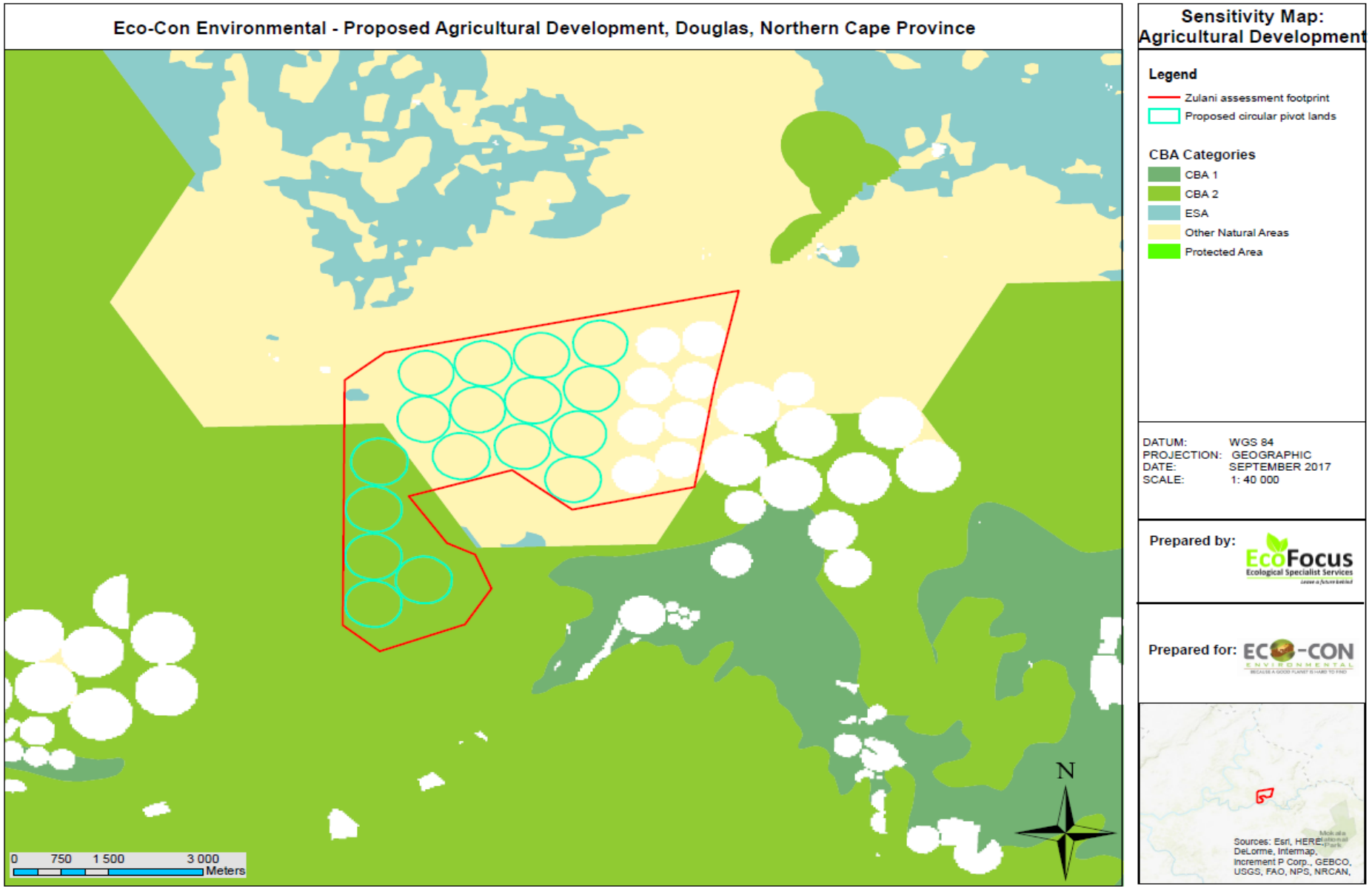


Figure 11: Ecological sensitivity map of the proposed project layout (see Appendix B for an A3 size version)

7.1.4.1 Terrestrial environment

Results and Discussion of the Specialist Report

The proposed project area can roughly be divided into two sections based on landscape structure and condition of vegetation/extent of degradation:

- Northern development portion associated with 'other natural land'
- Southern development portion associated with a Critical Biodiversity Are two (CBA 2)

Each of the sections will now be discussed:

Northern development portion associated with 'other natural land'

The surface vegetation associated with the most northerly situated 12 centre pivot lands of approximately 45 ha in size each, consists of a homogenous relatively flat to gently sloping open savannah landscape of which the woody component mainly consists of single stemmed trees. Multi-stemmed trees or shrubs are however also present in relatively high numbers. The area forms part of a broad, continuous surrounding savannah landscape associated with the Kimberley Thornveld vegetation type (SVk 4) of which the veld and vegetation is in a natural, relatively pristine condition. Significant numbers of agricultural cultivation developments are present within the broader surrounding areas but are mainly restricted to around the Riet River system. The soils of the area mainly constitute deep sandy red soils with a low rocky coverage which is representative of the relevant vegetation type.

The dominant tree species present is *Vachellia erioloba* (nationally protected) while the tree species *Vachellia haematoxylon* (nationally protected) is also present but to a significantly lesser extent. The average density of trees within the footprint area amounts to approximately 20 trees/ha which equates to a total estimate of approximately 10 800 trees within the footprint area which will need to be removed. Shrubs found to be present mostly include *Vachellia erioloba* (nationally protected) and *Vachellia haematoxylon* (nationally protected). The species *Vachellia tortilis, Senegalia mellifera, Ziziphus mucronata, Grewia flava, Asparagus spp., Ehretia rigida, Tarchonanthus camphoratus* and *Rhigozum trichotomum* are present in low numbers. Forbs include *Crotalaria orientalis, Felicia spp., Eriocephalus aspalathoides, Chrysocoma obtusata, Acrotome inflata, Helichrysum obtusum* and *Oxalis semiloba* (provincially protected). *Drimia spp*. are also expected to be present in accordance with information received from the applicant. Only the species *Drimia nana* is however provincially specially protected. The grass layer is dominated by the species *Schmidtia pappophoroides*, *Eragrostis lehmanniana, Aristida diffusa* and *A congesta*. Other grasses include *Heteropogon contortus, Enneapogon cenchroides, Pogonarthria squarrosa, Stipagrostis obtusa* and *Eragrsotis obtusa*.

Figure 12: Image illustrating the landscape of the northern development portion

With the exception of the two nationally protected tree species and provincially protected species Oxalis semiloba, no Red Data Listed or other provincially protected or any other plant species of conservational significance were found to be present within this portion of the proposed project area. It is however recommended that an additional ecological walkthrough be conducted prior to commencement of the project during the flowering period of underground bulbous plant species. This will ensure that no provincially protected or significant species have potentially been omitted.

Although the proposed Zulani surface footprint area does not fall within any Important Bird Areas (IBA) as per the latest IBA map obtained from the Birdlife SA website (www.birdlife.org.za/conservation/important bird areas/iba-map), two active nests of the African white-backed vulture (*Gyps africanus*), which is a critically endangered Red Data Listed species, were encountered atop large *Vachellia* trees. The separate Avifaunal Impact Assessment conducted for the proposed project, indicted the presence of six active nests. It is however highly likely that there are more active nests present in the area as the larger area provides important foraging grounds. Numerous large congregated nests of sociable weavers (*Philetairus socius*) (provincially protected) are also scattered throughout the footprint area. Although no snakes were encountered due to the timing of the site visit, these nests often also house various snake species which feed on the chicks and adult birds. No other unique or important habitats for nesting sites where observed.

Figure 13: Image illustrating the presence of active nests of the critically endangered African white-backed vulture (*Gyps africanus*)

Signs of mammals traversing the area, such as the common warthog (Phacochoerus africanus), duiker (Sylvicapra grimmia) and steenbok (Raphicerus campestris) which are all provincially protected are evident. This subsequently means that various meso-predators are also highly likely to be present. These species naturally utilise the area for breeding and/or persistence habitat but, their mobility and the broad, continuous surrounding savannah landscape allows for individuals to simply leave an area where disturbance is taking place and disperse to other similar, adequate areas.

The Present Ecological State (PES) of the northern development portion is classified as Class B as it is largely natural. A small change in natural habitats and biota may have taken place due to the 'ecological edge effect' caused by the adjacently located cultivated pivot lands, the R 357 provincial road and anthropogenic farm management practises but the ecosystem functionality has remained essentially unchanged.

The portion forms part of the Kimberley Thornveld vegetation type (SVk 4) which is classified as least threatened (SANBI, 2006-) and the area is also classified as 'other natural area' in accordance with the NCSBP. The Ecological Importance and Sensitivity (EIS) of the northern development portion is however classified as Class B (high) as it is ecologically important and sensitive on national scale due to the significant presence of nationally protected tree species and the presence of the critically endangered African white-backed vulture. The area is considered to be of high conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type and

protected/Red Data Listed species. Biodiversity is however still relatively ubiquitous due to the vast and homogenous surrounding landscape.

Southern development portion associated with a Critical Biodiversity Are two (CBA 2)

The surface vegetation associated with the most southerly situated 5 centre pivot lands of approximately 45 ha in size, is more heterogeneous compared to the northern development portion. It consists of a gently to moderately sloping rocky landscape to the north and east due to the presence of a ridge/hill associated with the Vaalbos Rocky Shrubland vegetation type (SVk 5). The soils become increasingly rockier and loamier in this area.

Due to this variation in soil conditions from the dominant deep sandy red soils, the density of the woody component increases significantly within this area. Although single stemmed trees such as *Vachellia erioloba* (nationally protected) and *Vachellia haematoxylon* (nationally protected) are still present in high numbers, their dominance is reduced and replaced by an increase in density of multi-stemmed shrubs and trees such as *Senegalia mellifera, Vachellia tortilis, Ziziphus mucronata* and *Grewia flava*. Approximately ten individuals of the nationally protected tree species *Boscia albitrunca* were also found to be present within the rocky areas. None of these individuals are to be removed during any development process without the required national and provincial flora permits being obtained. The shrub species *Asparagus spp., Ehretia rigida, Tarchonanthus camphoratus* and *Rhigozum trichotomum* are present in low numbers. Forbs include *Crotalaria orientalis, Felicia spp., Eriocephalus aspalathoides, Chrysocoma obtusata, Acrotome inflata, Helichrysum obtusum* and *Oxalis semiloba* (provincially protected). *Drimia spp*. are also expected to be present in accordance with information received from the applicant. Only the species *Drimia nana* is however provincially specially protected. The grass layer is dominated by the species *Schmidtia pappophoroides*, *Eragrostis lehmanniana, Aristida diffusa* and *A congesta*. Other grasses include *Heteropogon contortus, Enneapogon cenchroides, Pogonarthria squarrosa, Stipagrostis obtusa* and *Eragrsotis obtusa*.

Figure 14: Image illustrating the increased woody density towards the ridge/hills area as well as the presence of the provincially protected species *Boscia albitrunca*

The most southerly area of this portion however has a relatively sparse woody component and rather constitutes gently to moderately sloping open bottomland sparse savannah. The soils also constitute deep sandy red soils with a low rocky coverage. The woody component consists of mixture of small, single stemmed trees and multi-stemmed shrubs. The area forms part of a broad, continuous surrounding savannah landscape associated with the Kimberley Thornveld vegetation type (SVk 4) of which the veld and vegetation is in a natural, relatively pristine condition. It does not intrude into the sensitive riparian zone associated with the Rite River.

The dominant tree/shrub species present is *Vachellia haematoxylon* (nationally protected) while the tree species *Vachellia erioloba* (nationally protected) is also present but to a significantly lesser extent. The average density of trees within this portion amounts to approximately 15 trees/ha which equates to a total estimate of approximately 2700 trees within the footprint area which will need to be removed. Forbs include *Crotalaria orientalis, Felicia spp., Eriocephalus aspalathoides, Chrysocoma obtusata, Acrotome inflata, Helichrysum obtusum* and *Oxalis semiloba* (provincially protected). *Drimia spp*. are also expected to be present in accordance with information received from the applicant. Only the species *Drimia nana* is however provincially specially protected. The grass layer is dominated by the species *Schmidtia pappophoroides*, *Eragrostis lehmanniana, Aristida diffusa* and *A congesta*. Other grasses include *Heteropogon contortus, Enneapogon cenchroides, Pogonarthria squarrosa, Stipagrostis obtusa* and *Eragrsotis obtusa*.

Figure 15: Image illustrating the landscape of the open bottomland sparse savannah

With the exception of the three nationally protected tree species and provincially protected species *Oxalis semiloba*, no Red Data Listed or other provincially protected or any other plant species of conservational significance were found to be present within this portion of the proposed project area. It is however recommended that an additional ecological walkthrough be conducted prior to commencement of the project during the flowering period of underground bulbous plant species. This will ensure that no provincially protected or significant species have potentially been omitted.

The proposed surface footprint area does not fall within any Important Bird Areas (IBA) as per the latest IBA map obtained from the Birdlife SA website (www.birdlife.org.za/conservation/important bird areas/iba-map). The low height woody component and sparse savannah of the area also does not necessarily provide suitable nesting habitat for the African white-backed vulture (*Gyps africanus*) or congregated nests of sociable weavers (*Philetairus socius*) (provincially protected). Although no nesting sites are evident, the area still provides important foraging grounds for the African white-backed vulture (*Gyps africanus*). The separate Avifaunal Impact Assessment conducted indicated that these areas provide suitable African white-backed vulture habitat. No other unique or important habitats for nesting sites where observed.

Signs of mammals traversing the area, such as the common warthog (*Phacochoerus africanus*), duiker (*Sylvicapra grimmia*) and steenbok (*Raphicerus campestris*) which are all provincially protected are evident. This subsequently means that various meso-predators are also highly likely to be present. These species naturally utilise the area for breeding and/or persistence habitat but, their mobility and the broad, continuous

surrounding savannah landscape allows for individuals to simply leave an area where disturbance is taking place and disperse to other similar, adequate areas.

The Present Ecological State (PES) of the southern development portion is classified as Class A as it is mainly unmodified, natural and pristine.

The portion forms part of the Kimberley Thornveld vegetation type (SVk 4) which is classified as least threatened (SANBI, 2006-). The portion however falls within a Critical Biodiversity Area two (CBA 2) in accordance with the NCSBP. Critical Biodiversity Areas are areas that are irreplaceable or near-irreplaceable for reaching certain minimum required provincial biodiversity targets for ecosystem types, species or ecological processes (Collins, 2017). Such an area must be maintained in a natural or near-natural state in order to meet biodiversity targets (Collins, 2017). The three most southerly situated pivot lands form part of a larger continuous ecological corridor associated with the Riet River catchment and riparian zone. Due to their significant distance away from the Riet River, the two northerly situated pivot lands of the southern development portion do not necessarily form an integral part of the ecological corridor associated with the Riet River catchment and riparian zone relative to the three most southerly situated pivot lands, but are still classified as CBA 2. The Ecological Importance and Sensitivity (EIS) of the southern development portion is therefore classified as Class B (high) as it is ecologically important and sensitive on provincial or possibly national scale for the persistence of the CBA 2 ecological corridor and due to the significant presence of nationally protected tree species. The area is considered to be of high conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type, CBA 2 and protected/Red Data Listed species.

7.1.4.2 Streams & Wetlands

Three separate, confined water bodies are present within the proposed Zulani surface footprint area. They are located within the north-western, north-eastern and southern portions of the area respectively. None of these water bodies will be directly or significantly impacted upon by the layout of the proposed new centre pivot lands.

The north-westerly situated water body forms the eastern boundary of a larger ephemeral catchment area which accumulates water from the west. It is surrounded by an area with an increased density of the woody component. Although single stemmed trees such as *Vachellia erioloba* (nationally protected) and *Vachellia haematoxylon* (nationally protected) are still present in high numbers, their dominance is reduced and replaced by an increase in density of multi-stemmed shrubs and trees such as *Senegalia mellifera, Vachellia tortilis, Ziziphus mucronata* and *Grewia flava*. The forb species *Lotononis listii* was also encountered in this area. The nearest proposed new centre pivot land to this water body is situated approximately 550 m to the

east and the proposed development should therefore not have any significant effect on the flow (coming from the west) or integrity of this water body.

Figure 16: Image illustrating the presence of the north-westerly situated water body

Figure 17: Image illustrating the increased woody density of the area surrounding the north-westerly situated water body

The north-easterly situated water body constitutes a completely isolated and confined depression area which will only accumulate and hold water during significant rainfall events. Several large *Vachellia erioloba*

(nationally protected) individuals are present within the depression which confirms its lack of significant and uninterrupted water retention. The nearest proposed new centre pivot land to this water body is situated approximately 100 m to the south (which is topographically lower) and the proposed development should therefore not have any significant effect on the flow or integrity of this water body. It should however be included in the Water Use License Application (WULA) submission if required by the Department of Water and Sanitation in accordance with the National Water Act (Act 36 of 1998)

Figure 18: Image illustrating the presence of the south-easterly situated water body

The southerly situated water body constitutes an artificial dam which accumulates water from the topographically higher ridge/hill area to the east. The nearest proposed new centre pivot land to this water body is situated approximately 100 m to the west (which is topographically lower) and the proposed development should therefore not have any significant effect on the flow or integrity of this water body. It should however be included in the Water Use License Application (WULA) submission if required by the Department of Water and Sanitation in accordance with the National Water Act (Act 36 of 1998).

7.1.4.3 Conclusions and Recommendations

The proposed development will in all probability completely transform the existing surface vegetation on the proposed Zulani surface footprint area. The area forms part of a broad, continuous surrounding savannah landscape mainly associated with the Kimberley Thornveld vegetation type (SVk 4) of which the veld and vegetation is in an undisturbed, natural and relatively pristine condition. The area therefore scored a high PES value.

The dominant tree species present within the footprint area is *Vachellia erioloba* (nationally protected) while the species *Vachellia haematoxylon* (nationally protected) is also well represented. The average density of trees within the footprint area amounts to approximately between 15 trees/ha and 20 trees/ha which equates to a total estimate of approximately 14 400 trees within the footprint area which will need to be removed.

Two active nests of the African white-backed vulture (*Gyps africanus*), which is a critically endangered Red Data Listed species, were encountered atop large *Vachellia* trees. The separate Avifaunal Impact Assessment conducted for the proposed project, indicted the presence of six active nests. It is however highly likely that there are more active nests present in the area as the larger area provides important foraging grounds. Numerous large congregated nests of sociable weavers (*Philetairus socius*) (provincially protected) are also scattered throughout the footprint area.

The northern development portion of the proposed Zulani surface footprint area is classified as 'other natural area' in accordance with the NCSBP. The southern development portion however falls within a Critical Biodiversity Area two (CBA 2) in accordance with the NCSBP. Critical Biodiversity Areas are areas that are irreplaceable or near-irreplaceable for reaching certain minimum required provincial biodiversity targets for ecosystem types, species or ecological processes (Collins, 2017). Such an area must be maintained in a natural or near-natural state in order to meet biodiversity targets (Collins, 2017). The area forms part of a larger continuous ecological corridor associated with the Riet River catchment and riparian zone. The Ecological Importance and Sensitivity (EIS) of the proposed project area is therefore classified as Class B (high) as it is ecologically important and sensitive on provincial and national scale for the persistence of the CBA 2 ecological corridor and due to the significant presence of nationally protected tree species and the presence of the critically endangered African white-backed vulture. The area is considered to be of high conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type, CBA 2 and protected/Red Data Listed species.

It is the opinion of the specialist that, by application of the NEMA Mitigation Hierarchy, the significance of residual impacts associated with transformation of the CBA 2 and destruction of nationally protected tree species and critically endangered bird species habitat cannot be suitably reduced and mitigated to within acceptable levels for Alternative 1. This must therefore be seen as a fatal flaw for the proposed Alternative 1 and it is therefore not recommended that Alternative 1 be considered.

Although Alternative 2 will result in the most southerly situated three pivot lands of the southern development portion of the proposed project associated with the CBA 2 being left in situ and therefore not being significantly impacted upon, the significant presence of nationally protected tree species and the presence of the critically endangered African white-backed vulture habitat within Alternative 2 will still pose a significant

residual impact. The two most southerly situated pivot lands of Alternative 2 are also associated with the CBA 2 but due to their significant distance away from the Riet River, these two pivot lands are not necessarily regarded as forming an integral part of the ecological corridor associated with the Riet River catchment and riparian zone relative to the three most southerly situated pivot lands.

By application of the NEMA Mitigation Hierarchy, the significance of residual impacts cannot be adequately mitigated to within acceptable levels other than investigating the potential implementation of an ecological offset as mitigation. The only potentially suitable mitigation option would be for the applicant to make available a suitable ecological offset area which can be formally protected in order to compensate for the significant destruction of the CBA 2, nationally protected tree species and nesting sites and foraging grounds of the critically endangered species.

It is recommended that Alternative 2 be considered due to the smaller impact footprint. If Alternative 2 is considered, the applicant must make available a suitable ecological offset area which can be formally protected in order to compensate for the transformation of the proposed project area. A comprehensive Offset Feasibility Assessment and Report will have to be conducted and compiled in order to identify and inform on an area of suitable size and ecological value which could meaningfully contribute to the regional and provincial biodiversity management requirements and strategies. The proposed Offset Feasibility Assessment and Report will have to be evaluated by the relevant departments in order to inform on their approval/rejection process

See specialist report in Appendix E2.

7.1.5 Agriculture and Soil Suitability Assessment

A Soil and Irrigation Suitability Assessment was conducted for the proposed project area in order to determine the agricultural value of the area. Digital Soils Africa conducted an irrigation potential soil survey for a 1404 ha field on the Remainder of the farm Zulani No. 167 in order to assess the suitability of the area for pivot irrigation for seed potatoes.

7.1.5.1 Soils forms

The soils encountered during the survey are shown in the table below (table 12).

Table 12: Soil form encountered

Soil Form	A Horizon	B Horizon	B2/C Horizon	Nr of Profiles
Addo	Orthic A	Neocarbonate B	Soft carbonate	2

Coega	Orthic A	Hardpan Carbonate		1
Hutton	Orthic A	Ned Apedal B	Unspecified	222
Mispah	Orthic A	Rock		1
Plooysburg	Orthic A	Ned Apedal B	Hardpan Carbonate	11
Prieska	Orthic A	Neocarbonate B	Hardpan Carbonate	3

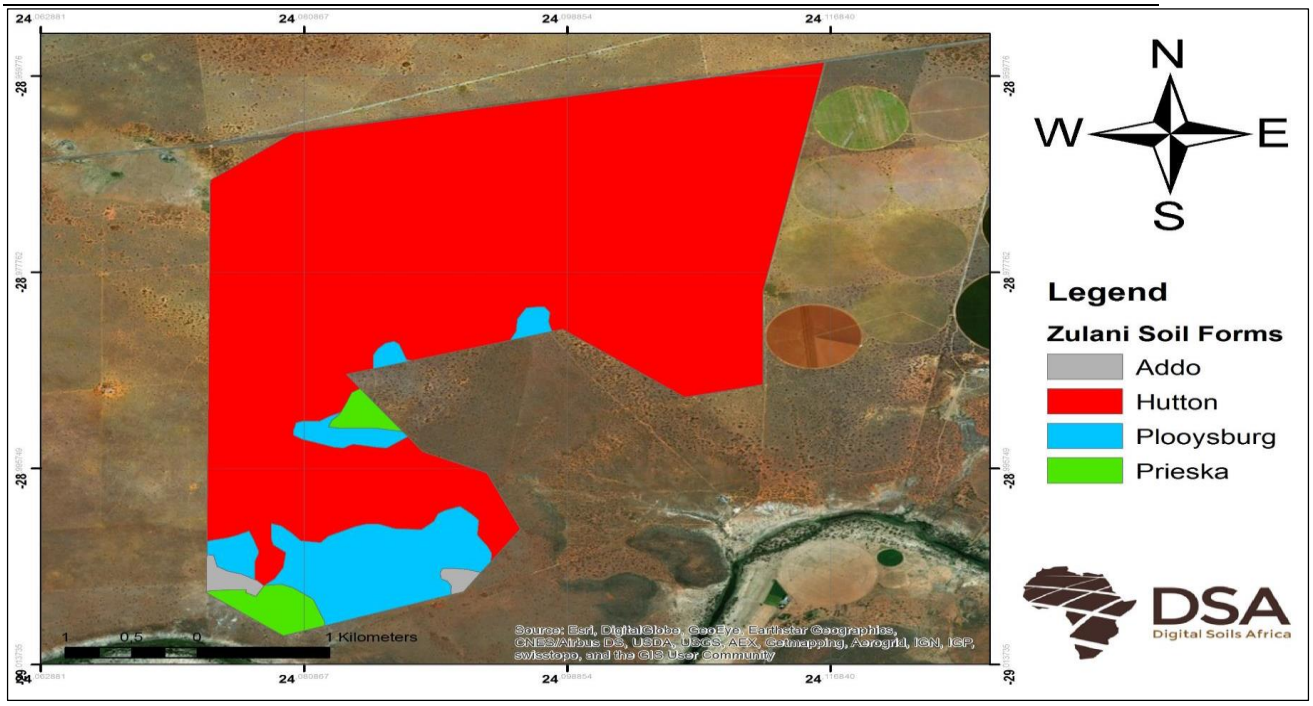


Figure 19: Illustration of soil forms encountered

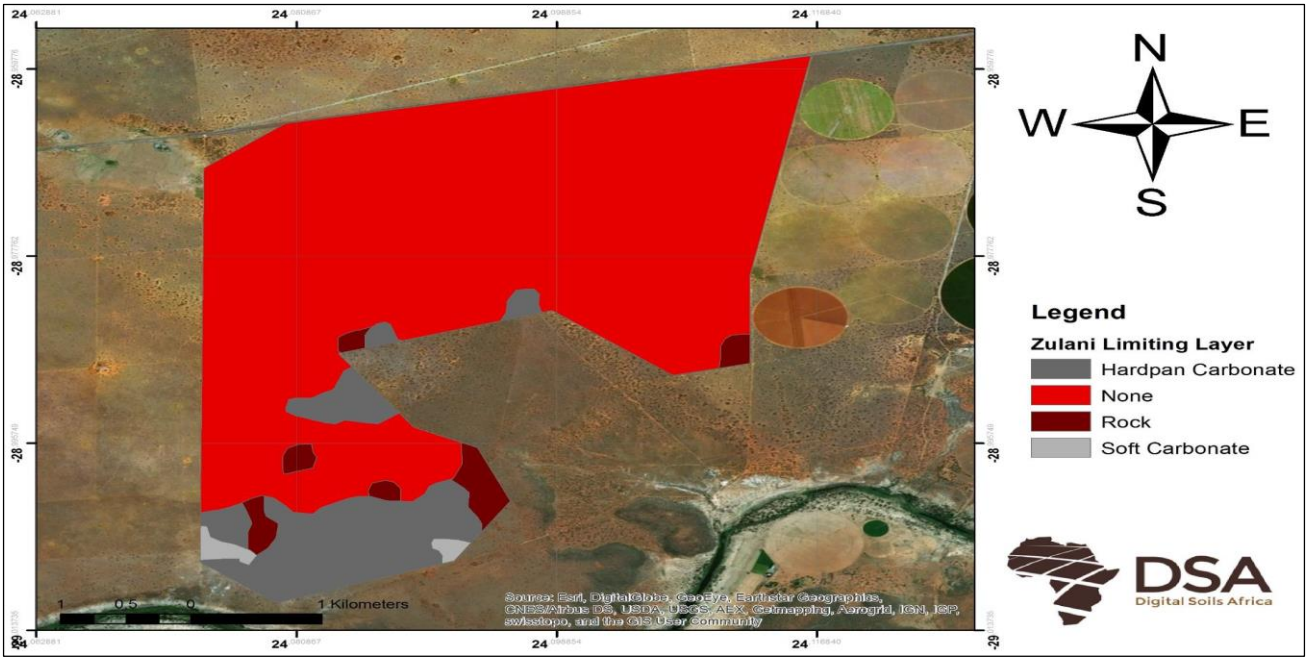


Figure 20: Illustration of infiltration limiting material

7.1.5.2 Soil Depth

The freely drainable depth (Figure 21 below) is the depth up to where the water can freely drain. It includes the depth of the orthic A, red apedal B, yellow brown apedal B and neocarbonate B horizons. The drainable depth is the same as the freely drained depth, with the exception of 200 mm added when a soft carbonate is the limiting layer, to accommodate potential infiltration into the soft carbonate horizon. Where no limiting layer was reached, the freely drainable depth and drainable depth was regarded as greater than 2 000 mm. In general, the soils of Zulani are very deep, and is good for irrigation. The soil at Zulani is shallower in the south of the site, as well as at a few spots near the middle of the site.

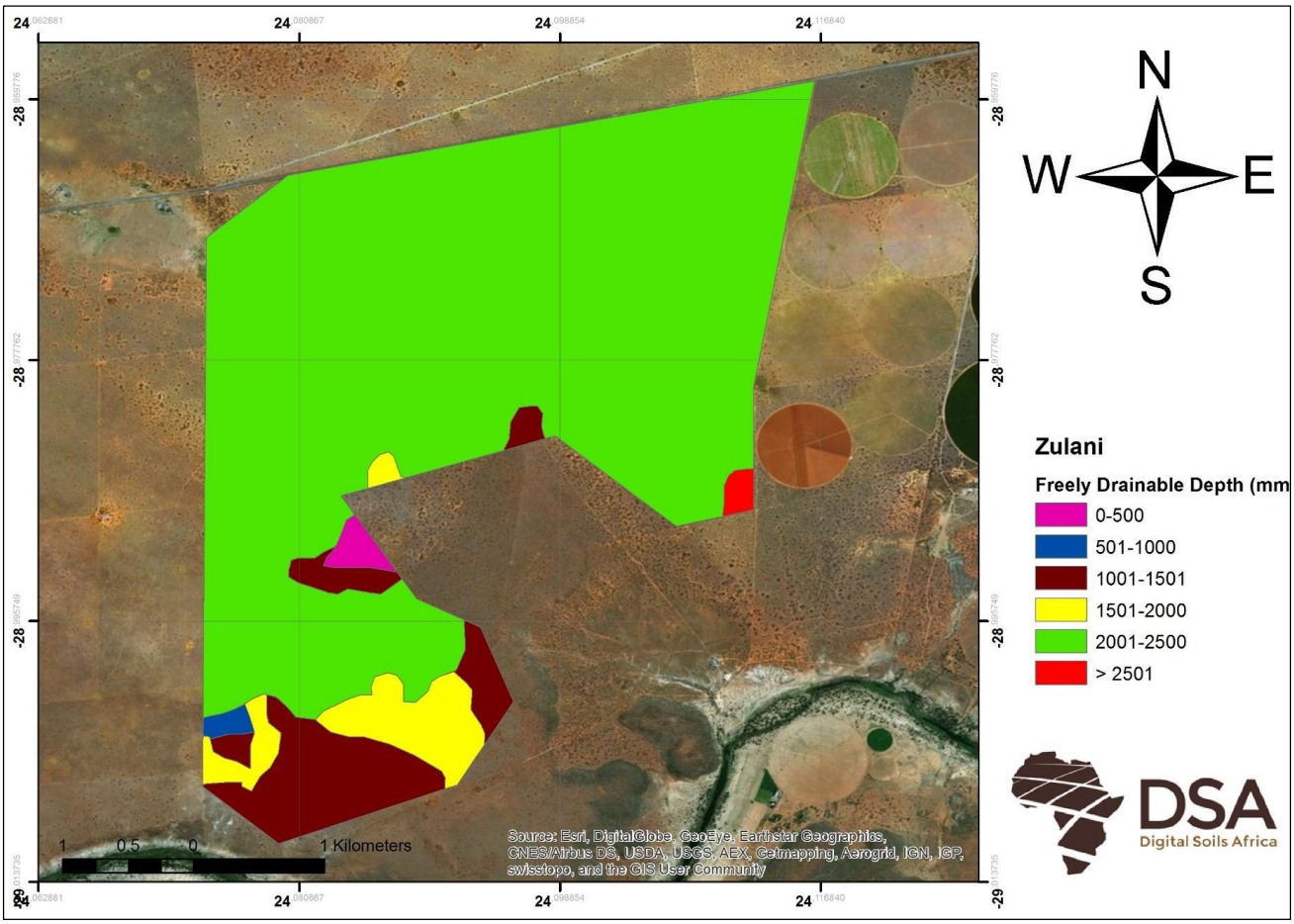


Figure 21: Illustration of drainable depths

7.1.5.3 Suitability

Based on soil morphology and laboratory analysis, the following areas are considered suitable for irrigation (Figures 22). For ease of monitoring, the areas are created in right shapes as seen in the figure below. The suitable areas cover 1 266 ha at Zulani.

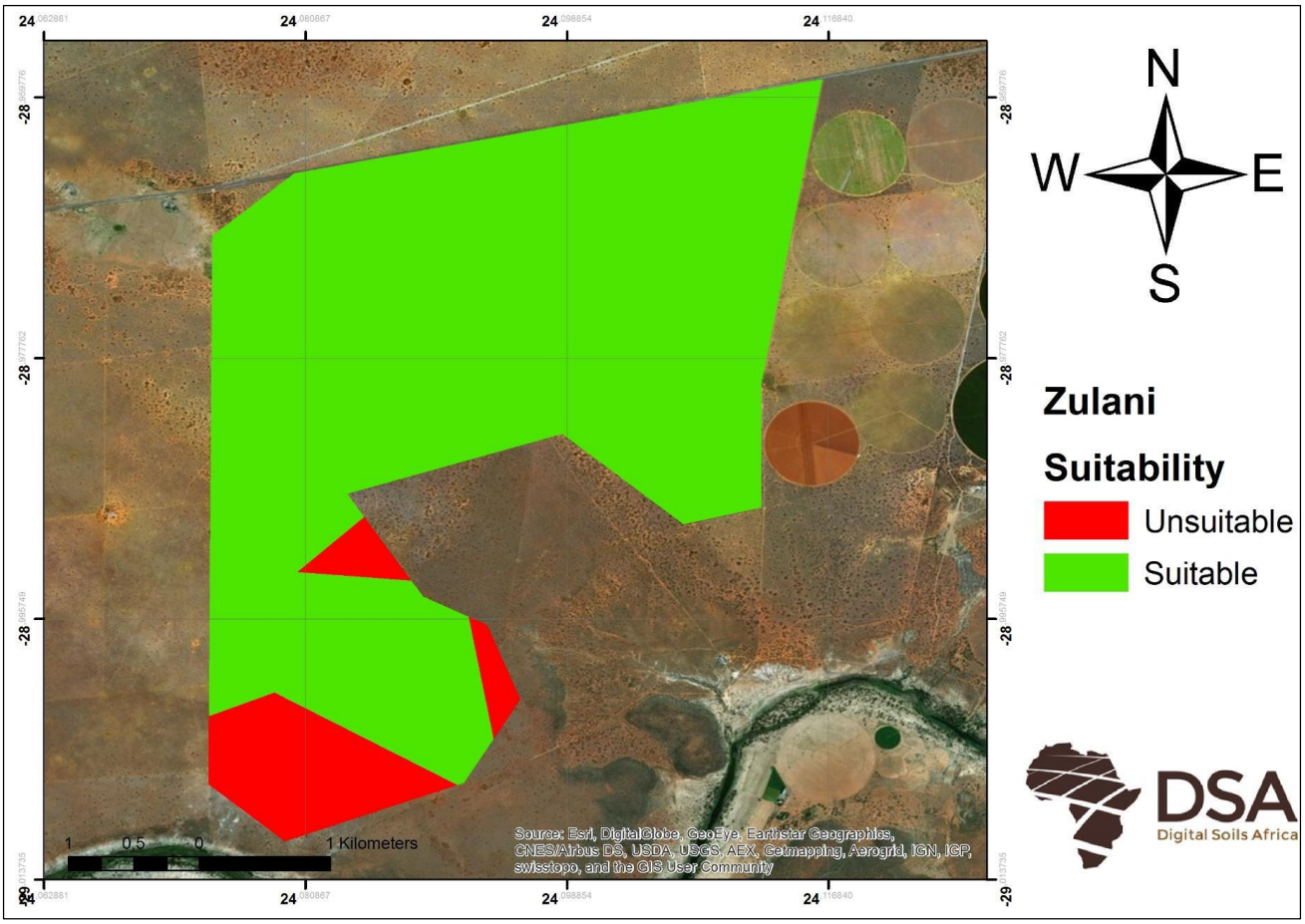


Figure 22: Illustration of suitability of the proposed project area

7.1.5.4 Conclusion

Pedological results indicate that 1262 ha of the 1404 ha is suitable for seed potato pivot irrigation.

See specialist report in Appendix E4.

7.1.6 Heritage

A Phase 1 Heritage Impact Assessment was conducted for the proposed project area in order to determine the heritage value of the area as well as identify and evaluate the potential impacts that the proposed project will have on any areas of historical significance. This information was then used to determine possible mitigation measures which could be implemented in order to reduce the significance of the associated impacts. An overview of the heritage aspects surrounding the proposed project is provided in the section below:

The study area is located within a historically as well as prehistorically significant landscape. However, the field assessment indicates that the proposed pivot development will primarily affect geologically recent soils in the form of well-developed wind-blown sand. The base of aeolian Kalahari Group sands,

which cover vast areas in the region, have previously produced localized densities of Early and Middle Stone Age artifacts, but given that pivot farming largely effect the uppermost soil layer, impact on potentially intact Stone Age archaeological remains within the footprint is considered unlikely. Given the nature of the proposed development (installation of aboveground pivots), the terrain is not considered archaeologically vulnerable and is assigned a site rating of Generally Protected C *(See attached **Appendix E3** for Heritage study).*

7.1.7 Avifaunal

During the EAP`s initial site inspection, the EAP noticed the presence of the White-backed Vulture (*Gyps africanus*). The EAP therefore thought it well to appoint an Avifaunal specialist as part of the specialist studies for this report. The findings of the Avifaunal study are listed below:

7.1.7.1 Field Survey

A nine-and-a-half-hour field survey was conducted on the study area on the 27th September 2017. Before conducting the field survey, a desktop assessment was conducted to document the prevalent avifaunal species occurring on or near the study area. A list of expected species was compiled and used as a reference during the field surveys to ensure that bird species that should theoretically occur were not overlooked. All distinct avifaunal habitats were identified on site, after which each habitat was assessed to record the associated avifaunal species present in that specific habitat. Species were identified by actual sightings, calls as well as signs of presence in the form of eggshells, nests, droppings and feathers. Where necessary, species were verified using Sasol Birds of Southern Africa.

7.1.7.2 The occurrence of potential species

By using Southern Africa Bird Atlas Project 1 and 2 (SABAP2) a comprehensive species list could be compiled for the 2824CC quarter degree square (QDS) and within the 2855_2405 pentad. SABAP2 is the follow-up project to the Southern African Bird Atlas Project (for which the acronym was SABAP, and which is now referred to as SABAP1). This first bird atlas project took place from 1987-1991. The second bird atlas project started on 1 July 2007 and plans to run indefinitely. The project aims to map the distribution and relative abundance of birds in southern Africa. The field work for this project is done by more than one thousand nine hundred volunteers, known as citizen scientists. The unit of data collection is the pentad, five minutes of latitude by five minutes of longitude, squares with sides of roughly 9 km.

The initial list compiled for the species occurring in the QDS can however not be used as an accurate list in terms of the species actually occurring within the study area since it covers a larger area as well as a wider

variety of habitats. In order to compile an accurate species list for the study area, all the species previously recorded in and around the 2824CC QDS were considered and added or eliminated on account of the habitat present on the study area as well as the habitat preferences of each of the species previously recorded within the larger QDS.

7.1.7.3 Threatened and Near Threatened bird species

By consulting the SABAP2 data basis, all the threatened (referring to IUCN categories Critically endangered, endangered and vulnerable) and/or near threatened bird species previously recorded within and surrounding the 2824CC QDS were added to the initial reference list of species that could potentially occur on or near the study area. All the threatened species occurring in or around the study area were reviewed (Roberts VII, Hockey *et al.* 2005; Taylor *et al.,* 2015*)* before conducting the field survey. During the field survey special attention was paid to identify any signs such as; actual sightings, suitable habitat, nest sites, suitable hunting/ foraging habitat or roosting spots pointing to the presence of these species.

7.1.7.4 Results

Avifaunal Habitat Assessment:

During the habitat assessment three distinct bird habitats were identified within the study area. These habitats include: *Vachellia* erioloba dominated savanna, *Senegalia mellifera* dominated Alluvial Vegetation and Agricultural land. (Figure 23). All the habitats identified on the study area are individually discussed.

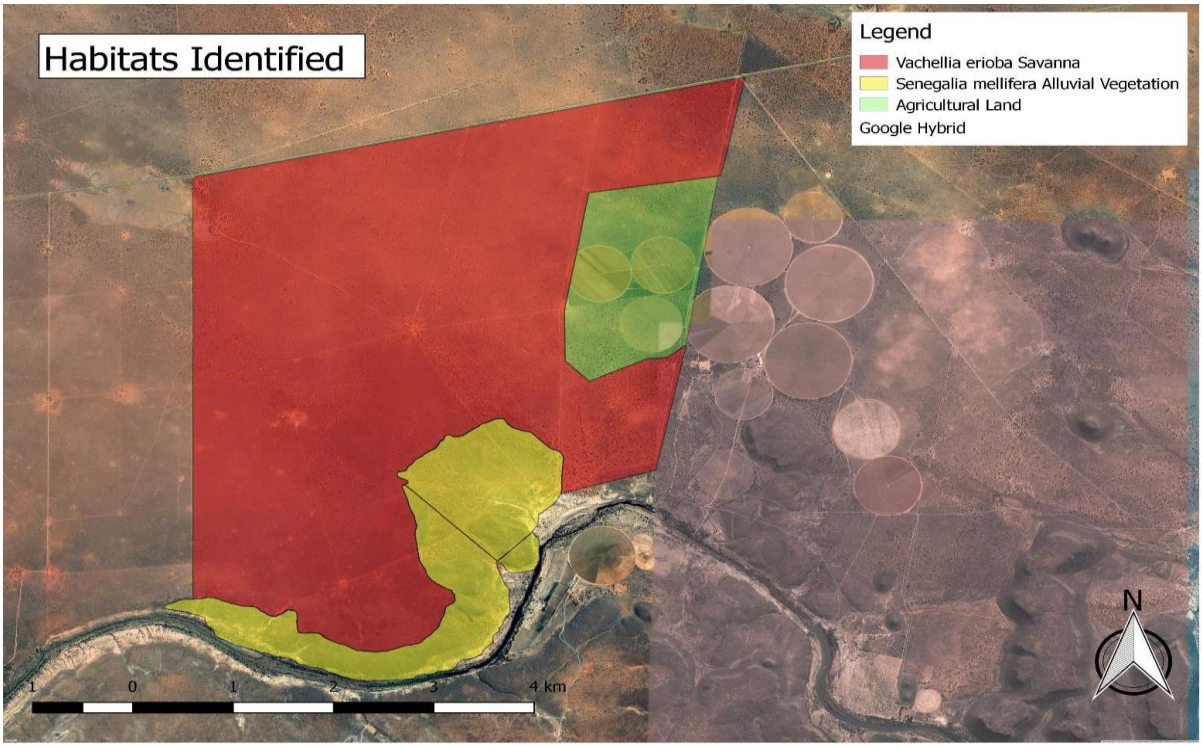


Figure 23: Habitats Identified

Vachellia erioloba Savanna

The *Vachellia erioloba* dominated Savanna study unit contains a large number of mature trees including by *Vachellia haematoxylon*, *Senegalia mellifera* and *Ziziphus mucronata* interspersed with various grass species dominated by the genera *Eragrostis*, silky awn grasses *Stipagrostis* and stick grasses *Aristi*da (Figure 24). This study unit supports an overall high species composition with an apparent high number of bird individuals. Some of the bird species observed within this study unit includes; Crimson-breasted Shrike (*Laniarius atrococcineus*), White-fronted Bee-eater (Merops bullockoides), Pygmy Falcon (*Polihierax semitorquatus*), Red-crested Korhaan (*Lophotis ruficrista*) and Black-shouldered Kite (*Elanus caeruleus*). The largest part of this study unit remains in a natural state with very good connectivity to the west and north, and a moderate connectivity to the east. This study unit provides the optimal habitat for a number of the threatened and near threatened bird species expected to occur within the larger study area of which Martial Eagle (*Polemaetus bellicosus*) EN and White-backed Vulture White-backed Vulture (*Gyps africanus*) CR were recorded during the field survey. Six active White-backed Vulture nests were recorded within the study unit during the field survey. Even though only six active white-backed Vulture nests were recorded during the field survey, it is reasonable to deduct that this study unit contains a much larger number of nests. This statement is based on the large size of the study unit, which makes it increasingly difficult to observe and record nest sites, along with the abundance of Vultures recorded within the study unit during the field survey. Vulture nests can easily be overlooked due to the fact that canopies of *A. erioloba* nest trees are often significantly convex and vultures do not always nest at the apex of the tree. This in conjunction with the dens leave cover of the trees makes it difficult to state with confidence that all active nests on the study area was in fact recorded during the survey. A total of approximately 46 individual vultures were recorded. Apart from providing optimal breeding habitat for a number of threatened and near threatened species, this study unit also provides optimal foraging and hunting habitat for certain threatened and near threatened species such as Secretarybird (*Sagittarius serpentarius*) VU and Kori Bustard (*Ardeotis kori*) NT. On account of the aforementioned and the near natural state of the study unit together with the overall high avifauna species composition, this study unit was deemed highly sensitive from an avifaunal perspective.

Figure 24: *Vachellia erioloba* dominated Savanna

Senegalia mellifera dominated Alluvial Vegetation

The *Senegalia mellifera* dominated Alluvial Vegetation study unit consists of undulating shrubland with outcrops interspersed with a number of seasonal drainage lines. The majority of the study unit is situated on the southernmost section of the study area. *Senegalia mellifera* is the most dominant shrub in the study unit, but *Rhigozum trichotomum* is also common with *Stipagrostis sp.* the most dominant grass. Other more sparsely scattered shrubs include *Phaeoptilum spinosum, Ziziphus mucronata, Zygophyllum rigidum, Crotalaria cf. spartioides* and *Aptosimum marlothii.* The habitat provides the optimal foraging habitat for Kori Bustard, known to be present in the area, as well as providing the preferred habitat for other threatened and near threatened avifauna species such as Ludwig's Bustard. As a result of the unique environment a number of habitat specific species such as Anteating Chat (*Myrmecocichla formicivora*), Fawn-coloured Lark (*Calendulauda africaniodes*), Karoo Shrub-robin (*Erythropygia coryphaeus*) and Black-faced Waxbill (*Estrilda erythronotos*) occurs. Connectivity of the habitat unit with surrounding homogenous habitats is relatively good throughout the study area. On account of the aforementioned function of connectivity, the optimal habitat for threatened bird species, natural state of the habitat and unique species composition, the largest part of this habitat was deemed to be **moderately sensitive** from an avifaunal perspective. **Please Note;** The study

unit does not include the riparian zone of the Vaal river since the proposed agricultural development will not form part of this riparian zone.

Figure 25: *Senegalia mellifera* dominated Alluvial Vegetation

Agricultural Land

A small part in the north-east of the study area consists of this habitat type. A large number of bird species have adapted to this transformed habitat. This habitat is largely transformed due to agricultural activities and contains cultivated land. Species associated and adapted to this environment includes; Korhaan, Francolins, Spurfowl, Guineafowl, Ostrich, Cattle Egrets, Ibis, Storks, Pigeons, Chats and Starlings. Although this habitat might occasionally be utilized for foraging purposes by threatened and near threatened species such as Secretarybird, Kori Bustard and Ludwig's Bustard, no suitable breeding habitat for any threatened or near threatened avifaunal species were observed, and as such the area cannot be deemed sensitive solely on account of the sporadic and occasional presence of these IUCN Red listed bird species. As a result of the lack of suitable breeding habitat for threatened and near threatened avifauna as well as the numerous disturbances associated with agricultural activities this habitat type was deemed to have a reasonably **low avifaunal sensitivity**.

Table 13: Red data bird species to be present in the 2824CC QDS

No.	Species Name	Last Recorded Year	Red Data: (Regional; Global)	Taxonomic Name	SABAP2 Rep Rate (%)	HR	BR
1	Bustard, Kori	2011	NT, NT	*Ardeotis kori*	50	4	4

2	Bustard, Ludwig's	Not recorded	**EN, EN**	*Neotis ludwigii*	0	3	3
3	Eagle, Martial	2017	**EN, VU**	*Polemaetus bellicosus*	50	5	4
4	Eagle, Tawny	Prior to 2017	**EN, LC**	*Aquila rapax*	0 (8.33 during SABAP1)	2	0
5	Falcon, Lanner	2011	**VU, LC**	*Falco biarmicus*	50	4	2
6	Sandpiper, curlew	Prior to 2017	**LC, NT**	*Calidris ferruginea*	0 (8.33 during SABAP1)	2	0
7	Secretarybird,	Not recorded	**VU, VU**	*Sagittarius serpentarius*	Single incidental observation	3	3
8	Stork, Abdim's	2010	**NT, NT**	*Ciconia abdimii*	0	2	0
9	Vulture, White-backed	2017	**CR, CR**	*Gyps africanus*	100	5	5

Red data species Categories for the Birds of Southern Africa (Birdlife South Africa 2015)
LC = Least Concern, **NT** = Near Threatened, **VU** = Vulnerable, **EN** = Endangered, **CR** = Critically Endangered.
Very Low – 1, Low – 2, Medium – 3, High – 4, Recorded on site – 5, Not likely to occur/breed – 0,
Threatened or near threatened Species

(For a list of all potential Avifaunal Species, please see appendix E1)

A total of nine threatened and/or near threatened bird species have been recorded within and around the 2824CC QDS. Four of these have not yet been recorded within the 2855_2405 pentad since the commencement of the South African Bird Atlas Project 2 in 2007. With the exception of Abdim's Stork and Tawny Eagle, the remaining species are likely to occur since the study area provides suitable foraging and/or breeding habitat for these species. Two of the abovementioned species, namely Martial Eagle and White-backed Vulture, were confirmed during the field survey in September 2017. In addition, 46 individual White-backed Vultures and six active nests were recorded within the study area. It is reasonable to except that there are more nests within the study area.

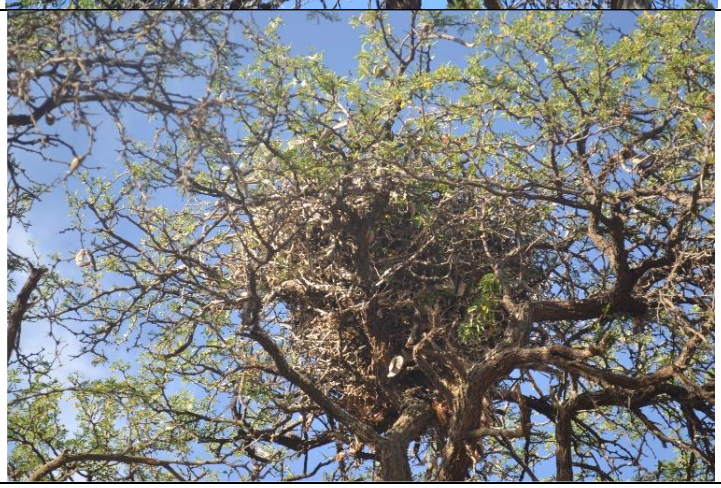
7.1.7.5 White-backed Vulture nest sites - preliminary results.

The *Vachellia erioloba* dominated Savanna habitat unit provides suitable breeding habitat for the internationally critically endangered White-backed Vulture (*Gyps africanus*). Six active nest sites (Table 14) were confirmed within the study area during the field survey. As a result of this observation a detailed habitat assessment was conducted with the aim to map suitable breeding and foraging habitat for this species on and adjacent to the study area to determine the number of White-backed Vulture pairs that could potentially be utilising the study area for breeding purposes. Initially, optimal breeding habitat for White-backed Vultures was identified and mapped accordingly. The study area was then thoroughly surveyed to identify active nests sites; however, vulture nests can easily be overlooked due to the fact that canopies of *A. erioloba* nest trees are often significantly convex and vultures do not always nest at the apex of the tree. This in conjunction with

the dens leave cover of the trees makes it difficult to state with confidence that all active nests on the study area was in fact recorded during the survey. A 1.5km buffer area was then applied to each nests site (*pers. comm*., Mr. M. Andeson, CEO BirdLife South Africa). Due to the fact that five of the six nests identified within the study area were within 100-200m of each other, this cluster of nests can be considered as a small colony and was given a 2km buffer. Wilbur and Jackson (1983) state that there is considerable variability in the sensitivity of vulture species to disturbance. Southern African vultures are generally considered to be more sensitive to disturbance from people than some species in West Africa and Asia (Mundy, et al, 1992). This particularly applies to the breeding sites of these birds. Boshoff, Anderson & Borello (1997) recommend that disturbance in the vicinity of nesting sites of southern African Vultures should be prevented completely.

Table 14: White-backed Vulture Active Nests

Nest No.	Coordinates	Photo
1	-28.980605°, 24.097945°	
2	-28.979609°, 24.094973°	

3	-28.978044°, 24.095667°	
4	-28.978404°, 24.098886°	
5	-28.977449°, 24.099292°	

6	-28.970806°, 24.101500°		

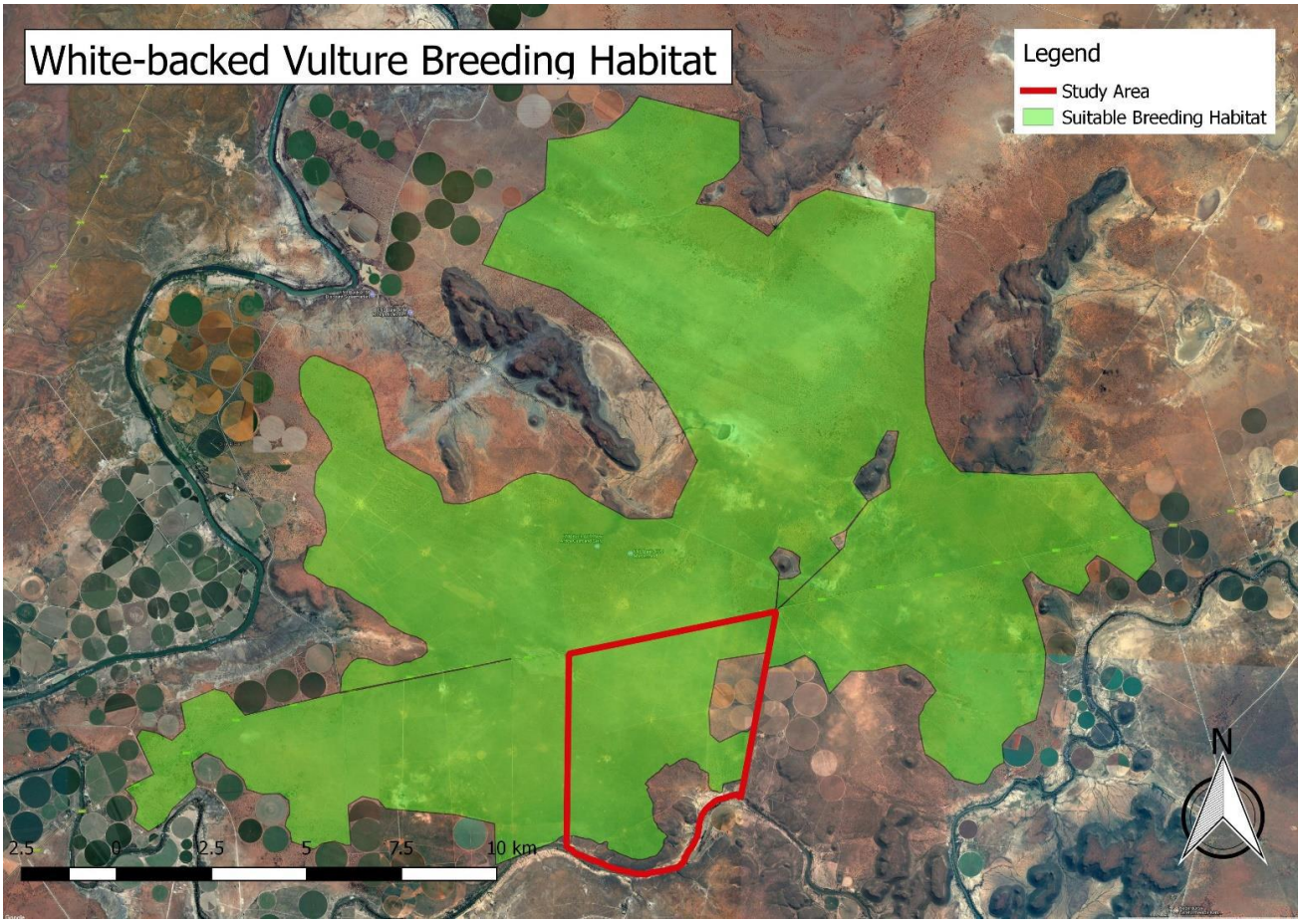


Figure 26: Suitable White-backed Vulture (*Gyps africanus*) habitat

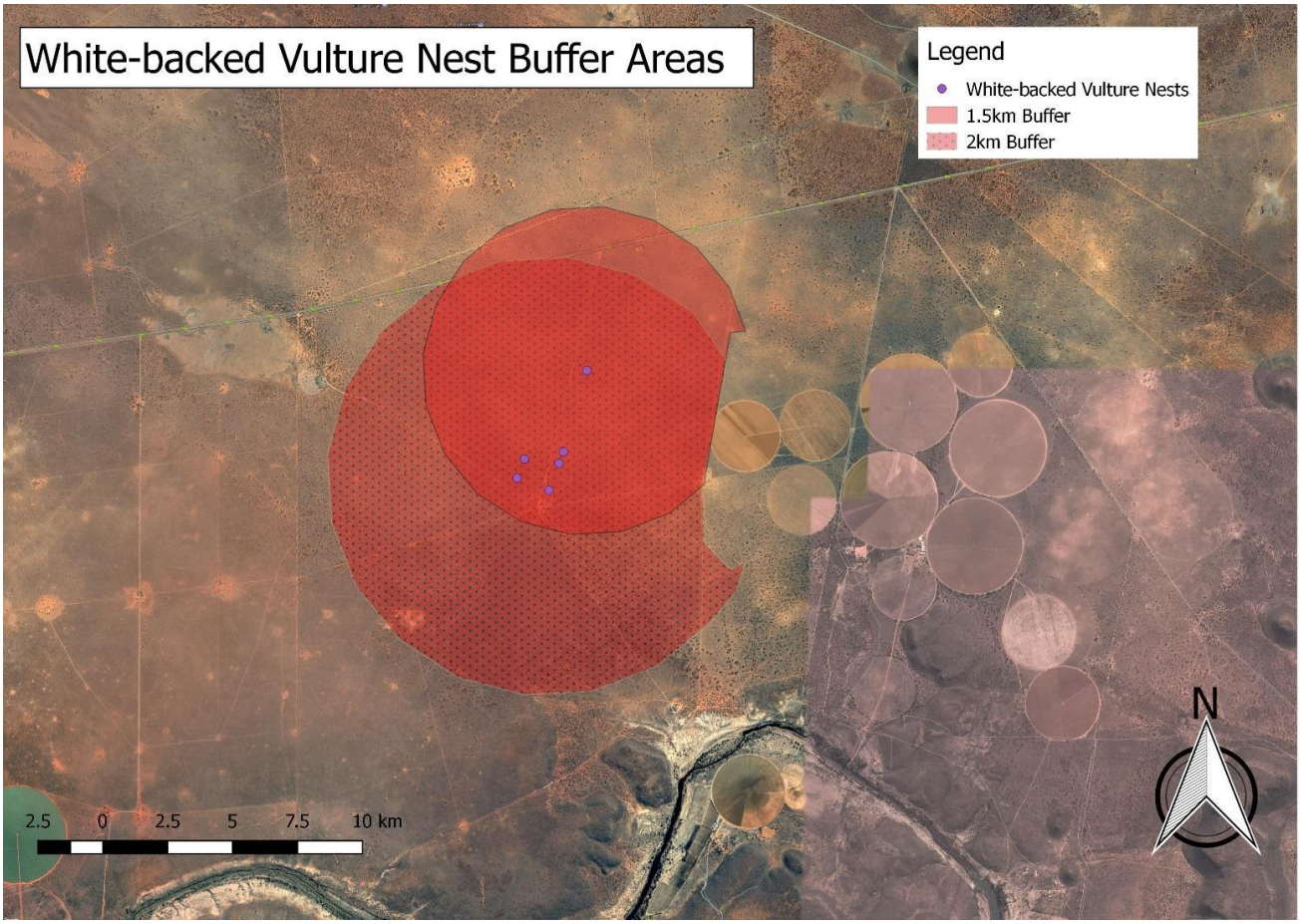


Figure 27: White Black Vulture Nest Buffer Areas

African White-backed Vulture (*Gyps africanus*) habitat survey	
Identified Area	**Surface Area (hectares)**
Suitable breeding habitat (including habitat surrounding the study area)	20 958 ha
Suitable breeding habitat (within the study area)	2 057ha

Nest densities range from 0.32/km2 to 0.61/km2 across colonies, with an average density of 0.46/km2. The nest density of the confirmed nests on the study area is approximately 0.29/km2. On account of the aforementioned it is highly probable that the study area actually holds more active nests than the number of confirmed nests. Therefore, the entire *Vachellia erioloba* dominated Savanna habitat unit can be seen as being **highly sensitive** from an avifaunal perspective.

7.1.7.6 Limitations and Assumptions

The majority of the data used to conclude the distribution of Red Data species were sourced by making use of the SABAP 1 and 2 data bases. Any limitations in the above-mentioned studies will in effect have implications on the findings and conclusion of this assessment. Furthermore, this avifaunal assessment was conducted

during September; hence the survey was done outside the main breeding period of the most of the local bird species. Moreover, most of the Palearctic and intra-Africa migratory bird species have not yet arrived from their boreal and equatorial summer breeding habitat. With respect to this assessment the implications of not being able to record migratory bird species will be minimal, seeing that threatened or near threatened Palearctic species face threats on their boreal breeding habitat.

Limited time to conduct the survey could potentially result in not recording all species within the study area. The study site was visited on the 27th of September 2017. In total, nine and a half hours were spent on site while conducting this avifaunal assessment. As a result of the size of the study area, 9 hours was deemed sufficient time to record all the prevalent bird species on and around the study area. However, more time is needed to conclusively map active White-backed Vulture nests as well as confirming the occurrence of species not confirmed during the field survey. Due to the abovementioned the focus of the survey was to (1) provide an indication of the occurrence of species of conservation concern and their habitats and (2) to provide an indication on the general species richness". Also, no quantifiable information was collected and therefore the dominance, relative densities, local compositions and functional groups were not analysed. As such, the results provide a "snapshot" of the bird richness and occurrence probability of birds with conservation concerns in the area and was based on a single instantaneous sampling.

7.1.7.7 Findings

The discrete habitats identified within the study area support a variety of bird species, with approximately 155 with a high to medium occurrence probability, of which six threatened and/or near threatened avifaunal species are likely to recur and/or be resident. The following findings were made for each of the associated habitat units within the larger study area.

- **Agricultural:** As a result of the lack of suitable breeding habitat for threatened/near threatened avifauna, as well as the numerous disturbances associated with agricultural activities, this habitat unit was deemed to have a low avifaunal sensitivity.
- ***Senegalia mellifera dominated Alluvial Vegetation***: No suitable breeding habitat for threatened/near threatened bird species were observed on site, although the habitat might be suitable in terms of foraging and hunting for certain threatened and near threatened species such as Lanner Falcons, Kori Bustard and Ludwig's Bustard. On account of the near natural state of this habitat unit together with the overall high avifaunal species composition, this study unit was deemed moderately sensitive from an avifaunal perspective.
- ***Vachellia erioloba dominated Savanna***: On account of this habitat unit's connectivity function, the optimal habitat for threatened and near threatened bird species, the natural state of the habitat and

unique species composition, it was deemed to be highly sensitive from an avifaunal perspective. Furthermore, six active White-backed Vulture nests were recorded within the habitat unit, with a high probability that more nests could be present. This augments the sensitivity of this habitat unit.

7.1.7.8 Recommendations

- It is highly recommended that a follow-up survey be conducted, spanning more than 24 hours of sampling, to quantify the White-backed Vulture (*Gyps africanus*) breeding population on the study site as well as on neighbouring farms (farms that border the study site). The aim is to provide an indication of the number of active nests on the site (and on neighbouring farms) as well as their distribution on the site (and on neighbouring farms) and to assess the proportion the South African population that utilize the area for breeding and roosting purposes. The survey should coincide with the onset of the breeding season (c. May-July) and should follow the protocol as explained by Malan and Howells (2009) and Monadjem and van Zyl (2009).
- Given the Critically Endangered status of this species the actual number of nests is important. It should be mandatory to count all the Vulture nests during the breeding season according to accepted protocol. A follow-up site visit should mandatory not only to map out the nest, but also to determine the nesting success prior to the development (including a management plan in consultation with NC department).
- Should any agricultural development occur within the study area, such developments should be restricted the areas deemed to have a low to medium avifaunal sensitivity.
- No development should take place on areas of high avifaunal sensitivity.
- No Camel Thorn trees (*A. erioloba*) should be removed or harmed in any way, since they provide nesting platforms for White-back Vultures.
- No development should be permitted within a 1.5km radius of any single White-backed Vulture nest nor should any development occur within a 2km radius of the small nesting White-backed Vulture colony. The aforementioned buffer zones should be respected.

7.1.7.9 Conclusion

The study area contains a total of three distinct habitats of which the Agricultural habitat unit was deemed to have a low avifaunal sensitivity. The *Vachellia erioloba* dominated Savanna habitat unit was deemed to be highly sensitive on account of various factors as discussed, but mainly due to a number of active White-backed Vulture nest within this habitat unit. Development within the habitat unit deemed to have a high avifaunal sensitivity should be restricted.

At least nine threatened and/or near threatened bird species are thought to sporadically visit and/or reside within the study area, of which six species are judged to have a medium to high probability of breading and/or being resident within the study area. These species are highly specialized and restricted to their associated habitats as stipulated in this report. Therefore, care should be taken to preserve these unique habitats by restricting disturbances and minimizing transformation in these areas.

Special attention should be assigned to ensure that connectivity of homogeneous habitats stays intact as connectivity of the various habitat units within surrounding homogenous habitats is mandatory to ensure sustainable demographic patterns of avifaunal species relying on certain habitats for survival.

7.1.8 Ecological Offset Report Findings

It is recommended that Alternative 2 for the Remaining Extent of the Farm Zulani no 167 be considered for the proposed developments. This alternative mainly fall outside the Critical Biodiversity Area two (CBA 2) area and have relatively small direct impacts. In the case of this Alternative 2 the proposed development is unlikely to lead to direct and permanent destruction of irreplaceable or near-irreplaceable biodiversity as no critically endangered bird individuals will be killed, in which case it would have constituted a fatal flaw. The proposed development will however lead to some loss of CBA 2 area, significant loss of protected tree species as well as the permanent destruction of significant nesting habitat (although not necessarily unique) and subsequent displacement of a number of critically endangered birds. These residual negative impacts need to be remedied in order to satisfy the NEMA principles.

(Please see full Ecological Offset report attached as Appendix E5)

7.2 SOCIO-ECONOMIC DESCRIPTION

The proposed project does not hold any overriding negative social impacts to suggest a no development option. The investment, employment and income generation potential linked to the project will positively contribute to the socio-economic development objectives described in the local IDP.

The Department of Economic Development and Tourism in the Northern Cape has recently concluded the development of its Provincial Local Economic Development (LED) Strategy in line with the Northern Cape Growth and Development Strategy. The LED is an approach to sustainable economic development that encourages residents of local communities to work together to stimulate local economic activity that will result in, inter alia, an improvement in the quality of life for all in the local community. These Strategies provide the foundation for Integrated Economic Development Planning throughout the Northern Cape. A development such as the proposed project would present a definite benefit and addition to the LED through local job creation and skills development and contribute to the alleviation of poverty and unemployment in the local municipality. This will enable a better livelihood and a higher quality of life to individuals involved.

The following section will provide a brief insight as to the socio-economic conditions in the respective municipal areas:

Siyancuma local Municipality:

Employment:

There are 11 064 (out of 37 076) people that are economically active (employed or unemployed but looking for work), and of these,28,2% are unemployed.

Of the 5 800 economically active youth (15–34 years) in the area, 35,2% are unemployed.

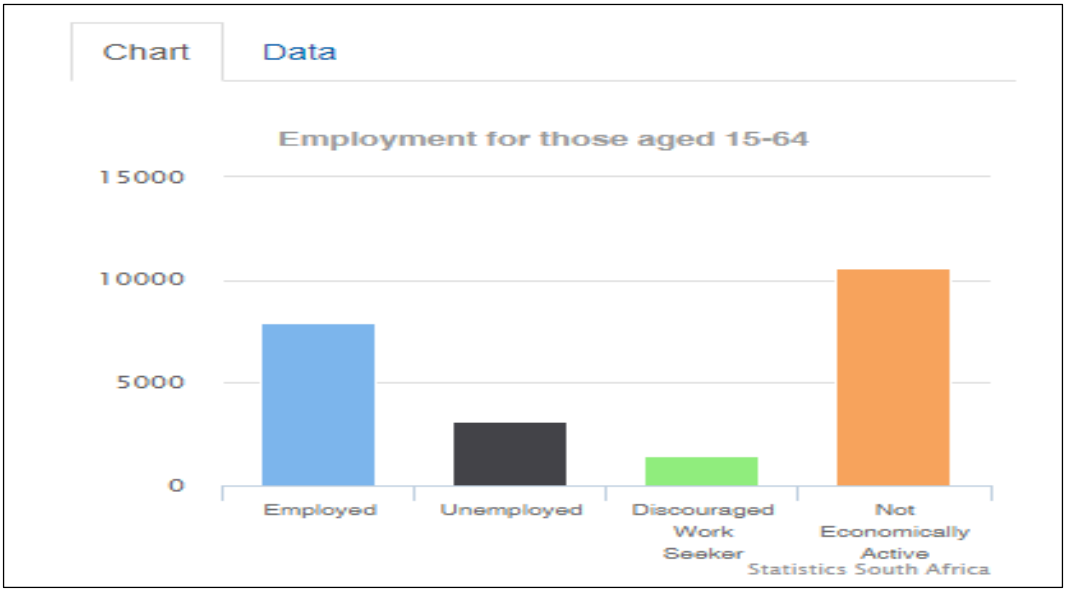


Figure 28: Employment Graph for those aged 15-64

Economic profile:

The Economic Profile of the Siyancuma Local Municipality is summarized below. It is clear that the fourth highest percentage of people have no income. This project will contribute by providing new working opportunities during the construction/preparations phase and operational phases.

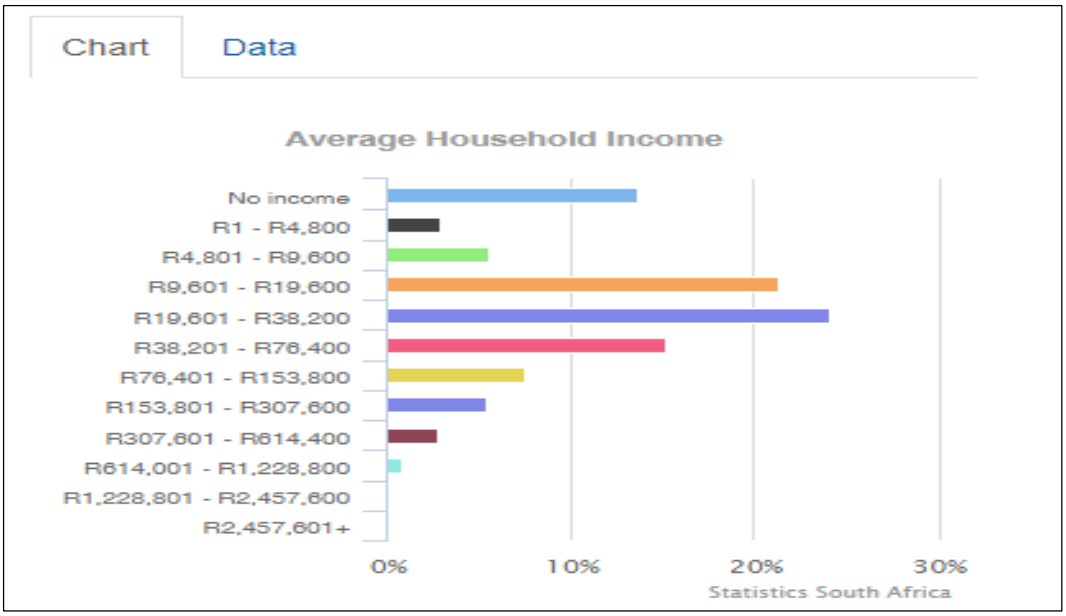


Figure 29: Economic profile graph indicating household income

Level of Education:

According to the Census, Siyancuma Local Municipality has a total population of 37 076 people. The majority of the population in the municipality are coloured at 57,5%,33,3% are black African,7,5% are White, 0,7% are Indian/Asian, with the other population groups making up the remaining 1,4%.

Of those aged 20 years and older,7,2% have completed primary school, 30,3% have some secondary education, 16,9% have completed matric and 5,4%have some form of higher education. Of the mentioned age group, 16,8% have no form of schooling.

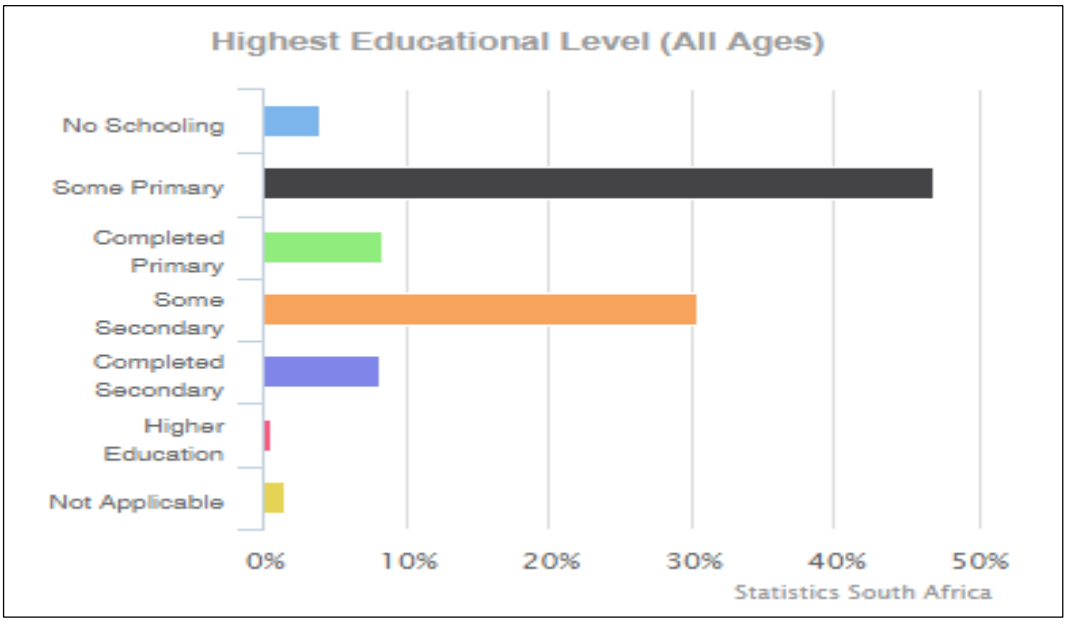


Figure 30: Education graph indicating education levels

Construction and operational phase job creation (local employment) and sustainable capacity building (skills, experience and resources development) of this project will aid in immediate and continuous local community upliftment and poverty alleviation and are therefore regarded as significant socio-economic benefits associated with the proposed project to motivate the need and desirability.

8. PUBLIC PARTICIPATION PROCESS

A continual and comprehensive Public Participation Process (PPP) was undertaken throughout the entire Scoping & EIA process with all stakeholders and Interested and Affected Parties (I & AP's), including the relevant organs of state and competent authority (Northern Cape Department of Environment and Nature Conservation) as identified during the Scoping Phase.

The PPP was conducted in accordance with the requirements of Regulation 41 of the EIA Regulations, 2017 and the designated Public Participation Officer will ensure that the PPP is facilitated in a manner which ensures reasonable opportunity for all stakeholders and registered I & AP's to comment and provide input on the proposed project.

8.1 SCOPING PHASE PUBLIC PARTICIPATION

The PPP for the Scoping Report commenced on 29 November 2017 and concluded on 19 January 2018 (excluding the period between 15 December and 5 January). The following means were used to notify the public of the commencement of the process:

- Email notifications were sent to all identified stakeholders, relevant Organs of State and competent authority on 29 November 2017.
- An advertisement was placed in the local newspaper (Northern Cape Express) on 29 November 2017 to inform potential I & AP's and invite them to register for the proposed project.
- Written notices were placed at the Siyancuma local Municipality in Douglas, public library and post office on 29 November 2017.
- Site notices were placed at the main entrance of the Remainder of the farm Zulani No. 167 as well as at certain portion along the R 357 on 29 November 2017.
- Hardcopies of the Scoping Report were made available at the Siyancuma local Municipality in Douglas and the public library for public viewing on 29 November 2017.
- A hardcopy of the Scoping Report was made available at the Idstone Farming office for public viewing on 29 November 2017.
- A hardcopy was hand delivered at the offices of the competent authority on 29 November 2017.

All stakeholders and I & AP's was adequately notified of the Public Participation Processes taking place as well as the availability of the relevant documents for comment as per Regulation 41 of the EIA Regulations, 2017.

An I & AP's register containing the names and contact details of all relevant stakeholders and I & AP's was established and is submitted to the competent authority along with this Final Scoping Report as per Regulation 42 of the EIA Regulations, 2017 (see Appendix C).

All proof of notifications, I & AP registrations as well as comments received and responses provided during the PPP were incorporated into a Public Participation Report which is available in Appendix C.

The Scoping Report was approved/ accepted by the competent authority on 23 March 2018.

8.1.1 Comments received and responses provided during the Scoping phase

All comments received from the stakeholders and I & AP's during the Scoping phase together with the subsequent responses provided were incorporated into the initial Public Participation Report which was submitted to the competent authority along with the Final Scoping Report.

See table below providing the summary of all comments and responses during the Scoping phase:

Table 15: Comments Received during the 30-day Scoping Phase Public Participation period

Comments Received during the Scoping 30 Day PPP				
Number	**Organisation**	**Name**	**Tel/Cell**	**Email**
1.	South African Heritage Recourses Agency (SAHRA)	Me. Natasha Higgitt	021 462 4502	nhiggitt@sahra.org.za
Comments Received:	SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit requests that the Scoping Report appendices, the draft EIA and all appendices must be submitted to the case application on SAHRIS so that an informed comment can be issued. Further comments will be issued upon receipt of the above. Should you have any further queries, please contact the designated official using the case number quoted			
Response from EAP:	Good day Natasha Hope all is well? Thank you very much for the email. Comments received. As per our telephonic discussion, your comments require the Draft Impact Assessment report also to be submitted in order for you to provide an informed decision / comment on the projects. Due to this being the scoping phase, we will first await approval on the Scoping phase before compiling the Draft Impact Assessment report. Once complete, all relevant and required documentation will be forwarded to you as per your request. If we receive negative feedback / rejection on the scoping report, this will also be forwarded to your offices.			

	Please let me know if the above will suffice. Kind regards
Feedback received based on EAP response	Good morning, Thank you for updating SAHRA on the development applications. We await further documentation regarding the project with regards to the approval/rejection of the Scoping Report, and if approved, the Draft EIA and appendices. Kind Regards

Number	Organisation	Name	Tel/Cell	Email
2.	Northern Cape Department of Water and Sanitation	Me. Refilwe Damane	053 836 2233	damaner@dws.gov.za

Comments Received:

The Department of Water and Sanitation acknowledges receipt of a draft scoping report for the proposed project. The document we then reviewed with reference to the National Water Act (Act No. 36 of 1998) and the following are the comments.

- ***Distance from Watercourses:***

The department rates all perennial and non-perennial rivers together with all dry river beds and natural drainage and associated riparian areas extremely sensitive to development. An option of developing furthest away from all watercourses would be the prefer option.

No development should be done within 100 m or 1:100-year flood line of any water course and 500m of wetlands without authorisation from the Department. The Watercourse should be delineated in order to provide appropriate buffer to maintain such water course. The delineation should be don according to the appropriate Department of Water and Sanitation delineation document.

The construction camp shall not be located within the 1:100-year flood line or within a horizontal distance of 100m from any watercourse. Operation and storage of equipment within the riparian zone must be limited as far as possible.

Vehicles and other machinery must be services well above the 1:100-year flood line or within a horizontal distance of 100m from any watercourse. Oils and other potential pollutants must be disposed of at an appropriate licensed site with the necessary agreement from the owner of such site.

- ***Storm Water Management:***

Any storm water must be diverted from the construction works and roads and must be managed in such a manner as to disperse runoff and to prevent the concentration of storm water flow. Where necessary, works must be constructed to attenuate the velocity of storm

	water discharge and to protect the banks of the watercourse. Storm water control must be constructed, operated and maintained in a suitable manner through the project. Increase runoff due to vegetation clearance and/or soil compaction must be manage, and steps must be taken to ensure that storm water does not lead to bank instability and excessive levels of silt entering the watercourse. Strom water leaving the construction site must in no way be contaminated by any substance, whether such substance is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped, or spilled on the premises. • ***Invasive Alien Vegetation:*** Alien invasive species that were identified within the study area and in specific along the final route alignment should be removed prior to construction-related soil disturbances. By removing these species, the spread of seed will be prevented into disturbed soils. All alien seedlings and samplings must be removed as they become evident for the duration of the construction. All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on the construction areas. This should be verified by the ECO. • ***Design and Layout alternatives:*** A detailed layout plan needs to be submitted to our Department showing all facilities in the proposed development, distances from any watercourses and bathroom facilities. Details of the final design must also be supplied as soon as s decision has been made, as the details of this factor will influence the environmental impact both during the construction and operational phases of the project. • ***Construction:*** Details of the actual construction method must be stated as soon as possible, as this may significantly impact on the type and quantity of the construction waste and impacts on the water resources. Material with pollution generating potential must be limited in any construction activities. Any hazardous substances must be handled according to the relevant legislation relating to transport, storage, and use of the substance. Any spillages of any hazardous material including diesel that may occur during construction and operation must be reported immediately to our department. Please be informed that construction water may not be obtained from any water resource without the necessary authorisation. The Department noted the intention the department notes the intention to source water form local municipalities. Please provide proof of such an agreement to the Department prior to commencement. • ***Waste Management:***

Rubbish bins and Enviro loo/mobile toilets must be there and enough for the people on site during construction. A letter of consent from a registered waste facility to allow contractor to empty the toilet at their sewer system should be submitted to our department.

All sewage, grey and wash water, as well as any waste generated during the construction phase of the facilities will be collected, contained and disposed of at the permitted and / or licensed facilities of the Local Authority and this must please be confirmed in writing by the local authority.

- ***Rehabilitation:***

Soils that have become compacted through the activities of the development must be loosened to an appropriate depth to allow seed germination. The necessary erosion prevention mechanisms must be employed to ensure the sustainability of all structures and activities and to prevent in-stream sedimentation.

- ***Water Use Entitlement:***

Please take note that authorisation (in terms of Section 21 of the NWA) from the Department of will be required prior to commencement of the project should the following water uses be triggered by the proposed activity.

Water Use	Example
a) Taking water from a water resource	Abstracting water from a river or borehole for the following purposes.
c) Impeding or diverting the flow of water in a watercourse.	Construction of structures/facilities within a water course (perennial and non-perennial). This means that no development should be done within 100 m or 1:100 year flood line of any water course and 500m of wetlands.
i) Altering the bed, banks, courses or characteristics of a watercourse.	Construction of structures/facilities within a water course (perennial and non-perennial). This means that no development should be done within 100 m or 1:100 year flood line of any water course and 500m of wetlands.

In addition, a site inspection should be conducted prior to commencement of the activity by a departmental official to verify all water uses that might be triggered by the activity.

- ***Conclusion:***

Should the above issues be considered and all the requested documentation be submitted, the Department of Water and Sanitation has no objections to the proposed development.

Response from EAP:	Eco-Con Environmental acknowledge receipt of your comments/letter date 10 January 2018. Eco-Con Environmental reviewed/read through the comments received and below follows our response: • ***Distance from Watercourses:*** Your comments have been reviewed and Eco-Con Environmental will include these comments/conditions within the Environmental Management Plan to be submitted with the Draft Impact Assessment report once approval has been obtained for the Scoping report. • ***Storm Water Management:*** Your comments have been reviewed and Eco-Con Environmental will include these comments/conditions within the Environmental Management Plan to be submitted with the Draft Impact Assessment report once approval has been obtained for the Scoping report. • ***Invasive Alien Vegetation:*** Your comments have been reviewed and Eco-Con Environmental will include these comments/conditions within the Environmental Management Plan to be submitted with the Draft Impact Assessment report once approval has been obtained for the Scoping report. • ***Design and Layout alternatives:*** The final designs and layout out alternatives will be submitted to your office during the Public Participation period on the Draft Impact Assessment report. • ***Construction:*** Full details regarding the construction process have been provided under section 5.2.1 and 5.2.2 of the scoping report. This will again be included in the Draft Impact Assessment report which will be submitted to your office during the Public participation period on the Draft Impact Assessment report. Further to the above. Your comments have been reviewed and Eco-Con Environmental will include these comments/conditions within the Environmental Management Plan to be submitted with the Draft Impact Assessment report once approval has been obtained for the Scoping report. • ***Waste Management:*** Your comments have been reviewed and Eco-Con Environmental will include these comments/conditions within the Environmental Management Plan to be submitted with the Draft Impact Assessment report once approval has been obtained for the Scoping report. • ***Rehabilitation:***

	Your comments have been reviewed and Eco-Con Environmental will include these comments/conditions within the Environmental Management Plan to be submitted with the Draft Impact Assessment report once approval has been obtained for the Scoping report. • ***Water Use Entitlement:*** Eco-Con Environmental was also appointed to assist the client with the Water Use License Applications. This application will be submitted to the Department once all documentation, including the Environmental Authorisation and Ploughing Certificate, have been obtained. • ***Conclusion:*** Thank you very much for providing your comments to Eco-Con Environmental. Eco-Con environmental will ensure that all these comments have been address during the different stages of the project.

Number	Organisation	Name	Tel/Cell	Email
3.	SANParks	Mr. Lucius Moolman – Reginal Manager - Arid Region	012 426 5000	lucius.moolman@sanparks.org

Comments Received:

To develop, expand, manage and promote a system of sustainable national parks that represent biodiversity and heritage assets, through innovation and best practice for the just and equitable benefit of current and future generations

South African NATIONAL PARKS

MONP/16/3/1

7 June 2018

Mr Johan Botes
ECO-CON
Po Box 29262
Dan Hof
Bloemfontein
9310

COMMENTS ON THE ENVIRONMENTAL APPLICATIONS FOR THE PROPOSED CULTIVATION AND THE ESTABLISHMENT OF POTATO FARMING ON THE PROPORTIES- LORRAINE 100, BANKS DRIFTS NO 164 AND PORTION 1 OF CHRISTIAANS DRIFT NO 166 (ALL TOGETHER) AS WELL AS FARM ZULANI NO 167 IN THE DOUGLAS AREA

Following the review of the Scoping Reports for the said properties as well as a preliminary consultation process towards possible offsets held on the 21 May 2018 SANParks would like to comments on the proposed developments as follows;

For the properties Banks Drift no 164 together with portion 1 of Christians Drift no 166, as well as Farm Zulani no 167, SANParks is of the opinion that these developments do not fall within the footprint of Mokala National Park. SANParks will however support the outcome from DENC with regard to these two proposed developments.

Farm Lorraine no 100 is however falling within the footprint of Mokala National Park and concerns are raised which will therefore have a detrimental impact on the protected area if this development is authorized to go ahead.
These concerns are;

1. It should be acknowledged that the proposed development (alternatives 1 and 2) on farm Lorraine no 100 falls within a Critical Biodiversity Area and within close proximity to the north western boundary of Mokala National Park, a declared protected area.
2. The proposed development on farm Lorraine no 100 also falls within the developing footprint of Mokala National Park and will have a detrimental effect on future expansion of Mokala National Park.
3. The presence of a rare and endangered vulture colony (white backed vultures) on the farm Lorraine no 100 is a serious concern as a national decline in numbers is observed. The area is also frequently visited by Cape Vultures. It should be noted that it is not only the breeding but also the habitat that will negatively impacted upon.
4. Two protected tree species occur on the farm Lorraine no 100 namely Boscia albitrunca (Shepherds Tree) and Vachellia erioloba (Camel Thorn). The Vachellia erioloba plant community is also threatened by development.

addo elephant
agulhas
augrabies
bontebok
camdeboo
golden gate highlan
karoo
kgalagadi transfror
kaysna lake area
kruger
mapungubwe
marakele
mokala
mountain zebra
namaqua
table mountain
tankwa karoo
tsitsikamma
richtersveld
west coast
wilderness

South African NATIONAL PARKS

To acquire and manage a system of national parks which represents the indigenous wildlife, vegetation, landscapes and significant cultural assets of South Africa for the pride and benefit of the nation.

addo elephant
agulhas
augrabies
bontebok
cape peninsula
golden gate highlands
karoo
kgalagadi transfrontier
knysna lake area
kruger
marakele
mountain zebra

5. The proposed development will also have a negative impact on the soil structure as a result of ploughing, fertilizing and use of chemicals for weed control. Irrigation may also result in higher than normal leaching of nutrients out of the soil which may change the chemical composition of the soil which will lead to soil degradation.

6. The clearing of vegetation and occurrences of heavy rain and thunderstorms will result in higher soil loss which will in return impact negatively on the water quality delivered from the catchment to the Riet River.

Due to the concerns raised above, SANParks will not support the development as proposed on farm Lorraine no 100.

Yours truly

.....
Lucius Moolman
Regional General Manager – Arid Region
South African National Parks

12/6/2018
Date

Response from EAP:

ECO-CON ENVIRONMENTAL
BECAUSE A GOOD PLANET IS HARD TO FIND

South African National Parks (SANParks)
P.O. Box 787
Pretoria
0001

(T) 021 426 5000
(F) 012 343 0905

28 June 2018

To: Mr. Lucius Moolman (Regional Manager – Arid Region)

RE: FEEDBACK ON COMMENTS ON THE ENVIRONMENTAL APPLICATIONS FOR THE PROPOSED CULTIVATION AND THE ESTABLISHMENT OF POTATO FARMING ON THE PROPERTIES – LORRAINE100, BANKS DRIFT 164, AND PORTION 1 OF THE FARM CHRITIAANS DRIFT 166 AS WELL AS FARM ZULANI 167 IN THE DOUGLAS AREA

Eco-Con Environmental acknowledge receipt of your comments/letter date 12 June 2018. Eco-Con Environmental reviewed/read through the comments received and below follows our response:

Paragraph 2 of your letter date 12 June 2018 states: *"For the properties Banks Drift no 164 together with portion 1 of Christiaans Drift no 166, as well as Farm Zulani no 167, SAMParks is of the opinion that these developments do not fall within the footprint of Mokala National Park. SANParks will however support the outcome from DENC with regard to these tow proposed developments."*

Eco-Con Environmental thank you for your feedback to the above mentioned two developments. This will be communicated to DENC.

Paragraph 3, together with the concerns numbered 1 to 6, of your letter date 12 June 2018 states: *"Farm Lorraine no 100 is however falling within the footprint of Mokala National Park and concerns are raised which will therefore have a detrimental impact on the protected area if this development is authorised to go ahead. These concerns are:*

1. *It should be acknowledged that the proposed development (alternatives 1 and 2) on farm Lorraine no 100 falls within a Critical Biodiversity Area and within close proximity to the north western boundary of Mokala National Park, a declared protected area.*
2. *The proposed development on the farm Lorraine no 100 also falls within the development footprint of Mokala National Park and will have a detrimental effect on future expansion of Mokala National Park.*
3. *The presence of a rare and endangered vulture colony (white backed vultures) on the farm Lorraine no 100 is a serious concern as a national decline in numbers is observed. The area is also frequently visited by Cape Vultures. It should be noted that it is not only the breeding but also the habitat that will be negatively be impacted upon.*

4. *Two protected tree species occur on the farm Lorraine no 100 namely Boscia Albitranca (Shepherds Tree) and Vachellia erioloba (Camel Thorn). The Vachellia erioloba plant community is also threatened by development.*
5. *The proposed development will also have a negative impact on the soil structure as a result of ploughing, fertilizing and use of chemicals for weed control. Irrigation may also result in higher than normal leaching of nutrients out of the soil which may change the chemical composition of the soil which will lead to soil degradation.*
6. *The clearance of vegetation occurrences of heavy rain and thunderstorms will result in higher soil loss which will in return impact negatively on the water quality delivered from the catchment to the Riet River*

Due to the concerns raised above, SANParks will not support the development as proposed on farm Lorraine 100."

Based on your comments above, regarding the farm Lorraine no 100, Eco-Con Environmental is pleased to announce that as a result of the significantly high sensitivity of the farm Lorraine no 100, the client, in collaboration with the Independent EAP and Ecological Specialist, have decided to withdraw the farm Lorraine no 100 from the application to develop. In other word, development will not proceed on the farm Lorraine no 100. Lorriane no 100 will in return form part of the Biodiversity Offset report for the other two projects on the farm Zulani 167 and the farms Banks Drift 164 and Portion 1 of the Farm Christiaan Drift no. 166.

Eco-Con Environmental thank you for your inputs and cooperation in this regard.

Please feel free to contact the EAP if any of the above is unclear.

Kind Regards

Johan Botes
082 459 8206
johan@eco-con.co.za

Number	Organisation	Name	Tel/Cell	Email
4.	Birdlife South Africa	Mr. Jonathan Booth	011 789 1122	jonathan.booth@birdlife.org.za

Comments Received:

Hi Rikus and Johan,

Apologies for the late reply, last week ran away with me a bit.

I've gone through all the documentation, and BirdLife South Africa would oppose the development unfortunately. As an organisation, we clearly appreciate the need for development in South Africa and, where possible, work with developers to ensure that impacts of development are properly mitigated so that development can proceed. However in this case we feel that it would not be possible to mitigate the impacts.

We discussed the possible use of a biodiversity offset. Offset's should only be used in accordance with the Mitigation Hierarchy, and this will be confirmed by the soon to be published National Biodiversity Offset Policy. The IFC Performance Standard 6 also requires the use of the Mitigation Hierarchy – see attached; the section titled Protection and Conservation of Biodiversity (especially points 16 – 18) are relevant. The IFC (International Finance Corporation) is the funding arm of the World Bank, and all banks that borrow from the World Bank (almost all SA banks) and those that have signed the Equator Principles (the four big SA banks have signed and comply with the Equator Principles) must comply with the IFC Performance Standard 6.

As White-backed Vultures are Critically Endangered (http://www.iucnredlist.org/details/22695189/0), sections 16 – 18 of the IFC Performance Standard 6 are applicable, as copied in at the end of this email. The proposed project would not comply with these sections for the following reasons:

1. The proposed site is of significant importance to a Critically Endangered species (both for breeding and foraging);
2. Viable alternatives within the region would exist for development on habitats that are modified or are not critical (i.e. don't host White-backed Vulture nests, and are not important feeding grounds within the vicinity of nests);
3. The project would lead to measurable adverse impacts on the biodiversity values of the region;
4. It is likely that the project would lead to a net reduction in the population of White-backed Vultures by virtue of reducing the availability of suitable nesting habitat in the area, and by destroying the adjacent habitat on which they rely for foraging. The avifaunal reports have indicated that *the loss of suitable White-backed vulture habitat as a result of clearing of land for agricultural purposes is one of the reasons for the decline in vulture numbers worldwide (Bunning, 1985), vulture conservation should not only focus to protect individuals or known nesting aggregations, but rather to protect the larger preferred breeding and foraging habitat of the species of the size of the section of available suitable habitat. This will ensure a sustainable future for the species and prevent isolation of breeding colonies.* Thus although not all of the proposed development will have direct impacts on White-backed Vulture nests, it is highly likely that all of the proposed development (for all 3 sites, singularly or collectively) will result in negative population impacts due to the loss of suitable habitat.

Further, due to the likely availability of alternatives (both alternative sites, and alternative low disturbance agriculture – e.g. grazing lands for cattle), the use of Biodiversity Offsets cannot be considered within the IFC Performance Standard 6 framework. BirdLife South Africa's policy is to oppose developments that cannot meet these criteria and which will have a significant impact on threatened bird species. However it is likely that the aforementioned banks would take the same view – due to non-compliance with the IFC Performance Standards – and would not finance this development.

In terms of the EIA legislation, BirdLife South Africa would argue that the proposed development is fatally flawed due to the high likeliness of globally significant and irreversible

	impacts on a Critically Endangered species, and that Biodiversity Offsets cannot be considered as a mitigation measure as alternative sites for development are likely to exist, and alternative forms of agriculture for the site would also exist. We highly appreciate the stance you have taken in suggesting that an avian impact assessment is done before the full EIA process is launched, and before the farmer is heavily committed to the project. Please call or email me if you have any questions about this. Kind regards, Jonathan Booth *Critical Habitat* 16. Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered[11] species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes. 17. In areas of critical habitat, the client will not implement any project activities unless all of the following are demonstrated: ▪ No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical; ▪ The project does not lead to measurable adverse impacts on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values;[12] ▪ The project does not lead to a net reduction in the global and/or national/regional population[13] of any Critically Endangered or Endangered species over a reasonable period of time;[14] and ▪ A robust, appropriately designed, and long-term biodiversity monitoring and evaluation program is integrated into the client's management program. 18. In such cases where a client is able to meet the requirements defined in paragraph 17, the project's mitigation strategy will be described in a Biodiversity Action Plan and will be designed to achieve net gains[15] of those biodiversity values for which the critical habitat was designated. **Jonathan Booth** Advocacy Officer Policy & Advocacy Programme
Response from EAP:	Good day Jonathan Hope all is well? Sorry for the late reply, there were numerous issues / inputs / mitigations that had to be taken up with all relevant departments / stakeholders and the client. Regarding your comments below, thank you very much for your time to provide feedback and inputs to these studies.

	Eco-Con Environmental is pleased to announce that as a result of the significantly high sensitivity of the farm Lorraine no 100, the client, in collaboration with the Independent EAP and Ecological Specialist, have decided to remove the farm Lorraine no 100 from the application to develop. In other word, development will not proceed on the farm Lorraine no 100. This will leave the most pristine area in an undeveloped state. However, the client would like to proceed with the applications on the Farm Zulani no 167 and the farm Bank Drift 164 and portion 1 of the Farm Christiaans Drift no 166. On the Farm Banks Drift and portion 1 of the Farm Christiaans Drift no 166, no Vulture nests were identified, however, on the Farm Zulani, 6 active nests were identified. As a result, the client, based on our inputs, have decided to proceed with these studies on condition that a Biodiversity Offset Report be compiled. The Farm Lorraine no 100 is also included in the offset report to be formally protected in the future. This Biodiversity Offset Report is now complete and will run with the Impact Assessment phase a 30 day public participation period. You will be informed of the availability of these reports, once we are ready to submit, and we ask of you to please review the final impact assessment reports and the offset reports compiled. Your comments, either positive or negative, will then be included in the Final Impact Assessment report which will be submitted to DENC for their decision making process. Again thank you very much. Have a great day Kind regards Johan Botes

8.2 ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The PPP for the Impact Assessment Report commenced on 05 July 2018 and concluded on 03 August 2018. The following means were used to notify the public of the commencement of the process:

- Email notifications were sent to all identified stakeholders, relevant Organs of State and competent authority on 05 July 2018.
- Hardcopies of the Impact Assessment Report were made available at the Siyancuma local Municipality in Douglas and the public library for public viewing on 05 July 2018.

- A hardcopy of the Impact Assessment Report was made available at the Idstone Farming office for public viewing on 05 July 2018.
- A hardcopy was hand delivered at the offices of the competent authority on 05 July 2018.

8.3 LIST OF STAKEHOLDERS / ORGANS OF STATE / LANDOWNERS AND ADJACENT LANDOWNERS NOTIFIED

The following table (table 16) list all identified Stakeholders / Organs of State / Organisations / Interested and Affected Parties which were notified of the proposed project.

Table 16: Stakeholders / Organs of State / Organisations / Interested and Affected Parties notified

Name and Surname	Organisation	Department	Email / Postal:	Tel:
Mr. H.F. Nel	Siyancuma Local Municipality	Municipal Manager	geraldine@siyancuma.gov.za douglas@siyancuma.gov.za	(053) 298 1810
Mr. Chris Groenewald	Siyancuma Local Municipality	Environmental Department	groenewald@siyancuma.co.za	0828440411
Mr. Patrick Mcklein	Siyancuma Local Municipality	Ward 2 (two) Ward Councillor	patrickmcklein@gmail.com	0845339330
Mr. Rodney Pieterse	Pixley Ka Seme District Municipality	Municipal Manager	mm@pksdm.gov.za	0536310891
Mr. S. Nkondeshe	Pixley Ka Seme District Municipality	Environmental Department	pixley@telkomsa.net	0536310891
Me. Natalie Uys	Department of Environment and Nature Conservation	Ecological and Botanical Department	nuys.denc@gmail.com	053 807 7300/7472
Mr. Thulani Mthombeni	Department of Environment and Nature Conservation	Environmental Impact Assessment Department	Tmthombeni@ncpg.gov.za	(053) 807 7430 or Cell: 071 673 7525
Mr. Hannes Roux	Agri Noordkaap		hrouxx@gmail.com	0718607550
Me. Kelly Hannie	Northern Cape department of roads and public works		khannie@ncpg.gov.za	053 839 2249
Mr. Khutjo Sekwaila	Northern Cape Department of Water and Sanitation	Commenting Authority for the region	sekwailak@dws.gov.za	053 836 7609
Mr. Tony Olyn	Northern Cape Department Minerals and Resources	Mineral Regulation	Tony.Olyn@dmr.gov.za	053 807 1705

Me. Belinda Glenn	Endangered Wildlife Trust		belindag@ewt.org.za	011 372 3600 / 072 616 1787
Me. Candice Stevens	BirdlifeSA		Candice.stevens@birdlife.org.za	011 789 1122
Me. Beryl Wilson	McGregor museum		berylwa@gmail.com	0538392727
Dr. Hugo M. Bezuidenhout	SANParks	Specialist: Vegetation Ecologist	Willem.Louw@sanparks.org	082 908 2857 or 053 802 1913
Dr. Charlene Bissett	SANParks	Regional ecologist	charlene.bissett@sanparks.org	
Mr. Johan de Klerk	SANParks – Mukala National Park	Park Manager	johan.deklerk@sanparks.org	
Mr. Lucius Moolman	SANParks	Regional Manager of the Arid region	lucius.moolman@sanparks.org	
Me. Nkhesani Engelina Nefolovhodwe	MUHLAVA MINING (PTY) LTD	Prospecting Right Holder	ancorp7@telkomsa.net	011 268 6167 / 082 213 3358
Mr. Ben Tsietsi Serue	MAXWILL 146 CC	Prospecting Right Holder	tsietsiserue@gmail.com	0846067885
Mr. Nico Smith	Neighbouring / Surrounding Landowners / Occupiers		nssmith@rooksein.co.za	0828002944
Mr. Willem Weenick	Neighbouring / Surrounding Landowners / Occupiers		weenickdiamonds@shisas.com	0828071175
Mr. Johann Mulke	Neighbouring / Surrounding Landowners / Occupiers		P.O. Box 237, Kimberley, 8300	0828279700
Mr. James Thomas	Neighbouring / Surrounding Landowners / Occupiers		Thomasjames1949@gmail.com	0825513706
Mr. John Collen	Neighbouring / Surrounding Landowners / Occupiers		johnycollen@gmail.com	0828221274
Me. Vivian Young	Neighbouring / Surrounding		P.O Box 1667, Kimberley 8300	0834003014

	Landowners / Occupiers			
Mr. Alan Jong	Neighbouring / Surrounding Landowners / Occupiers		P.O Box 1667, Kimberley 8300	0604951019
Mr. Gareth Tait	Endangered Wildlife Trust (EWT)		garetht@ewt.org.za	0824473619
Me. Lesley Booysen	World Wildlife Fund South Africa (WWF)		lbooysen@wwf.org.za	021 657 6600

8.4 COMMENTS AND RESPONSES

All comments received from the I & AP's, stakeholders and organs of state together with the subsequent responses provided were incorporated into a Public Participation Report which is submitted to the competent authority together with the Final Impact Assessment report.

9. ENVIRONMENTAL IMPACT ASSESSMENT

The following section identifies the potential environmental impacts (both positive and negative) which the construction as well as operational phases of the proposed project will have on the surrounding environment.

Once the potential environmental impacts are identified, they are assessed by rating their Environmental Risk after which the final Environmental Significance is calculated and rated for each identified environmental impact.

The same Environmental Risk rating process is then followed for each environmental impact to determine the Environmental Significance if the recommended mitigation measures were to be implemented.

The objective of this section is therefore firstly to identify all the potential environmental impacts of the proposed project and secondly to determine the significance of the impacts and how effective the recommended mitigation measures will be able to reduce their significance. The potential environmental impacts which are still rated as highly significant, even after implementation of mitigations, can then be identified in order to specifically focus on implement of effective management strategies for them.

9.1 METHODOLOGY FOR IMPACT ASSESSMENT AND RISK RATING

The tables below indicate and explain the methodology and criteria used for the evaluation of the Environmental Risk Ratings as well as the calculation of the final Environmental Significance Ratings of the identified potential environmental impacts.

Each potential environmental impact is scored for each of the Evaluation Components as per the table below.

Table 17: Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating Scale and Description/criteria
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	**10 - Very high**: Bio-physical and/or social functions and/or processes might be *severely* altered. **8 - High**: Bio-physical and/or social functions and/or processes might be *considerably* altered. **6 - Medium**: Bio-physical and/or social functions and/or processes might be *notably* altered. **4 - Low** : Bio-physical and/or social functions and/or processes might be *slightly* altered. **2 - Very Low**: Bio-physical and/or social functions and/or processes might be *negligibly* altered. **0 - Zero**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
	10 - Very high (positive): Bio-physical and/or social functions and/or processes might be *substantially* enhanced. **8 - High (positive)**: Bio-physical and/or social functions and/or processes might be *considerably* enhanced.

MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**6 - Medium (positive)**: Bio-physical and/or social functions and/or processes might be *notably* enhanced. **4 - Low (positive)**: Bio-physical and/or social functions and/or processes might be *slightly* enhanced. **2 - Very Low (positive)**: Bio-physical and/or social functions and/or processes might be *negligibly* enhanced. **0 - Zero (positive)**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
DURATION	**5 - Permanent** **4 - Long term**: Impact ceases after operational phase/life of the activity > 60 years. **3 - Medium term**: Impact might occur during the operational phase/life of the activity – 60 years. **2 - Short term**: Impact might occur during the construction phase - < 3 years. **1 - Immediate**
EXTENT (or spatial scale/influence of impact)	**5 - International**: Beyond National boundaries. **4 - National**: Beyond Provincial boundaries and within National boundaries. **3 - Regional**: Beyond 5 km of the proposed development and within Provincial boundaries. **2 - Local**: Within 5 km of the proposed development. **1 - Site-specific**: On site or within 100 m of the site boundary. **0 -** None
IRREPLACEABLE loss of resources	**5 – Definite** loss of irreplaceable resources. **4 – High** potential for loss of irreplaceable resources. **3 – Moderate** potential for loss of irreplaceable resources. **2 – Low** potential for loss of irreplaceable resources. **1 – Very low** potential for loss of irreplaceable resources. **0 - None**
REVERSIBILITY of impact	**5 –** Impact **cannot** be reversed. **4 – Low** potential that impact might be reversed. **3 – Moderate** potential that impact might be reversed. **2 – High** potential that impact might be reversed. **1 –** Impact **will be** reversible. **0 –** No impact.
PROBABILITY (of occurrence)	**5 - Definite**: >95% chance of the potential impact occurring. **4 - High probability**: 75% - 95% chance of the potential impact occurring. **3 - Medium probability**: 25% - 75% chance of the potential impact occurring **2 - Low probability**: 5% - 25% chance of the potential impact occurring.

	1 - Improbable: <5% chance of the potential impact occurring.
Evaluation Component	**Rating Scale and Description/criteria**
CUMULATIVE impacts	**High**: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Medium**: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Low**: The activity is localised and might have a negligible cumulative impact. **None**: No cumulative impact on the environment.

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 18 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 18: Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description/criteria
125 – 150	**Very high (VH)**	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	**High (H)**	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	**Medium-high (MH)**	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	**Medium (M)**	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	**Low (L)**	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.

+	**Positive impact (+)**	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

9.2 DESCRIPTION OF POTENTIAL IMPACTS AND THEIR RECOMMENDED MITIGATION MEASURES

The following section provides a list of potential environmental impacts which the proposed project will have as well as the recommended mitigation measures to be implemented for each impact as identified during the Scoping phase.

9.2.1 Construction Phase

The potential environmental impacts associated with the construction / development phase of the proposed development.

9.2.1.1 Flora Impacts

A direct impact on flora will arise as a result of vegetation clearance.

Mitigation measures to reduce this potential impacts:

- Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation.
- Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.
- The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.
- Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.
- Existing roads and farm tracks in close proximity to the proposed project area must be used during construction.
- A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered.
- An additional ecological walkthrough is to be conducted prior to the commencement of the project during the flowering period of underground bulbous plant species.
- A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities.
- Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment.

- Alien and invasive species need to be eradicated and controlled.

9.2.1.2 Fauna Impacts

A direct impact on flora will arise as a result of vegetation clearance / habitat loss

Mitigation measures to reduce potential impacts:

- The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.
- Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.
- Existing roads and farm tracks in close proximity to the proposed project area must be used during construction.
- A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered.
- An additional Avifaunal walkthrough is to be conducted prior to the commencement of the project in order to determine if Vulture are in breeding time and to possibly help with the identification of trees before they are removed.
- A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities.
- Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment.
- Alien and invasive species need to be eradicated and controlled.

9.2.1.3 Dust Impacts

Dust nuisance generated during the development / preparation of the pivots.
Mitigation measures to reduce potential impacts:

- Dust Management measures must be implemented in order to manage and minimize undesired dust emissions.
- Access roads need to be well maintained and dust suppression need to be applied during windy days.
- Pivots need to be rehabilitated by planting buffalo grass while not in use (7-year cycle apply to these pivots)

9.2.1.4 Noise Impacts

Noise nuisance will be generated during the development / preparation of the pivots resulting from individuals and equipment.

Mitigation measures to reduce potential impacts:

- Limit working hours of noisy equipment to daylight hours.
- Fit silencers to equipment.
- Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to 17:00 Mondays to Fridays).
- Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.
- No loud music is permitted on site or in the camp.

9.2.1.5 Cultural and Heritage Impacts

Damage and destruction of vertebrate fossils during excavation activities may occur.

Mitigation measures to reduce potential impacts:

- Should any heritage resources (including but not limited to fossils, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and or built features, rock art and rock engravings) be exposed during excavations for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority.
- Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given.
- Under no circumstances shall any heritage material be destroyed or removed from site.
- Excavations must be limited to the footprint area and be maintained in a narrow corridor.
- All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:
    - All construction in the immediate 50 metre vicinity of the site must be ceased.
    - The heritage practitioner must be informed as soon as possible.
    - In the event of obvious human remains SAPS must be notified.
    - Mitigation measures (such as refilling) must not be attempted.
    - The area in a 50 metre radius of the find must be barricaded with visible taping.

- Public access must be limited and the area must be placed under guard.

9.2.1.6 Surface and Groundwater Contamination Impacts

Surface and Groundwater Contamination during the development / preparation of the pivots.

Mitigation measures to reduce potential impacts:

- Ensure that excavation areas have a predetermined stockpile area for excavated materials.
- Use overburden for rehabilitation.
- Any remaining overburden to be disposed of at a licensed waste site.
- Alternatively, concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose.
- Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages.
- All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO.
- Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site.
- Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender).
- Vehicles and machinery must be regularly serviced to avoid spillages.
- Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.

9.2.1.7 Waste Management Impacts

Waste impacts by means of waste storage and littering during the development / preparation of the pivots.

Mitigation measures to reduce potential impacts:

- An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited.
- Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle.
- Keep all work sites including storage areas, offices and workshops neat and tidy.

- All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site.
- Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised.
- The burning and burying of solid waste on site is prohibited.
- Littering by construction workers shall not be permitted.
- General waste shall be removed from site on a weekly basis to an approved landfill site.
- Minimise waste by sorting waste into recyclable and non-recyclable materials. Small scale agricultural job creation in the.

9.2.1.8 Traffic Impacts

Traffic impacts by means of additional truck and transportation to and from site during the development / preparation of the pivots.

Mitigation measures to reduce potential impacts:

- Abnormal loads should be timed to avoid times of the year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods.
- All vehicles should be road worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle.
- Any damage to public roads is to be reported to the management authority and repaired to its original condition.
- Signage is to be placed on vehicles at all times.

9.2.1.9 Fire Risk Impacts

Increase risk of fires during the development / preparation of the pivots.

Mitigation measures to reduce potential impacts:

- Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment.
- All construction equipment must have at least one firefighting extinguisher.
- Workers must be adequately trained in the handling of firefighting equipment.
- No open fires are permitted anywhere on site due to the handling of gas on site. No fires will be permitted for heating or cooking purposes on site.
- Fuel and chemicals must be stored in an area that is acceptable for the client.
- No smoking will be allowed within close vicinity of the site.

9.2.1.10 Soil Contamination Impacts

Increased Soil contamination by means of hazardous substances.

Mitigation measures to reduce potential impacts:

- No leaked oil or fuel tankers may contaminate soil
- All tanks and pipes containing fuel or oil must be inspected on a regular basis
- Spills outside the bund area must be treated with a spill kit
- All significant leaks must be reported to the competent authority in terms of NEMA
- UST must be fitted with leak detectors in order to alert when a leak is occurring.
- Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices.
- Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher
- A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions.
- All personnel working with fuel must undergo spill kit training
- The oil/water separator must be inspected on a regular basis and the inspection report must be provided to the ECO and relevant authority.
- Following a leak or accidental spill, a remediation plan must be compiled and executed.
- Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.

9.2.1.11 Soil Erosion Impacts

Increased Soil erosion due to construction activities.

Mitigation measures to reduce potential impacts:

- During construction, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated,
- All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line,
- Temporary cut off drains may be required to capture storm water and promote infiltration,

- All storm water management features must be constructed in a manner that will ensure the continued functioning of the emergent vegetation. Construction must coincide with the dry season.

9.2.1.12 Visual Impacts

Increased visual impact due to increased working activities on-site.

Mitigation measures to reduce potential impacts:

- All waste must be placed in bins during operational phase. Keeping the area litter free.
- Construction activities may only take place during normal working hours.

9.2.1.13 Socio-Economic Impacts

Increased socio-economic conditions due to job creation.

Mitigation measures to reduce potential impacts:

- Ensure that low-, medium- and high skilled workers use provided working opportunities.
- Low-, medium- and high skilled workers must be sourced locally.
- Were practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities.
- Individuals must be trained and continuously developed.

9.2.2 Operational Phase

The potential environmental impacts associated with the operational phase of the proposed development.

9.2.2.1 Flora Impacts

Direct impact on flora as a result of continuous vegetation clearance.

Mitigation measures to reduce potential impacts:

- Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.
- The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.
- Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.

- Existing roads and farm tracks in close proximity to the proposed project area must be used during operation.
- Alien and invasive species need to be eradicated and controlled.

9.2.2.2 Fauna Impacts

Continuous impact on Fauna as a result of cleared vegetation / habitat loss.

Mitigation measures to reduce potential impacts:

- Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.
- Existing roads and farm tracks in close proximity to the proposed project area must be used during operation.
- No hunting of any animal is to take place on site.
- Specials care are to be taken not to work near or disturb any vulture nests, especially during breading seasons.

9.2.2.3 Dust Impacts

Dust nuisance generated during the operational phase of the project.
Mitigation measures to reduce potential impacts:

- Dust Management measures must be implemented in order to manage and minimize undesired dust emissions.
- Access roads need to be well maintained and dust suppression need to be applied during windy days.
- Pivots need to be rehabilitated by planting buffalo grass while not in use (7-year cycle apply to these pivots).

9.2.2.4 Noise Impacts

Noise nuisance generated during the operational phase of the pivots.

Mitigation measures to reduce potential impacts:

- Limit working hours of noisy equipment to daylight hours.
- Fit silencers to equipment.
- Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to 17:00 Mondays to Fridays).
- Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.

- No loud music is permitted on site or in the camp.

9.2.2.5 Cultural Heritage Impacts

Damage and destruction of vertebrate fossils during the operational phase.

Mitigation measures to reduce potential impacts:

- Should any heritage resources (including but not limited to fossils, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and or built features, rock art and rock engravings) be exposed during excavations, all works in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority.
- Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given.
- Under no circumstances shall any heritage material be destroyed or removed from site.
- Excavations must be limited to the footprint area and be maintained in a narrow corridor.
- All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:
    - All construction in the immediate 50 metre vicinity of the site must be ceased.
    - The heritage practitioner must be informed as soon as possible.
    - In the event of obvious human remains SAPS must be notified.
    - Mitigation measures (such as refilling) must not be attempted.
    - The area in a 50 metre radius of the find must be barricaded with visible taping.
- Public access must be limited and the area must be placed under guard.

9.2.2.6 Surface and Groundwater Impacts

Surface and Groundwater Contamination during the operational phase by means of fertilizer and/or any other hazardous substances or pesticides.

Mitigation measures to reduce potential impacts:

- When fertilisers / pesticides are used, ensure that all fertilisers / pesticides are environmentally friendly.
- When fertilisers / pesticides are used, only use the correct amount as indicated by the parcels. Do not over use.

- Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages.
- All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO.
- Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site.
- Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender).
- Vehicles and machinery must be regularly serviced to avoid spillages.
- Drip trays must be placed beneath all stationary equipment and beneath all generators present on site.

9.2.2.7 Waste Management Impacts

As per the construction phase the area poses no archaeological and palaeontological significance or value.

Mitigation measures to reduce potential impacts:

- An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited.
- Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle.
- Keep all work sites including storage areas, offices and workshops neat and tidy.
- All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site.
- Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised.
- The burning and burying of solid waste on site is prohibited.
- Littering by workers shall not be permitted.
- General waste shall be removed from site on a weekly basis to an approved landfill site.
- Minimise waste by sorting waste into recyclable and non-recyclable materials.

9.2.2.8 Traffic Impacts

Traffic impacts by means of additional truck and transportation to and from site during the operational phase of the pivots.

Mitigation measures to reduce potential impacts:

- Abnormal loads should be timed to avoid times of the year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods.
- All vehicles should be road worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle.
- Any damage to public roads is to be reported to the management authority and repaired to its original condition.
- Signage is to be placed on vehicles at all times.

9.2.2.9 Fire Risk Impacts

Increase risk of fires during the operational phase of the pivots.

Mitigation measures to reduce potential impacts:

- Ensure the work site is equipped with adequate firefighting equipment.
- All equipment must have at least one firefighting extinguisher.
- Workers must be adequately trained in the handling of firefighting equipment.
- No open fires are permitted anywhere on site.
- No fires will be permitted for heating or cooking purposes on site.
- Fuel and chemicals must be stored in an area that is acceptable for the client.
- Dedicated smoking areas are to be provided.

9.2.2.10 Soil Contamination Impacts

Increased Soil contamination by means of hazardous substances.

Mitigation measures to reduce potential impacts:

- No leaked oil or fuel tankers may contaminate soil
- All tanks and pipes containing fuel or oil must be inspected on a regular basis
- Spills outside the bund area must be treated with a spill kit
- All significant leaks must be reported to the competent authority in terms of NEMA
- UST must be fitted with leak detectors in order to alert when a leak is occurring.
- Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices.
- Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher

- A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions.
- All personnel working with fuel must undergo spill kit training
- Following a leak or accidental spill, a remediation plan must be compiled and executed.
- Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.

9.2.2.11 Soil Erosion Impacts

Increased Soil erosion due to operational activities.

Mitigation measures to reduce potential impacts:

- During the operational phase, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated,
- All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line,
- Temporary cut off drains may be required to capture storm water and promote infiltration,
- All storm water management features must be constructed in a manner that will ensure the continued functioning of the emergent vegetation. Construction must coincide with the dry season.

9.2.2.12 Visual Impacts

Increased visual impact due to increased working activities during the operational phase.

Mitigation measures to reduce potential impacts:

- All waste must be placed in bins during operational phase. Keeping the area litter free.
- Construction activities may only take place during normal working hours.

9.2.2.13 Socio-Economic Impacts

Increased socio-economic conditions due to job creation.

Mitigation measures to reduce potential impacts:

- Ensure that low-, medium- and high skilled workers use provided working opportunities.
- Low-, medium- and high skilled workers must be sourced locally.

- Were practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities.
- Individuals must be trained and continuously developed

9.2.3 Decommissioning Phase

The potential environmental impacts associated with the decommissioning phase of the proposed development.

9.2.3.1 Dust Impacts

Dust nuisance generated during the decommissioning phase of the project.

Mitigation measures to reduce potential impacts:

- Dust Management measures must be implemented in order to manage and minimize undesired dust emissions.
- Access roads and pivot areas to be decommissioned are to be ripped and seeded for vegetation regrowth to avoid dust.
- Pivots need to be rehabilitated by planting buffalo grass.

9.2.3.2 Surface and Groundwater Contamination Impacts

Surface and Groundwater Contamination during the decommissioning phase by means of fertilizer and/or any other hazardous substances or pesticides.

Mitigation measures to reduce potential impacts:

- When fertilisers / pesticides are used in the planting of seeds, ensure that all fertilisers / pesticides are environmentally friendly.
- When fertilisers / pesticides are used, only use the correct amount as indicated by the parcels. Do not over use.
- Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages.
- All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO.

- Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site.
- Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender).
- Vehicles and machinery must be regularly serviced to avoid spillages.
- Drip trays must be placed beneath all stationary equipment and beneath all generators present on site.

9.2.3.3 Waste Management Impacts

Waste impacts by means of waste storage and littering during the decommissions phase of the pivots.

Mitigation measures to reduce potential impacts:

- An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited.
- Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle.
- Keep all work sites including storage areas, offices and workshops neat and tidy.
- All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site.
- Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised.
- The burning and burying of solid waste on site is prohibited.
- Littering by workers shall not be permitted.
- General waste shall be removed from site to an approved landfill site.

9.2.3.4 Soil Contamination Impacts

Increased Soil contamination by means of hazardous substances.

Mitigation measures to reduce potential impacts:

- No leaked oil or fuel tankers may contaminate soil
- Spills outside the bund area must be treated with a spill kit
- All significant leaks must be reported to the competent authority in terms of NEMA
- Following a leak or accidental spill, a remediation plan must be compiled and executed.

9.2.3.5 Soil Erosion Impacts

Increased Soil erosion due to decommissioning activities.

Mitigation measures to reduce potential impacts:

- During the decommissioning phase, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated,
- All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line,
- Temporary cut off drains may be required to capture storm water and promote infiltration,

9.2.3.6 Socio-Economic Impacts

Increased socio-economic conditions due to job loss.

Mitigation measures to reduce potential impacts:

- Ensure that low-, medium- and high skilled workers working at the farm are given advance notice in terms of the decommissioning.
- Assist Low-, medium- and high skilled worker in finding other possible vacancies.

9.3 RISK RATINGS OF POTENTIAL IMPACTS

The following section provides the Environmental Risk as well as the Environmental Significance Ratings for the potential environmental impacts for the proposed project both before and after implementation of the recommended mitigation measures.

9.4 IMPACT ASSESSMENT

9.4.1 Planning, Design and Construction Phase

PLANNING, DESIGN AND CONSTRUCTION PHASE					
Potential Flora Impacts:					
Nature of impact: Direct impact on Flora as a result of the Transformation of terrestrial vegetation on the proposed project footprint				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	8	6	6	4	2
Duration:	4	4	4	4	1
Extent:	2	2	2	2	1
Irreplaceable:	3	3	3	3	1
Reversibility:	3	3	3	3	2
Probability:	4	4	4	4	2
Total SP:	80	72	72	64	14
Significance rating:	Medium – High (MH)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Proposed Mitigation:	• Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation. • Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional ecological walkthrough is to be conducted prior to the commencement of the project during the flowering period of underground bulbous plant species. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.				
Nature of impact: Direct impact on Flora as a result of the Transformation of a Critical Biodiversity Area two (CBA 2)				**Activity:** Proposed development of seed potato pivots	

Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Magnitude:	10	6	6	6	2
Duration:	4	4	4	4	1
Extent:	3	3	3	3	1
Irreplaceable:	4	4	4	4	1
Reversibility:	3	3	3	2	2
Probability:	5	4	4	4	2
Total SP:	120	80	80	76	14
Significance rating:	High (H)	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Low (L)
Cumulative impact:	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Low (L)
Proposed Mitigation:	• Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation. • Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional ecological walkthrough is to be conducted prior to the commencement of the project during the flowering period of underground bulbous plant species. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.				
Nature of impact: Direct impact on Flora as a result of the Destruction/damage to Red Data Listed, nationally or provincially protected species individuals			**Activity:** Proposed development of seed potato pivots		

Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Magnitude:	10	8	8	8	2
Duration:	4	4	4	4	1
Extent:	3	4	3	3	1
Irreplaceable:	4	4	4	4	1
Reversibility:	4	3	4	3	2

Probability:	5	4	5	4	2
Total SP:	125	92	120	88	14
Significance rating:	Very High V(H)	Medium – High (MH)	High (H)	Medium – High (MH)	Low (L)
Cumulative impact:	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Medium – High (MH)	Low (L)
Proposed Mitigation:	• Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation. • Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional ecological walkthrough is to be conducted prior to the commencement of the project during the flowering period of underground bulbous plant species. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.				
Nature of impact: Direct impact on Flora as a result of Alien invasive species establishment				**Activity:** Proposed development of seed potato pivots	

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	6	6	6	2
Duration:	2	2	2	2	1
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	2	2	2	2
Probability:	4	2	4	4	2
Total SP:	56	28	56	28	14
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation. • Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.				

	• Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional ecological walkthrough is to be conducted prior to the commencement of the project during the flowering period of underground bulbous plant species. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.

Potential Avifauna Impacts:

Nature of impact: Direct impact on White-backed Vultures *(Gyps africanus)* as a result of vegetation clearance transforming the foraging area	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	10	8	10	8	2
Duration:	4	4	4	4	3
Extent:	4	4	4	4	1
Irreplaceable:	5	5	5	5	1
Reversibility:	4	4	4	4	1
Probability:	5	5	5	5	1
Total SP:	135	125	135	125	8
Significance rating:	Very High (VH)	High (H)	Very High (VH)	High (H)	Low (L)
Cumulative impact:	High (H)	High (H)	High (H)	High (H)	Low (L)
Proposed Mitigation:	• The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional Avifaunal walkthrough is to be conducted prior to the commencement of the project in order to determine if Vulture are in breeding time and to possibly help with the identification of trees before they are removed. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.				

Nature of impact: Direct impact on White-backed Vultures *(Gyps africanus)* as a result of vegetation clearance transforming the breeding habitat					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	10	8	10	8	2
Duration:	4	4	4	4	3
Extent:	4	4	4	4	1
Irreplaceable:	5	5	5	5	1
Reversibility:	4	4	4	4	1
Probability:	5	5	5	5	1
Total SP:	135	125	135	125	8
Significance rating:	Very High (VH)	High (H)	Very High (VH)	High (H)	Low (L)
Cumulative impact:	High (H)	High (H)	High (H)	High (H)	Low (L)
Proposed Mitigation:	• The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional Avifaunal walkthrough is to be conducted prior to the commencement of the project in order to determine if Vulture are in breeding time and to possibly help with the identification of trees before they are removed. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.				

Nature of impact: Direct impact on other avifaunal species as a result of vegetation clearance transforming the breeding habitat					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	6	4	2
Duration:	4	4	4	4	3
Extent:	3	3	3	3	1
Irreplaceable:	4	3	4	3	1

Reversibility:	3	3	3	3	1
Probability:	4	4	4	4	1
Total SP:	80	68	80	68	8
Significance rating:	Medium-high (MH)	Medium (M)	Medium-high (MH)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Proposed Mitigation:	• The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional Avifaunal walkthrough is to be conducted prior to the commencement of the project in order to determine if Vulture are in breeding time and to possibly help with the identification of trees before they are removed. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.				

Nature of impact: Direct impact on other avifaunal species as a result of vegetation clearance transforming the foraging area	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	4	2	4	2	2
Duration:	4	4	4	4	3
Extent:	3	3	3	3	1
Irreplaceable:	3	3	3	3	1
Reversibility:	3	3	3	3	1
Probability:	4	4	4	4	1
Total SP:	68	60	68	60	8
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Proposed Mitigation:	• The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction.				

	• A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional Avifaunal walkthrough is to be conducted prior to the commencement of the project in order to determine if Vulture are in breeding time and to possibly help with the identification of trees before they are removed. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.

Potential Fauna Impacts:

Nature of impact: Direct impact on other faunal species as a result of vegetation clearance transforming the breeding habitat	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	6	4	2
Duration:	4	4	4	4	3
Extent:	3	3	3	3	1
Irreplaceable:	4	3	4	3	1
Reversibility:	3	3	3	3	1
Probability:	4	4	4	4	1
Total SP:	80	68	80	68	8
Significance rating:	Medium-high (MH)	Medium (M)	Medium-high (MH)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)

Proposed Mitigation:	• The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional Avifaunal walkthrough is to be conducted prior to the commencement of the project in order to determine if Vulture are in breeding time and to possibly help with the identification of trees before they are removed. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.
Nature of impact:	**Activity:**

Direct impact on other faunal species as a result of vegetation clearance transforming the foraging area			Proposed development of seed potato pivots		
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	4	2	4	2	2
Duration:	4	4	4	4	3
Extent:	3	3	3	3	1
Irreplaceable:	3	3	3	3	1
Reversibility:	3	3	3	3	1
Probability:	4	4	4	4	1
Total SP:	68	60	68	60	8
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Proposed Mitigation:	• The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. • A suitable ecological offset area, which can be formally protected in order to compensate for the transformation of the proposed project area, need to be applied for and registered. • An additional Avifaunal walkthrough is to be conducted prior to the commencement of the project in order to determine if Vulture are in breeding time and to possibly help with the identification of trees before they are removed. • A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities. • Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment. • Alien and invasive species need to be eradicated and controlled.				

Potential Dust Impacts:					
Nature of impact: Dust nuisance generated during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	6	2	2
Duration:	2	2	2	2	2
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	1	2	1	2
Probability:	4	3	4	3	2

Total SP:	56	42	56	42	16
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Dust Management measures must be implemented in order to manage and minimize undesired dust emissions. • Access roads need to be well maintained and dust suppression need to be applied during windy days. • Pivots need to be rehabilitated by planting buffalo grass while not in use (7-year cycle apply to these pivots)				
Potential Noise Impacts:					
Nature of impact: Noise nuisance generated during the development / preparation of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	2
Duration:	2	2	2	2	2
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	1	2	1	2
Probability:	2	2	2	2	2
Total SP:	24	18	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Limit working hours of noisy equipment to daylight hours. • Fit silencers to equipment. • Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to 17:00 Mondays to Fridays). • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. • No loud music is permitted on site or in the camp.				
Potential Cultural and Heritage Impacts:					
Nature of impact: Damage and destruction of vertebrate fossils during excavation activities.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	0
Duration:	2	1	2	1	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1

Reversibility:	2	1	2	1	1
Probability:	1	1	1	1	1
Total SP:	9	6	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Proposed Mitigation:	• Should any heritage resources (including but not limited to fossils, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and or built features, rock art and rock engravings) be exposed during excavations for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority.
	• Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given.
	• Under no circumstances shall any heritage material be destroyed or removed from site.
	• Excavations must be limited to the footprint area and be maintained in a narrow corridor.
	• All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:
	  • All construction in the immediate 50 metre vicinity of the site must be ceased.
	  • The heritage practitioner must be informed as soon as possible.
	  • In the event of obvious human remains SAPS must be notified.
	  • Mitigation measures (such as refilling) must not be attempted.
	  • The area in a 50 metre radius of the find must be barricaded with visible taping.
	• Public access must be limited and the area must be placed under guard.				

Potential Surface and Groundwater Contamination Impacts:					
Nature of impact: Surface and Groundwater Contamination during the development / preparation of the pivots.			**Activity:** Proposed development of seed potato pivots		
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	0
Extent:	2	1	2	1	0
Irreplaceable:	1	1	1	1	0
Reversibility:	1	1	1	1	0
Probability:	1	1	1	1	0
Total SP:	7	4	7	4	0
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Proposed Mitigation:	• Ensure that excavation areas have a predetermined stockpile area for excavated materials. • Use overburden for rehabilitation. • Any remaining overburden to be disposed of at a licensed waste site. • Alternatively, concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages. • All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site. • Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.

Nature of impact:	**Activity:**
Impeding and contamination of the surface water catchment and drainage area towards the Riet River.	Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	6	4	6	0
Duration:	2	2	2	2	0
Extent:	3	3	3	3	0
Irreplaceable:	3	3	3	2	0
Reversibility:	2	2	2	1	0
Probability:	4	3	4	3	0
Total SP:	64	48	56	42	0
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)

Proposed Mitigation:	• Ensure that excavation areas have a predetermined stockpile area for excavated materials. • Use overburden for rehabilitation. • Any remaining overburden to be disposed of at a licensed waste site. • Alternatively, concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages. • All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site.

	• Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.

Potential Waste Management Impacts:

Nature of impact: Waste impacts by means of waste storage and littering during the development / preparation of the pivots.					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	2
Duration:	2	2	2	2	2
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	1	2	1	2
Probability:	2	2	2	2	2
Total SP:	24	18	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited. • Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle. • Keep all work sites including storage areas, offices and workshops neat and tidy. • All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site. • Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised. • The burning and burying of solid waste on site is prohibited. • Littering by construction workers shall not be permitted. • General waste shall be removed from site on a weekly basis to an approved landfill site. • Minimise waste by sorting waste into recyclable and non-recyclable materials.				

Potential Traffic Impacts:

Nature of impact: Traffic impacts by means of additional truck and transportation to and from site during the development / preparation of the pivots.					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	0

Duration:	2	1	2	1	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1
Reversibility:	2	1	2	1	1
Probability:	1	1	1	1	1
Total SP:	9	6	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Abnormal loads should be timed to avoid times of the year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods. • All vehicles should be road worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. • Any damage to public roads is to be reported to the management authority and repaired to its original condition. • Signage is to be placed on vehicles at all times.				

Potential Fire Risk Impacts:

Nature of impact:	**Activity:**
Increase risk of fires during the development / preparation of the pivots.	Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	0
Duration:	1	1	1	1	1
Extent:	2	1	2	1	1
Irreplaceable:	2	1	2	1	1
Reversibility:	2	1	2	1	1
Probability:	1	1	1	1	1
Total SP:	9	6	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment. • All construction equipment must have at least one firefighting extinguisher. • Workers must be adequately trained in the handling of firefighting equipment. • No open fires are permitted anywhere on site due to the handling of gas on site. No fires will be permitted for heating or cooking purposes on site. • Fuel and chemicals must be stored in an area that is acceptable for the client. • No smoking will be allowed within close vicinity of the site.				

Potential Soil Contamination Impacts:

Nature of impact: Increased Soil contamination by means of hazardous substances.					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1
Reversibility:	1	0	1	0	1
Probability:	2	1	2	1	1
Total SP:	14	3	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• No leaked oil or fuel tankers may contaminate soil • All tanks and pipes containing fuel or oil must be inspected on a regular basis • Spills outside the bund area must be treated with a spill kit • All significant leaks must be reported to the competent authority in terms of NEMA • UST must be fitted with leak detectors in order to alert when a leak is occurring. • Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices. • Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher • A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions. • All personnel working with fuel must undergo spill kit training • The oil/water separator must be inspected on a regular basis and the inspection report must be provided to the ECO and relevant authority. • Following a leak or accidental spill, a remediation plan must be compiled and executed. • Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.				

Potential Soil Erosion Impacts:					
Nature of impact: Increased Soil erosion due to construction activities.					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	4	4	0
Duration:	2	2	2	2	1
Extent:	1	1	1	1	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	2	2	2	1

Probability:	4	3	4	3	1
Total SP:	52	33	44	33	4
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• During construction, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated, • All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line, • Temporary cut off drains may be required to capture storm water and promote infiltration, • All storm water management features must be constructed in a manner that will ensure the continued functioning of the emergent vegetation. Construction must coincide with the dry season.				

Potential Visual Impacts:					
Nature of impact: Increased visual impact due to increased working activities on-site.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1
Reversibility:	1	0	1	0	1
Probability:	2	1	2	1	1
Total SP:	14	3	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• All waste must be placed in bins during operational phase. Keeping the area litter free. • Construction activities may only take place during normal working hours.				

Potential Socio-Economic Impacts:					
Nature of impact: Increased socio-economic conditions due to job creation				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	8	6	8	8
Duration:	1	1	1	1	1

Extent:	2	2	2	2	2
Irreplaceable:	2	2	2	2	2
Reversibility:	2	2	2	2	2
Probability:	4	5	4	5	4
Total SP:	52	75	52	75	60
Significance rating:	+ Medium (M)	+ Medium-high (MH)	+ Medium (M)	+ Medium-high (MH)	Medium (M)
Cumulative impact:	+ Medium (M)	+ Medium (M)	+ Medium (M)	+ Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure that low-, medium- and high skilled workers use provided working opportunities. • Low-, medium- and high skilled workers must be sourced locally. • Were practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities. • Individuals must be trained and continuously developed				

9.4.2 Operational Phase Impacts

OPPERATIONAL PHASE					
Potential Flora Impacts:					
Nature of impact: Impeding of the ecological connectivity and functionality of the broader remaining natural corridor.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	4	4	2
Duration:	3	3	3	3	1
Extent:	3	3	3	3	1
Irreplaceable:	3	3	3	3	1
Reversibility:	2	2	2	2	2
Probability:	4	4	4	4	2
Total SP:	68	60	60	60	14
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Proposed Mitigation:	• Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during operation.				

	• Alien and invasive species need to be eradicated and controlled.				
Nature of impact: Direct impact on flora as a result of Alien Invasive Species Establishment.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	6	6	6	2
Duration:	3	3	3	3	1
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	2	2	2	2
Probability:	4	2	4	2	2
Total SP:	60	30	60	30	14
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Any accidental fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place. • Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during operation. • Alien and invasive species need to be eradicated and controlled.				
Potential Fauna and Avifauna Impacts:					
Nature of impact: Continuous impact on Fauna and Avifauna as a result of cleared alien invasive species establishment.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	6	6	6	2
Duration:	3	3	3	3	1
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	2	2	2	2
Probability:	4	2	4	2	2
Total SP:	60	30	60	30	14
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Proposed Mitigation:	• Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ. • Existing roads and farm tracks in close proximity to the proposed project area must be used during operation. • No hunting of any animal is to take place on site. • Specials care are to be taken not to work near or disturb any vulture nests, especially during breading seasons.

Potential Dust Impacts:

Nature of impact: Dust nuisance generated during the operational phase of the project.					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	6	6	6	2
Duration:	3	3	3	3	2
Extent:	2	2	2	2	1
Irreplaceable:	2	1	2	1	1
Reversibility:	2	1	2	1	2
Probability:	4	2	4	2	2
Total SP:	60	39	60	39	16
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Dust Management measures must be implemented in order to manage and minimize undesired dust emissions. • Access roads need to be well maintained and dust suppression need to be applied during windy days. • Pivots need to be rehabilitated by planting buffalo grass while not in use (7-year cycle apply to these pivots)				

Potential Noise Impacts:

Nature of impact: Noise nuisance generated during the operational phase of the pivots.					**Activity:** Proposed development of seed potato pivots
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	2
Duration:	2	2	2	2	2
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	1	2	1	2
Probability:	2	2	2	2	2
Total SP:	24	18	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Limit working hours of noisy equipment to daylight hours. • Fit silencers to equipment. • Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to 17:00 Mondays to Fridays). • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. • No loud music is permitted on site or in the camp.				
Potential Cultural and Heritage Impacts:					
Nature of impact: Damage and destruction of vertebrate fossils during the operational phase.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	0
Duration:	2	1	2	1	1
Extent:	1	1	1	1	1
Irreplaceable:	1	1	1	1	1
Reversibility:	1	1	1	1	1
Probability:	1	1	1	1	1
Total SP:	7	6	7	6	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

Proposed Mitigation:	• Should any heritage resources (including but not limited to fossils, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and or built features, rock art and rock engravings) be exposed during excavations, all works in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority.
	• Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given.
	• Under no circumstances shall any heritage material be destroyed or removed from site.
	• Excavations must be limited to the footprint area and be maintained in a narrow corridor.
	• All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:
	  • All construction in the immediate 50 metre vicinity of the site must be ceased.
	  • The heritage practitioner must be informed as soon as possible.
	  • In the event of obvious human remains SAPS must be notified.
	  • Mitigation measures (such as refilling) must not be attempted.
	  • The area in a 50 metre radius of the find must be barricaded with visible taping.
	• Public access must be limited and the area must be placed under guard.				

Potential Surface and Groundwater Contamination Impacts:					
Nature of impact: Surface and Groundwater Contamination during the operational phase by means of fertilizer and/or any other hazardous substances or pesticides.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	0
Extent:	2	1	2	1	0
Irreplaceable:	1	1	1	1	0
Reversibility:	1	1	1	1	0
Probability:	1	1	1	1	0
Total SP:	7	4	7	4	0
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• When fertilisers / pesticides are used, ensure that all fertilisers / pesticides are environmentally friendly. • When fertilisers / pesticides are used, only use the correct amount as indicated by the parcels. Do not over use. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages. • All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site. • Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary equipment and beneath all generators present on site.				
Nature of impact: Impeding and contamination of the surface water catchment and drainage area towards the Riet River.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	6	4	6	0
Duration:	2	2	2	2	0
Extent:	3	3	3	3	0
Irreplaceable:	3	3	3	2	0
Reversibility:	2	2	2	1	0
Probability:	4	3	4	3	0

Total SP:	64	48	56	42	0
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Proposed Mitigation:	• Ensure that excavation areas have a predetermined stockpile area for excavated materials. • Use overburden for rehabilitation. • Any remaining overburden to be disposed of at a licensed waste site. • Alternatively, concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages. • All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site. • Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.				

Potential Waste Management Impacts:					
Nature of impact: Waste impacts by means of waste storage and littering during the operational phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	2
Duration:	2	2	2	2	2
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	1	2	1	2
Probability:	2	2	2	2	2
Total SP:	24	18	24	18	16
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited. • Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle. • Keep all work sites including storage areas, offices and workshops neat and tidy. • All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site. • Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised.				

	• The burning and burying of solid waste on site is prohibited. • Littering by workers shall not be permitted. • General waste shall be removed from site on a weekly basis to an approved landfill site. • Minimise waste by sorting waste into recyclable and non-recyclable materials.

Potential Traffic Impacts:					
Nature of impact: Traffic impacts by means of additional truck and transportation to and from site during the operational phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	0
Duration:	2	1	2	1	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1
Reversibility:	2	1	2	1	1
Probability:	1	1	1	1	1
Total SP:	9	6	9	6	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Abnormal loads should be timed to avoid times of the year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods. • All vehicles should be road worthy, be maintained to prevent fuel or oil leaks and drivers are to be licensed appropriately for the driving of their assigned vehicle. • Any damage to public roads is to be reported to the management authority and repaired to its original condition. • Signage is to be placed on vehicles at all times.				

Potential Fire Risk Impacts:					
Nature of impact: Increase risk of fires during the operational phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	0
Duration:	2	1	2	1	1
Extent:	1	1	1	1	1
Irreplaceable:	1	1	1	1	1

Reversibility:	1	1	1	1	1
Probability:	1	1	1	1	1
Total SP:	7	6	7	6	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure the work site is equipped with adequate firefighting equipment. • All equipment must have at least one firefighting extinguisher. • Workers must be adequately trained in the handling of firefighting equipment. • No open fires are permitted anywhere on site. • No fires will be permitted for heating or cooking purposes on site. • Fuel and chemicals must be stored in an area that is acceptable for the client. • Dedicated smoking areas are to be provided.				

Potential Soil Contamination Impacts:					
Nature of impact: Increased Soil contamination by means of hazardous substances.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1
Reversibility:	1	0	1	0	1
Probability:	2	1	2	1	1
Total SP:	14	3	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• No leaked oil or fuel tankers may contaminate soil • All tanks and pipes containing fuel or oil must be inspected on a regular basis • Spills outside the bund area must be treated with a spill kit • All significant leaks must be reported to the competent authority in terms of NEMA • UST must be fitted with leak detectors in order to alert when a leak is occurring. • Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices. • Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher • A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions. • All personnel working with fuel must undergo spill kit training				

	• Following a leak or accidental spill, a remediation plan must be compiled and executed. • Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.

Potential Soil Erosion Impacts:					
Nature of impact: Increased Soil erosion due to operational activities.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	4	4	0
Duration:	3	3	3	3	1
Extent:	1	1	1	1	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	2	2	2	1
Probability:	4	3	4	3	1
Total SP:	56	36	48	36	4
Significance rating:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• During the operational phase, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated, • All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line, • Temporary cut off drains may be required to capture storm water and promote infiltration, • All storm water management features must be constructed in a manner that will ensure the continued functioning of the emergent vegetation. Construction must coincide with the dry season.				

Potential Visual Impacts:					
Nature of impact: Increased visual impact due to increased working activities during the operational phase.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1
Reversibility:	1	0	1	0	1
Probability:	2	1	2	1	1

Total SP:	14	3	14	3	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• All waste must be placed in bins during operational phase. Keeping the area litter free. • Construction activities may only take place during normal working hours.				
Potential Water Usage Impacts:					
Nature of impact: Impact on water usage due to over extraction from the Riet River.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	6	6	6	0
Duration:	3	3	3	3	1
Extent:	3	2	3	2	1
Irreplaceable:	3	2	3	2	1
Reversibility:	2	2	2	2	1
Probability:	4	3	4	3	1
Total SP:	68	45	68	45	4
Significance rating:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Low (L)
Cumulative impact:	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
Proposed Mitigation:	• All waste must be placed in bins during operational phase. Keeping the area litter free. • Construction activities may only take place during normal working hours.				
Potential Socio-Economic Impacts:					
Nature of impact: Increased socio-economic conditions due to job creation				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	8	6	8	8
Duration:	1	1	1	1	1
Extent:	2	2	2	2	2
Irreplaceable:	2	2	2	2	2
Reversibility:	2	2	2	2	2
Probability:	4	5	4	5	4
Total SP:	52	75	52	75	60

Significance rating:	+ Medium (M)	+ Medium-high (MH)	+ Medium (M)	+ Medium-high (MH)	Medium (M)
Cumulative impact:	+ Medium (M)	+ Medium (M)	+ Medium (M)	+ Medium (M)	Medium (M)
Proposed Mitigation:	• Ensure that low-, medium- and high skilled workers use provided working opportunities. • Low-, medium- and high skilled workers must be sourced locally. • Were practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities. • Individuals must be trained and continuously developed				

9.4.3 Decommissioning Phase Impacts

DECOMMISION PHASE					
Potential Dust Impacts:					
Nature of impact: Dust nuisance generated during the decommissioning phase of the project.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	4	2	2
Duration:	1	1	1	1	2
Extent:	2	2	2	2	1
Irreplaceable:	1	1	1	1	1
Reversibility:	2	1	2	1	2
Probability:	2	2	2	2	2
Total SP:	24	18	20	14	16
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• Dust Management measures must be implemented in order to manage and minimize undesired dust emissions. • Access roads and pivot areas to be decommissioned are to be ripped and seeded for vegetation regrowth to avoid dust. • Pivots need to be rehabilitated by planting buffalo grass.				
Potential Surface and Groundwater Contamination Impacts:					
Nature of impact: Surface and Groundwater Contamination during the decommissioning phase by means of fertilizer and/or any other hazardous substances or pesticides.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	

Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	1
Extent:	2	1	2	1	1
Irreplaceable:	1	1	1	1	1
Reversibility:	1	1	1	1	1
Probability:	1	1	1	1	1
Total SP:	7	4	7	4	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• When fertilisers / pesticides are used in the planting of seeds, ensure that all fertilisers / pesticides are environmentally friendly. • When fertilisers / pesticides are used, only use the correct amount as indicated by the parcels. Do not over use. • Material Safety Data Sheets (MSDS) must be available on site for all chemicals and hazardous substances to be used on site, including information on their ecological impacts and how to minimise the impacts in case of any leakages. • All spills must be cleaned as soon as they occur. A spill kit must be used and proof of clean up must be given to the ECO. • Spillages of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site. • Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender). • Vehicles and machinery must be regularly serviced to avoid spillages. • Drip trays must be placed beneath all stationary equipment and beneath all generators present on site.				

Potential Waste Management Impacts:					
Nature of impact: Waste impacts by means of waste storage and littering during the decommissions phase of the pivots.				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	2	2	2	2
Duration:	1	1	1	1	2
Extent:	1	1	1	1	1
Irreplaceable:	1	1	1	1	1
Reversibility:	1	1	1	1	2
Probability:	1	1	1	1	2
Total SP:	6	6	6	6	16
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited.				

	• Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle. • Keep all work sites including storage areas, offices and workshops neat and tidy. • All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site. • Care should be taken to ensure that no waste fall off disposal vehicles on-route to the landfill site. If needed, a tarpaulin can be utilised. • The burning and burying of solid waste on site is prohibited. • Littering by workers shall not be permitted. • General waste shall be removed from site to an approved landfill site.

Potential Soil Contamination Impacts:

Nature of impact: Increased Soil contamination by means of hazardous substances.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	2	0	2	0	0
Duration:	1	1	1	1	1
Extent:	2	1	2	1	1
Irreplaceable:	1	1	1	1	1
Reversibility:	1	1	1	1	1
Probability:	1	1	1	1	1
Total SP:	7	4	7	4	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	• No leaked oil or fuel tankers may contaminate soil • Spills outside the bund area must be treated with a spill kit • All significant leaks must be reported to the competent authority in terms of NEMA • Following a leak or accidental spill, a remediation plan must be compiled and executed.				

Potential Soil Erosion Impacts:

Nature of impact: Increased Soil erosion due to decommissioning activities.	**Activity:** Proposed development of seed potato pivots

Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	4	2	0
Duration:	2	2	2	2	1
Extent:	1	1	1	1	1
Irreplaceable:	2	1	2	1	1

Reversibility:	2	1	2	1	1
Probability:	2	1	2	1	1
Total SP:	26	9	22	7	4
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Cumulative impact:	Medium (M)	Medium (M)	Medium (M)	Medium (M)	Medium (M)
Proposed Mitigation:	• During the decommissioning phase, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, rows of straw or hay bales, or bundles of cut vegetation sourced with the ECO's knowledge and consent, should be dug into the soil in contours to slow surface wash and capture eroded soil. The method may also be used where surface run-off becomes concentrated, • All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line, • Temporary cut off drains may be required to capture storm water and promote infiltration,				

Potential Socio-Economic Impacts:					
Nature of impact: Increased socio-economic conditions due to job loss				**Activity:** Proposed development of seed potato pivots	
Evaluation Component:	**Preferred Layout Alternative**		**Layout Alternative 2**		**No-Go Alternative**
	Before Mitigation	**After Mitigation**	**Before Mitigation**	**After Mitigation**	
Magnitude:	6	4	4	2	6
Duration:	3	2	3	2	1
Extent:	3	3	3	3	2
Irreplaceable:	2	1	2	1	2
Reversibility:	2	2	2	2	2
Probability:	2	2	2	2	4
Total SP:	32	24	28	20	52
Significance rating:	Low (L)	Low (L)	Low (L)	Low (L)	+ Medium (M)
Cumulative impact:	Low (L)	Low (L)	Low (L)	Low (L)	+ Medium (M)
Proposed Mitigation:	• Ensure that low-, medium- and high skilled workers working at the farm are given advance notice in terms of the decommissioning. • Assist Low-, medium- and high skilled worker in finding other possible vacancies.				

9.5 CUMULATIVE IMPACTS

There are various cultivated areas in the vicinity, specifically directly adjacent or in close proximity to the Riet River for water and irrigation purposes. The majority of the area is however still under natural veld conditions rendering the cumulative impacts of the project less significant. The identified impacts together with their cumulative effects have been discussed under heading 9.4.

The cumulative effects of most of the identified impacts are regarded as low - medium. The only impacts which could potentially cumulatively contribute to more significant combined effects are the transformation of the relevant vegetation type and the impact on Avifauna, especially the Vultures in the area.

9.6 PREFERRED ALTERNATIVE CONCLUDING STATEMENT

In identifying, evaluating and comparing impacts associated with the proposed pivot establishment and considered alternatives as well as financial and logistic feasibility, it has been concluded that alternative two is the best possible alternative for the proposed project.

10. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The processes of investigation which have led to the production of this report, harbours several **assumptions**, which include the following:

- All information provided by the applicant and his/her assistants to the environmental team was correct and valid at the time that it was provided;
- Strategic level investigations undertaken by the agricultural specialist upon instruction from the applicant prior to the commencement of the EIA process, determined that the development site represents a potentially suitable and technically acceptable location;
- The public received a fair and sufficient opportunity to participate in the Scoping process, through the provision of adequate public participation timeframes stipulated in the Regulations;
- The need and desirability was based on strategic national, provincial and local plans and policies which reflect the interests of both statutory and public viewpoints;
- The information provided by specialists is accurate and unbiased;
- The Scoping process is a project-level framework and is limited to assessing the anticipated environmental impacts associated with the construction and operational phases of the proposed facility
- Strategic level decision making is conducted through cooperative governance principles with the consideration of sustainable and responsible development principles underpinning all decision making.

Given that an EIA involves prediction, **uncertainty** forms an integral part of the process. Two types of uncertainty are associated with the EIA process, namely process-related and prediction-related.

- Uncertainty of prediction is critical at the data collection phase as final certainty will only be obtained upon implementation of the proposed development. Adequate research, experience and expertise may minimise this uncertainty;
- Uncertainty of values depicts the approach assumed during the Scoping process, while final certainty will be determined at the time of decision making. Enhanced communication and widespread/comprehensive coordination can lower uncertainty;
- Uncertainty of related decision relates to the interpretation and decision making aspect of the EIA process, which shall be appeased once monitoring of the project phases is undertaken.

The significance/importance of widespread/comprehensive consultation towards minimising the risk/possibility of omitting significant impacts is further stressed. The use of quantitative impact significance

rating formulas (as utilised in this document) can further standardise the interpretation of results and limit the occurrence and scale of uncertainty.

Gaps in knowledge can be attributed to:

The EIA process is being undertaken prior to the availing of certain information which would be derived from the final project design and layout. As such, technical aspects included herein are mainly derived through personal communication with the applicant and the project manager.

The potential impacts of the cultivation induced soil hydrology and fertility changes on the protected species individuals which are not removed from site is also uncertain to a degree. It is envisaged that an adequate buffer should minimise the risk of such changes potentially impacting on the longevity of these protected individuals.

The principle of human nature also provides for uncertainties with regards to the identified socio-economic impacts of the proposed development.

Eco-Con Environmental is an independent environmental consulting firm and as such, all processes and attributes of the EIA are addressed in a fair and unbiased/objective manner. It is believed that through the running of a transparent and participatory process, risks associated with assumptions, uncertainties and gaps in knowledge can be and have been acceptably reduced.

11. PROFESSIONAL OPINION OF THE EAP AND ENVIRONMENTAL IMPACT STATEMENT

11.1 PROFESSIONAL OPINION OF THE EAP

It is in the opinion of the EAP that, by application of the NEMA Mitigation Hierarchy, the significance of residual impacts associated with transformation of the CBA 2 and destruction of nationally protected tree species and critically endangered bird species habitat cannot be suitably reduced and mitigated to within acceptable levels for Alternative 1. This must therefore be seen as a fatal flaw for the proposed Alternative 1 and it is therefore not recommended that Alternative 1 be considered.

Although Alternative 2 will result in the most southerly situated three pivot lands of the southern development portion of the proposed project associated with the CBA 2 being left in situ and therefore not being significantly impacted upon, the significant presence of nationally protected tree species and the presence of the critically endangered African white-backed vulture habitat within Alternative 2 will still pose a significant residual impact. The two most southerly situated pivot lands of Alternative 2 are also associated with the CBA 2 but due to their significant distance away from the Riet River, these two pivot lands are not necessarily regarded as forming an integral part of the ecological corridor associated with the Riet River catchment and riparian zone relative to the three most southerly situated pivot lands.

By application of the NEMA Mitigation Hierarchy, the significance of residual impacts cannot be adequately mitigated to within acceptable levels other than investigating the potential implementation of an ecological offset as mitigation. The only potentially suitable mitigation option would be for the applicant to make available a suitable ecological offset area which can be formally protected in order to compensate for the significant destruction of the CBA 2, nationally protected tree species and nesting sites and foraging grounds of the critically endangered species.

It is recommended that Alternative 2 be considered due to the smaller impact footprint. If Alternative 2 is considered, the applicant must make available a suitable ecological offset area which can be formally protected in order to compensate for the transformation of the proposed project area. A comprehensive Offset Feasibility Assessment and Report will have to be conducted and compiled in order to identify and inform on an area of suitable size and ecological value which could meaningfully contribute to the regional and provincial biodiversity management requirements and strategies. The proposed Offset Feasibility Assessment and Report will have to be evaluated by the relevant departments in order to inform on their approval/rejection process

11.2 PRELIMINARY ENVIRONMENTAL IMPACT STATEMENT

The key findings of the Impact Assessment phase can be summarised as follows:

The Receiving Environment

The surrounding area is mainly characterised by farming activities and natural veld. The proposed project area is of ecological significance due to the presence of nationally and provincially protected species. The proposed project area is currently regarded as being of little economic or heritage significance/value according to the results of the various specialist reports. **The proposed project also poses significant potential local socio-economic benefits which, according to the EAP, may outweigh the potential negative impacts.**

Public Participation

To support public interest and inform the Scoping & EIA process, a continual public consultation process was undertaken throughout the duration of the assessment processes. A diverse mix of authorities, stakeholders and I & AP's was consulted during this time, representing the environment, social, economic and political sectors of local, regional and provincial bodies.

Comments was responded to during various stages of the public participation process in the Scoping & EIA phases and was formally addressed in project reports. It is considered that through the public participation conducted by the EAP, all relevant parties had adequate opportunity to partake in this process and express opinions and concerns. All relevant concerns were adequately addressed to ensure that all parties are in agreement with the proposed project.

12. CONCLUSION

In conclusion, there are a number of ecologically and avifaunal significant issues to be addressed in the proposed project (mainly protected species management). **These ecological and avifaunal impacts can be regarded as "red-flag" impacts**.

It is in the opinion of the EAP that, by application of the NEMA Mitigation Hierarchy, the significance of residual impacts associated with transformation of the CBA 2 and destruction of nationally protected tree species and critically endangered bird species habitat cannot be suitably reduced and mitigated to within acceptable levels for Alternative 1. This must therefore be seen as a fatal flaw for the proposed Alternative 1 and it is therefore not recommended that Alternative 1 be considered.

Although Alternative 2 will result in the most southerly situated three pivot lands of the southern development portion of the proposed project associated with the CBA 2 being left in situ and therefore not being significantly impacted upon, the significant presence of nationally protected tree species and the presence of the critically endangered African white-backed vulture habitat within Alternative 2 will still pose a significant residual impact. The two most southerly situated pivot lands of Alternative 2 are also associated with the CBA 2 but due to their significant distance away from the Riet River, these two pivot lands are not necessarily regarded as forming an integral part of the ecological corridor associated with the Riet River catchment and riparian zone relative to the three most southerly situated pivot lands.

By application of the NEMA Mitigation Hierarchy, the significance of residual impacts cannot be adequately mitigated to within acceptable levels other than investigating the potential implementation of an ecological offset as mitigation. The only potentially suitable mitigation option would be for the applicant to make available a suitable ecological offset area which can be formally protected in order to compensate for the significant destruction of the CBA 2, nationally protected tree species and nesting sites and foraging grounds of the critically endangered species.

It is recommended that Alternative 2 be considered due to the smaller impact footprint. If Alternative 2 is considered, the applicant must make available a suitable ecological offset area which can be formally protected in order to compensate for the transformation of the proposed project area. A comprehensive Offset Feasibility Assessment and Report will have to be conducted and compiled in order to identify and inform on an area of suitable size and ecological value which could meaningfully contribute to the regional and provincial biodiversity management requirements and strategies. The proposed Offset Feasibility Assessment and Report will have to be evaluated by the relevant departments in order to inform on their approval/rejection process

In the opinion of the EAP, the declaration and management of the identified properties as a Nature Reserve or Protected Environment in accordance with the NEMPAA requirements, satisfy the offset requirement for the proposed development and remedy their significant residual ecological impacts. The proposed developments should therefore be considered by the competent authority for environmental authorisation and approval.

If the Environmental Authorisations for the proposed development is approved, it is recommended that an official offset agreement negotiation meeting between the applicant and state conservation authority be conducted as soon as practicably possible. The objective of this meeting must be to finalise the offset agreement and obtain the applicant's consent and intent to declare a Nature Reserve or Protected Environment in terms of the NEMPAA. A number of recommendations are made for conditions to be included in the Environmental Authorisation; some of these conditions would be suspensive, depending on requirements being met before any listed activities could commence.

A period of 30 days was made available for public comment on the draft Impact Assessment Report. The availability of the draft Impact Assessment Report was announced through the placing of hardcopies at different locations, email correspondence and hard copy delivery to relevant stakeholders and organs of state. In addition, hardcopies of the report were made available at the Siyancuma local Municipality. A downloadable version is available on the Eco-Con Environmental website: http://www.eco-con.co.za/projects/ under the name Zulani Agricultural Development.

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