

# DRAFT ENVIRONMENTAL IMPACT REPORT

**Proposed cultivation of 34 ha virgin soil for the  
establishment of one (1) Lucerne and Maize Farming  
Pivot and on the Farm Doorns No. 131 near Ritchie,  
Northern Cape Province**

**DENC Ref.: NC/EIA/13/FB/SOL/RIT1/2018**

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## EXECUTIVE SUMMARY

The company Sorgvry Landgoed BK is proposing to commence with the process of procuring portion 34 of the Farm Doorns No. 131 near the town of Ritchie in the Northern Cape Province (80 ha). The reason for the intended procurement is for establishing a single (1) 34 ha maize and lucern farming pivot on the farm of natural previously uncultivated land. The majority of the assessment area is situated on a historic centre pivot land footprint whilst only the north-eastern portion is situated on natural virgin soil. An irrigation pipeline required for the centre pivot land, will tie into the existing pump and piping network which is used for irrigation of other centre pivot lands in the area. The existing piping network extracts water from the Riet River which is situated approximately 1.2 km south of the assessment area.

Eco-Con Environmental (Pty) Ltd. was appointed by Sorgvry Landgoed BK 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
<b>GN. R. 984 Listing Notice 2</b>	<p><b>Activity 15</b></p> <p>The clearance of an area of 20 hectares or more of indigenous vegetation.</p>	<p>Cultivation and establishment of a single maize and lucern pivot of approximately 34 ha of natural vegetation.</p> <p>The total size of the farm portion to be impacted by the clearance of vegetation is 34 ha.</p>
<b>GN. R. 985 Listing Notice 3</b>	<p><b>Activity 12</b></p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for</p>	<p>The cultivation and establishment of a single maize and lucern pivot of approximately 34 ha of natural vegetation.</p>

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	The total size of the farm portion to be impacted by the clearance of vegetation is 34 ha / 340 000 square metres.

## PROJECT LOCATION

The proposed project area is approximately 34 ha in surface size and is situated on the Remaining extent of Farm Doorns 131 (SG 21 Digit Code: C0370000000131000034) extending approximately 386 ha. The farm is located approximately 800 m west of the town of Ritchie. The property falls inside the Sol Plaatje Local Municipality which, in turn, forms part of the greater Frances Baard District Municipality. Access to the proposed project area is obtained by way of the N 12 national road and subsequent dirt road from the south-east.

## 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 Northern Cape province of South Africa can be described as a large dry region with similar weather patterns to those in desert and semi-desert areas. This poses various difficulties for crop farmers since they are dependent on rain in order to ensure sufficient moisture for their crops and a subsequent good harvest. The remaining area of the Farm Doorns 131 is currently of little economic value due to these areas not being suitable for irrigation purposes. Should these suitable areas not be developed and efficiently utilised, the economic value will stay low. The development of maize and lucern pivots 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 Sol Plaatje Local Municipality and Frances Baard District Municipality Integrated Development Plans.

## ALTERNATIVES CONSIDERED

### Site / Property Alternatives

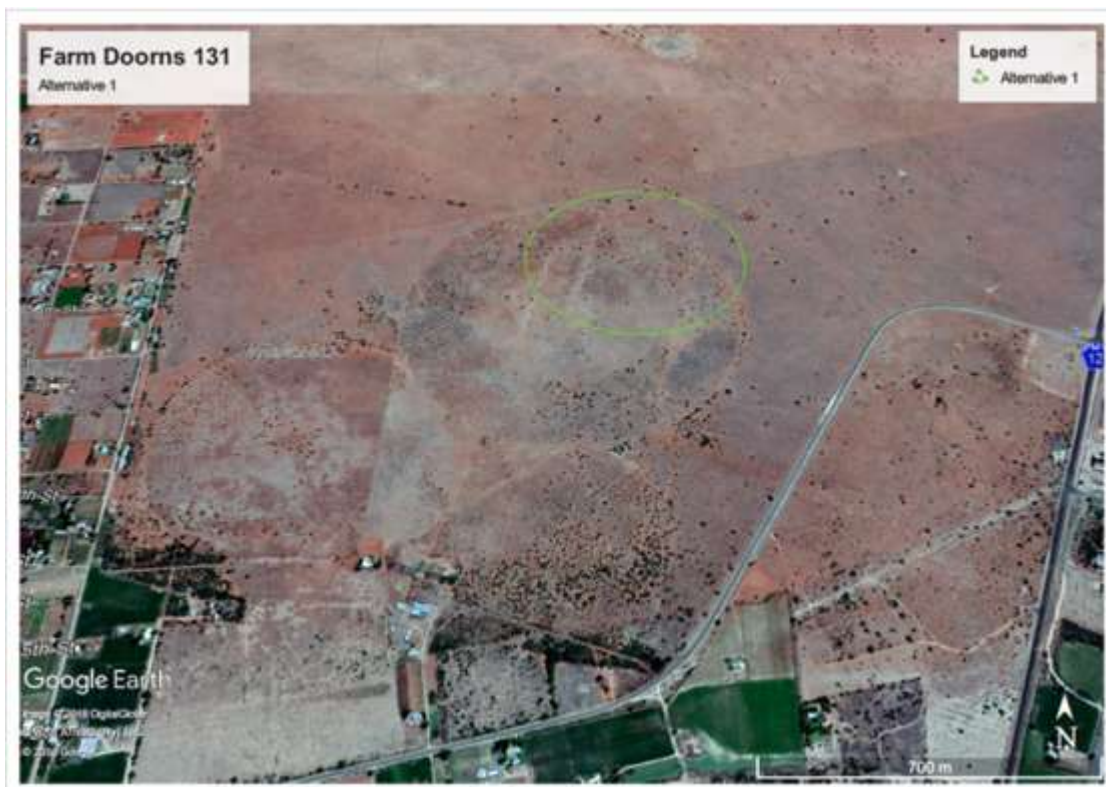
An alternative viable site location was not identified and evaluated for the project. The specific proposed location for said project is preferred as it is the only viable portion of land available in that vicinity which is up for procurement. The landowner and the applicants are not the same person / company and therefore procurements arrangements had to be made.

### Layout Alternatives

During the scoping phase of the project two layout alternatives have been evaluated.

#### Layout Alternative 1 (Preferred Layout Alternative)

The preferred layout alternative includes the development of a single (1) 34 ha maize and lucern pivot. The majority of the pivot will be situated on a historic centre pivot land whilst only 7,57 ha of the newly proposed pivot (north-eastern portion) will be situated on natural virgin soil.



#### ***Doorns Preferred Alternative (Alternative 1)***

### Layout Alternative 2

Layout alternative 2 includes the development of a single (1) 34 ha maize and lucern pivot. Although this newly proposed pivot will also be situated on a historic centre pivot land, a much larger portion of natural virgin soil (18,14 ha) will be disturbed, as compared to alternative 1.



### ***Doorns 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:					
<b>Nature of impact:</b> Direct impact on Flora as a result of vegetation clearance.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	51	24	76	28	14
Significance rating:	Medium (M)	Low (L)	Medium-High (MH)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
Potential Fauna and Avifauna Impacts:					
<b>Nature of impact:</b> Direct impact on Fauna and Avifauna as a result of vegetation clearance.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	51	24	57	28	8
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:					
<b>Nature of impact:</b> Dust nuisance generated during the development / preparation of the pivots.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	48	27	48	27	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)
Potential Noise Impacts:					
<b>Nature of impact:</b> Noise nuisance generated during the development / preparation of the pivots.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
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)
Potential Cultural and Heritage Impacts:					

<b>Nature of impact:</b> Damage and destruction of vertebrate fossils during excavation activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	9	6	9	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Surface and Groundwater Contamination Impacts:</b>					
<b>Nature of impact:</b> Surface and Groundwater Contamination during the development / preparation of the pivots.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	42	20	42	20	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Waste Management Impacts:</b>					
<b>Nature of impact:</b> Waste impacts by means of waste storage and littering during the development / preparation of the pivots.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	24	18	24	18	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Traffic Impacts:</b>					
<b>Nature of impact:</b> Traffic impacts by means of additional truck and transportation to and from site during the development / preparation of the pivots.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	9	6	9	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Fire Risk Impacts:</b>					
<b>Nature of impact:</b> Increase risk of fires during the development / preparation of the pivots.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	

<b>Total SP:</b>	9	6	9	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Soil Contamination Impacts:</b>					
<b>Nature of impact:</b> Increased Soil contamination by means of hazardous substances.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	42	20	42	20	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Soil Erosion Impacts:</b>					
<b>Nature of impact:</b> Increased Soil erosion due to construction activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	5	6	5	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Visual Impacts:</b>					
<b>Nature of impact:</b> Increased visual impact due to increased working activities on-site.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	14	3	14	3	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Socio-Economic Impacts:</b>					
<b>Nature of impact:</b> Increased socio-economic conditions due to job creation			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	52	75	52	75	60
<b>Significance rating:</b>	+ Medium (M)	+ Medium-high (MH)	+ Medium (M)	+ Medium-high (MH)	Medium (M)
<b>Cumulative impact:</b>	+ Medium (M)	+ Medium (M)	+ Medium (M)	+ Medium (M)	Medium (M)



Operational Phase

OPERATIONAL PHASE					
Potential Flora Impacts:					
<b>Nature of impact:</b> Direct impact on Flora as a result of continuous vegetation clearance.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	32	11	57	28	14
Significance rating:	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
Potential Fauna and Avifauna Impacts:					
<b>Nature of impact:</b> Direct impact on Fauna and Avifauna as a result of cleared vegetation / habitat loss.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	42	24	72	28	8
Significance rating:	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
Cumulative impact:	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
Potential Dust Impacts:					
<b>Nature of impact:</b> Dust nuisance generated during the operational phase of the project.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	48	27	48	27	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)
Potential Noise Impacts:					
<b>Nature of impact:</b> Noise nuisance generated during the operational phase of the pivots.				<b>Activity:</b> Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
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)
Potential Cultural and Heritage Impacts:					
<b>Nature of impact:</b>				<b>Activity:</b>	

Damage and destruction of vertebrate fossils during the operational phase of the pivots.				Proposed development of maize and lucern pivot	
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	9	6	9	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Surface and Groundwater Contamination Impacts:</b>					
<b>Nature of impact:</b> Surface and Groundwater Contamination during the operational phase of the pivots.				<b>Activity:</b> Proposed development of maize and lucern pivot	
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	42	20	42	20	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Waste Management Impacts:</b>					
<b>Nature of impact:</b> Waste impacts by means of waste storage and littering during the operational of the pivots.				<b>Activity:</b> Proposed development of maize and lucern pivot	
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	24	18	24	18	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Traffic Impacts:</b>					
<b>Nature of impact:</b> Traffic impacts by means of additional truck and transportation to and from site during the operational phase of the pivots.				<b>Activity:</b> Proposed development of maize and lucern pivot	
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	9	6	9	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Fire Risk Impacts:</b>					
<b>Nature of impact:</b> Increase risk of fires during the operational phase of the pivots.				<b>Activity:</b> Proposed development of maize and lucern pivot	
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	9	6	9	6	4

<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Soil Contamination Impacts:</b>					
<b>Nature of impact:</b> Increased Soil contamination by means of hazardous substances.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	30	9	30	9	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Soil Erosion Impacts:</b>					
<b>Nature of impact:</b> Increased Soil erosion due to operational activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	5	6	5	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Visual Impacts:</b>					
<b>Nature of impact:</b> Increased visual impact due to increased working activities on-site.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	14	3	14	3	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Potential Socio-Economic Impacts:</b>					
<b>Nature of impact:</b> Increased socio-economic conditions due to job creation			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Total SP:</b>	52	75	52	75	60
<b>Significance rating:</b>	+ Medium (M)	+ Medium-high (MH)	+ Medium (M)	+ Medium-high (MH)	Medium (M)
<b>Cumulative impact:</b>	+ Medium (M)	+ Medium (M)	+ Medium (M)	+ Medium (M)	Medium (M)

Decommissioning Phase

DECOMMISSIONING PHASE					
Potential Dust Impacts:					
<b>Nature of impact:</b> Dust nuisance generated during the decommissioning phase of the project.			<b>Activity:</b> Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	48	27	48	27	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)
Potential Surface and Groundwater Contamination Impacts:					
<b>Nature of impact:</b> Surface and Groundwater Contamination during the decommissioning phase by means of fertilizer and/or any other hazardous substances or pesticides.			<b>Activity:</b> Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	24	18	24	18	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)
Potential Soil Contamination Impacts:					
<b>Nature of impact:</b> Increased Soil contamination by means of hazardous substances.			<b>Activity:</b> Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	24	18	24	18	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)
Potential Soil Erosion Impacts:					
<b>Nature of impact:</b> Increased Soil erosion due to decommissioning activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	5	6	5	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)
Potential Socio-Economic Impacts:					
<b>Nature of impact:</b>			<b>Activity:</b>		

Increased socio-economic conditions due to job loss				Proposed development of maize and lucern pivot	
Evaluation Component:	Preferred Layout Alternative		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
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)

## 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

The assessment area is approximately 80 ha in size on which the project applicant proposes to develop a single cultivated centre pivot land of approximately 34 ha in size. The mechanical clearance of vegetation and soil preparation associated with the proposed agricultural development will in all probability completely transform the majority of the existing natural surface vegetation on the assessment area.

No Red Data Listed, provincially- or nationally protected or any other species of conservational significance were found to be present within the entire historic centre pivot land footprint. It must however be noted that the time of the assessment was not necessarily favourable for successful identification of all plant species individuals.

The woody component of the north-eastern portion of the assessment area is mainly dominated by tree and shrub individuals of the nationally protected species *Vachellia erioloba*. Approximately 53 individuals of this species are present of which 7 are large mature individuals ( $\geq 7$  m in height) with broad tree canopies. These broad tree canopies house significant numbers of Cape Sparrow (*Passer melanurus*) nests and possibly also Great Sparrow (*Passer motitensis*) nests, which is provincially a protected species. Two individuals of the provincially protected forb species *Boophone disticha* and a single individual of the provincially specially protected species *Harpagophytum* sp. were also found to be present within the north-eastern portion of the assessment area. It is however highly likely that there could be more individuals of these species present. It is therefore recommended that an additional ecological walkthrough of the final development footprint area be conducted prior to commencement of the project during the flowering period of underground bulb plant species. This will ensure that no provincially protected or significant species have potentially been omitted.

The historic centre pivot land footprint is not necessarily viewed as being of high conversational significance, while the north-eastern portion of the assessment area is viewed as being of moderate conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type and nationally/provincially protected species. It is therefore recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint and be kept away from the north-eastern portion of the assessment area.

Due to the flat topography of the broader landscape, no significant watercourses or water drainage lines are present within the assessment area. The ecological connectivity between the assessment area and the Riet River situated approximately 1.2 km south is also virtually cut off by the existing road networks, residential and other agricultural developments.

It is the opinion of the specialist that the potentially significant ecological impacts associated with the transformation of the CBA 2, destruction of-/damage to Red Data Listed, nationally or provincially protected species individuals/habitats associated with the assessment area, terrestrial alien invasive species establishment, alteration/contamination of soil and groundwater characteristics/quality and potential over-extraction of irrigation water from the Riet River, can be suitably reduced and mitigated to within acceptable residual levels if the recommended Alternative 1 is developed. The project should therefore be considered by the competent authority for environmental authorisation and approval. The potential ecological impacts associated with Alternative 2 will however be significantly higher than those of Alternative 1 and it is therefore not recommended that Alternative 2 be considered for development.

#### Heritage Specialist study

The report is a Phase 1 assessment of potential palaeontological and archaeological impact with regard to the proposed development of a 34 ha irrigation pivot on portion 34 of the Farm Doorns No. 131 near the town of Ritchie in the Northern Cape Province. The majority of the assessment area is situated on an existing centre pivot footprint whilst only the north-eastern portion is situated on natural virgin soil. An irrigation pipeline required for the centre pivot land, will tie into the existing pump and piping network which is used for irrigation of other centre pivot lands in the area.

The heritage significance of the affected area was evaluated through a desktop study and carried out on the basis of existing field data, database information, published literature and maps. This was followed up with a field assessment by means of a pedestrian survey and investigation of all exposed sections within the footprint. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes.

Site significance classification standards prescribed by SAHRA (2005) were used to indicate overall significance and mitigation procedures where relevant. There were no limitations or restrictions with regard to access to the site.

The proposed development footprint is very small and will primarily impact on severely disturbed terrain (existing pivot and associated agricultural land) capped and buffered by well developed Quaternary aeolian sand on low relief terrain. There is no evidence of *in situ* Stone Age archaeological material, rock art, prehistoric structures, graves or historically significant structures older than 60 years within the demarcated footprint.

Very little possibility exists that objects of palaeontological, archaeological or historical significance may be uncovered during the course of the proposed development. Given the scale and location of the proposed development the site is not considered palaeontologically or archaeologically vulnerable and is assigned a site rating of Generally Protected C.

#### Soil Suitability Study

The soil distribution is very varied on this site, as evidenced through the nine soil forms present. The Plooyburg soil form was the most frequently observed and is a red sandy non-calcareous material overlying a carbonate layer which has precipitated to the point of hardening. The Hutton and Bainsvlei soil forms, which were observed 13 times and once respectively, are similar to the Plooyburg soil form, with the exception that it overlies hard rock and soft plinthite rather than hardpan carbonate. The suitability of these three soil forms for irrigation is dependent on the depth of the red sandy material. The Addo, Augrabies and Brandvlei soil forms are similar in that they are largely calcareous. For the Addo and Brandvlei soil forms, the horizons directly under the top soils do not display a morphology dominated by lime accumulation (i.e. you cannot see the lime), whereas this is the case with the Brandvlei soil form. The Addo and Augrabies differ in that the Addo does contain a soft carbonate horizon deeper in the profile, while the Augrabies does not. The suitability for irrigation of the calcareous soil horizons is indicated by the laboratory analysis, as they often contain high amounts of salts, precipitated due to impermeability. Lastly, the Mispah, Glenrosa and Coega soil forms are shallow soils, with the Mispah being underlain by hard rock, the Glenrosa by cracked rock and the Coega with hardpan carbonate.

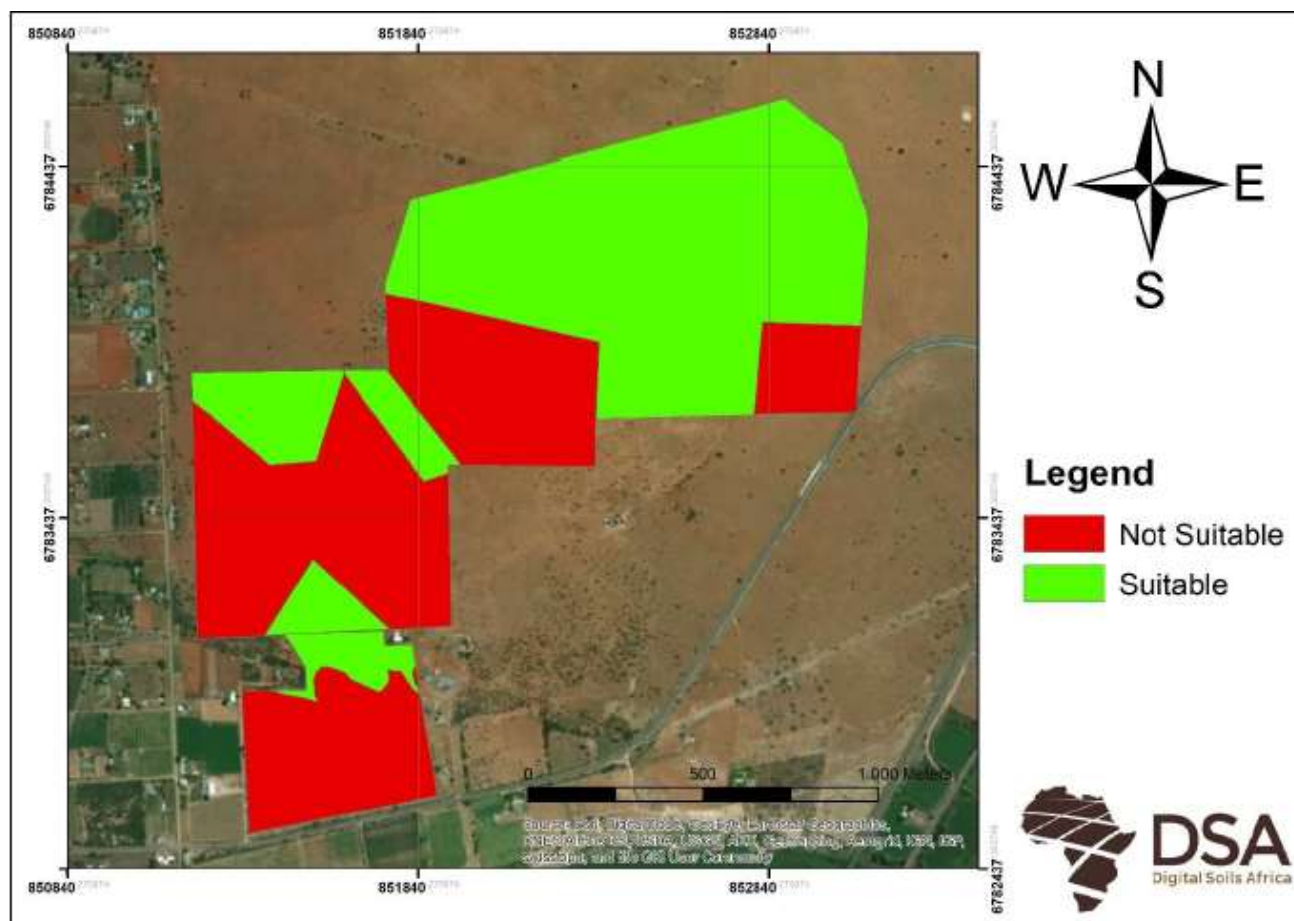
On the Remaining Extent of the Farm Doorns No. 131, the Hutton soil form covers the largest part of the site, but gives way to Plooyburg, Addo and Prieska soils in the south. Small parts of the Prieska and Plooyburg soil forms are also present near the middle of the site.

The freely drainable depth is the depth up to where the water can freely drain. It includes the depth of the apedal B, neocarbonate B and lithocutanic B horizons. This is the depth above the pedocutanic B, hardpan

carbonate, hard rock, unspecified material with signs of wetness and soft plinthic horizons. Similar to the soil forms, the soil depth varies considerably throughout the three sites. Generally, the soils are shallow to moderately deep, becoming deeper to the north east. Some shallower areas are scattered throughout the sites.

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 Doorns**

## CONCLUSION

In conclusion, there are a number of potential ecological and significant flora issues to be addressed in the proposed project (mainly protected species management). It is therefore the recommendation of the EAP that these impacts are carefully evaluated

It is the opinion of the EAP that the potentially significant ecological impacts associated with the transformation of the CBA 2, destruction of-/damage to Red Data Listed, nationally or provincially protected species individuals/habitats associated with the assessment area, terrestrial alien invasive species establishment, alteration/contamination of soil and groundwater characteristics/quality can be suitably reduced and mitigated to within acceptable residual levels if the recommended Alternative 1 is developed.

This is due to the fact that if Alternative 1 is developed, only 7,57 ha of the newly proposed pivot (north-eastern portion) will be situated on natural virgin soil, whilst Alternative 2 will disturb 18,14 ha of natural virgin soil.

Due to the flat topography of the broader landscape, no significant watercourses or water drainage lines are present within the assessment area. The ecological connectivity between the assessment area and the Riet

River situated approximately 1.2 km south is also virtually cut off by the existing road networks, residential and other agricultural developments. This significantly lowers the potential for soil and subsequent water contamination.

Since the historic centre pivot land footprint is completely dominated/infested by the legally declared invasive species *Prosopis spp.* (Category 3) and the legally declared invasive species *Argemone mexicana* (Category 1b) is also sparsely scattered throughout the area, these individuals will need to be removed during the construction phase which will prove to be beneficial to the environment. In order to ensure legislative compliance, disturbed areas should be adequately rehabilitated and alien invasive species which may establish on the assessment area during the construction and operational phases, need to be sufficiently managed in accordance with the requirements of the legal categories into which they fall. Adequate planning and a structured, systematic approach to alien invasive species management forms a crucial aspect in ensuring the success of the process. Poor planning can significantly increase the cost involved as well as negatively impact on the desired success of the process. It is therefore imperative that a structured and practically implementable management plan be followed. As a result of this, a Rehabilitation and Alien Invasive Species Management Plan has already been compiled.

The development of Alternative 1, will require the removal and relocation and relocation of one (1) of the provincially protected species *Boophone disticha* as well as the removal/destruction of nineteen (19) individuals of the nationally protected species *Vachellia erioloba*. As a result of this, a Protected Species Relocation Management Plan has already been compiled.

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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 <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	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 Sorgvry Landgoed BK is proposing to commence with the process of procuring portion 34 of the Farm Doorns No. 131 near the town of Ritchie in the Northern Cape Province (80 ha). The reason for the intended procurement is for establishing a single (1) 34 ha maize and lucern farming pivot on the farm of natural previously uncultivated land. The majority of the assessment area is situated on a historic centre pivot land footprint whilst only the north-eastern portion is situated on natural virgin soil. An irrigation pipeline required for the centre pivot land, will tie into the existing pump and piping network which is used for irrigation of other centre pivot lands in the area. The existing piping network extracts water from the Riet River which is situated approximately 1.2 km south of the assessment area.

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 lucern and maize (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**

<b>Company/entity name:</b>	Sorgvry Landgoed BK
<b>Registration number:</b>	1994/030794/23
<b>Physical address:</b>	Perseel A41, Rietrivier, 8301
<b>Postal address:</b>	Box 11007, Hadison Park, 8306
<b>Contact person:</b>	Mr. Aubrey Robinson
<b>ID number:</b>	5912165103087
<b>Designation:</b>	Director
<b>Contact number:</b>	083 448 9054
<b>E-mail address:</b>	actruck@mweb.co.za

## 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 where 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 000m<sup>2</sup> 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 maize and lucern pivot will 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 Frances Baard 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**

“To be a municipality with a clear development focus to improve the quality of life of all communities in the district”.



**Mission**

“To promote the quality of services and thereby improving the standard of living of all its communities by:

- Promoting social and economic development.
- Promoting the provision of sustainable, affordable and optimal quality of service.
- Utilizing all available resources economically, efficiently and effectively.
- Effective community participation of all stakeholders”.

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 Sol Plaatje Local Municipality Integrated Development Plan 2017/2022**

The following vision and mission is engrained into the Integrated Development Plan (IDP) of the Sol Plaatje Local Municipality

**Vision**

“Towards a leading and modern city”. This vision will in turn fulfil our mandate which is informed by the following key strategic objectives:

- Spatial Transformation
- Inclusive Growth
- Service Provision
- Governance

**Mission**

The following will guide the municipality over the five year term:

- Togetherness: there is no separation between Sol Plaatje municipality and community, we are intertwined
- Certainty: there is a clear plan of reaching out to every community in Sol Plaatje municipal area
- Availability: the services are available at different levels, everywhere
- Responsive: we will be innovative and embrace technology as means of communication

- Appreciative: we are best placed in Sol Plaatje, and we choose to be here
- Relentlessness: we work, we serve, we do our best
- Legacy: we create heritage through legacy
- Ethical work: we will work in an ethical manner to be efficient, effective and ensure value for money
- Respect: we are family

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**

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

### 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
<p><b>GN. R. 984 Listing Notice 2</b></p>	<p><b>Activity 15</b></p> <p>The clearance of an area of 20 hectares or more of indigenous vegetation.</p>	<p>Cultivation and establishment of a single maize and lucern pivot of approximately 34 ha of natural vegetation.</p> <p>The total size of the farm portion to be impacted by the clearance of vegetation is 34 ha.</p>
<p><b>GN. R. 985 Listing Notice 3</b></p>	<p><b>Activity 12</b></p> <p>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.</p> <p>(G) In Northern Cape:</p> <p>(ii) Within critical biodiversity areas identified in bioregional plans</p>	<p>The cultivation and establishment of a single maize and lucern pivot of approximately 34 ha of natural vegetation.</p> <p>The total size of the farm portion to be impacted by the clearance of vegetation is 34 ha / 340 000 square metres.</p>

### 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**

<b>EIA Regulations 2017 - Appendix 3 – Scope of assessment and content of environmental impact assessment reports</b>	<b>Location in this document</b>
(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 34 ha in surface size and is situated on the portion 34 of the Farm Doorns 131 (SG 21 Digit Code: C03700000000013100000) extending approximately 386 ha. An irrigation pipeline required for the centre pivot land, will tie into the existing pump and piping network which is used for irrigation of other centre pivot lands in the area. The existing piping network extracts water from the Riet River which is situated approximately 1.2 km south of the assessment area. The farm is located approximately 800m outside the town of Ritchie towards Kimberley. The property is in the name of Mr. AC Redelinghuys. As a result, consent is required from Mr. Redelinghuys as Mr. AJ Robinson, director of Sorgvry Landgoed BK t/a AC Truck, is not the land owner.

The property falls inside Sol Plaatjie Local Municipality which, in turn, forms part of the greater Frances Baard District Municipality. Access to the assessment area is obtained via the N 12 national rad and subsequent dirt road from the south-east.

See locality map below.



Figure 1: Locality Map



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

Farm Name and Number	SG 21 Digit Code	Land owner
Portion 34 of Farm Doorns 131	C03700000000013100000	Mr. AC Redelinghuys

(See Appendix F for the title deeds)

Title deed number for the Remaining extent of Farm Doorns 131: 1933-2016

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

- North-western corner 29°01'14.55"S; 24°36'43.73"E
- North-eastern corner 29°01'03.45"S; 24° 37'24.78"E
- South-eastern corner 29°01'32.55"S; 24°37'16.10"E
- South-western corner 29°01'33.62"S; 24°36'59.45"E

The coordinate points for the existing as well new pipeline and pump station are as follows:

- Pump station 29°02'18.46"S; 24°36'50.85"E
- Existing pipeline start point 29°02'18.46"S; 24°36'50.85"E
- Existing pipeline deviation point 1 29°02'10.46"S; 24°36'49.62"E
- Existing pipeline end point 29°02'05.06"S; 24°36'36.43"E
- New pipeline start point 29°02'08.57"S; 24°36'45.32"E
- New pipeline deviation point 1 29°01'55.23"S; 24°36'42.41"E
- New pipeline end point 29°01'19.83"S; 24°37'04.44"E

The centre point of the **Alternative 1** pivot are as follows:

34 hectare Pivot:

29°01'20.89"S; 24°37'06.28"E

The centre point of the **Alternative 2** pivot are as follows:

34 hectare Pivot:

29°01'17.73"S; 24°37'13.52"E

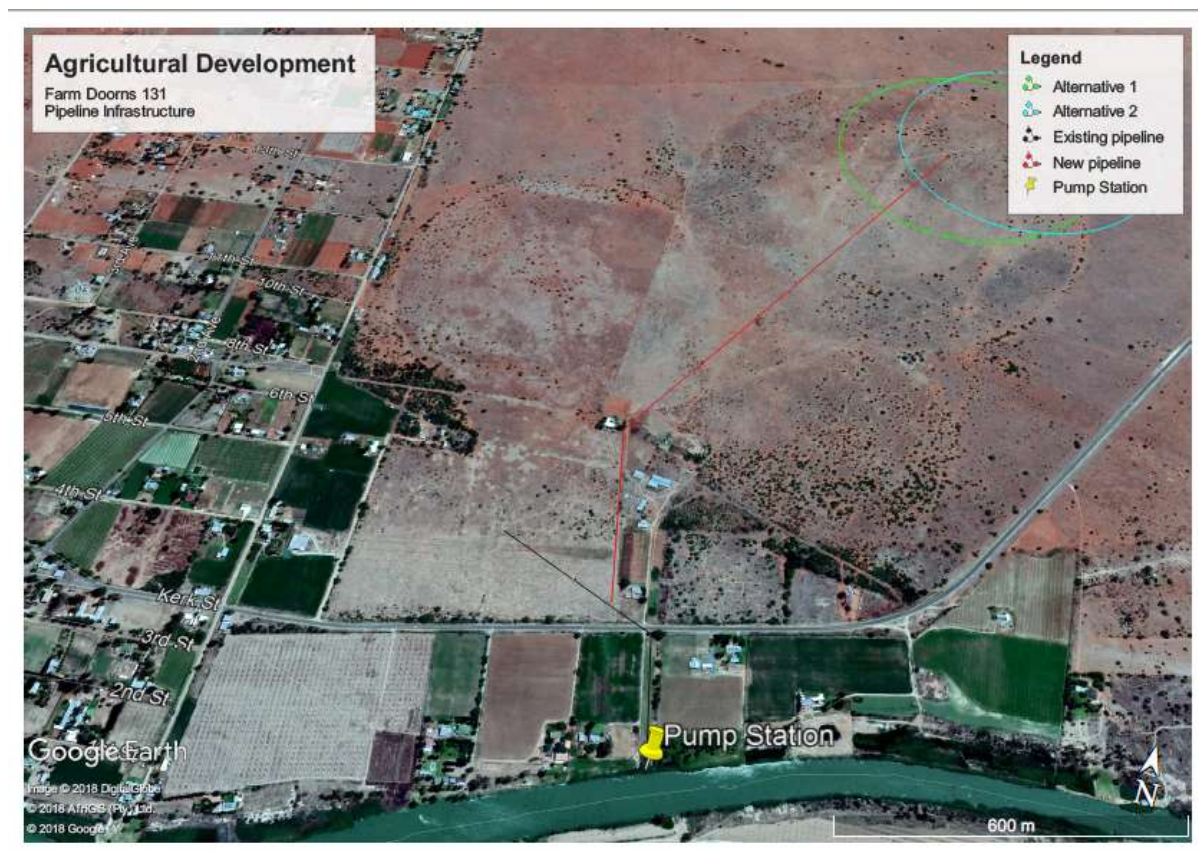


Figure 2: Pipeline Infrastructure

Table 7: Details of relevant land owner

<b>Company/entity name:</b>	Sorgvry Landgoed BK
<b>Postal address:</b>	Box 11007, Hadison Park, 8306
<b>Contact person:</b>	Mr. Aubrey Robinson
<b>Designation:</b>	Director
<b>Contact number:</b>	083 448 9054
<b>E-mail address:</b>	actruck@mweb.co.za

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 3: Image visually illustrating the general vegetation cover*



*Figure 4: Image visually illustrating the general vegetation cover*





## 4.2 PROJECT DESCRIPTION

The company Sorgvry Landgoed BK is proposing to commence with the process of procuring portion 34 of the Farm Doorns No. 131 near the town of Ritchie in the Northern Cape Province (80 ha). The reason for the intended procurement is for establishing a single (1) 34 ha maize and lucern farming pivot on the farm of natural previously uncultivated land. The majority of the assessment area is situated on a historic centre pivot land footprint whilst only the north-eastern portion is situated on natural virgin soil. An irrigation pipeline required for the centre pivot land, will tie into the existing pump and piping network which is used for irrigation of other centre pivot lands in the area. The existing piping network extracts water from the Riet River which is situated approximately 1.2 km south of the assessment area.

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

### **Site / Property Alternatives**

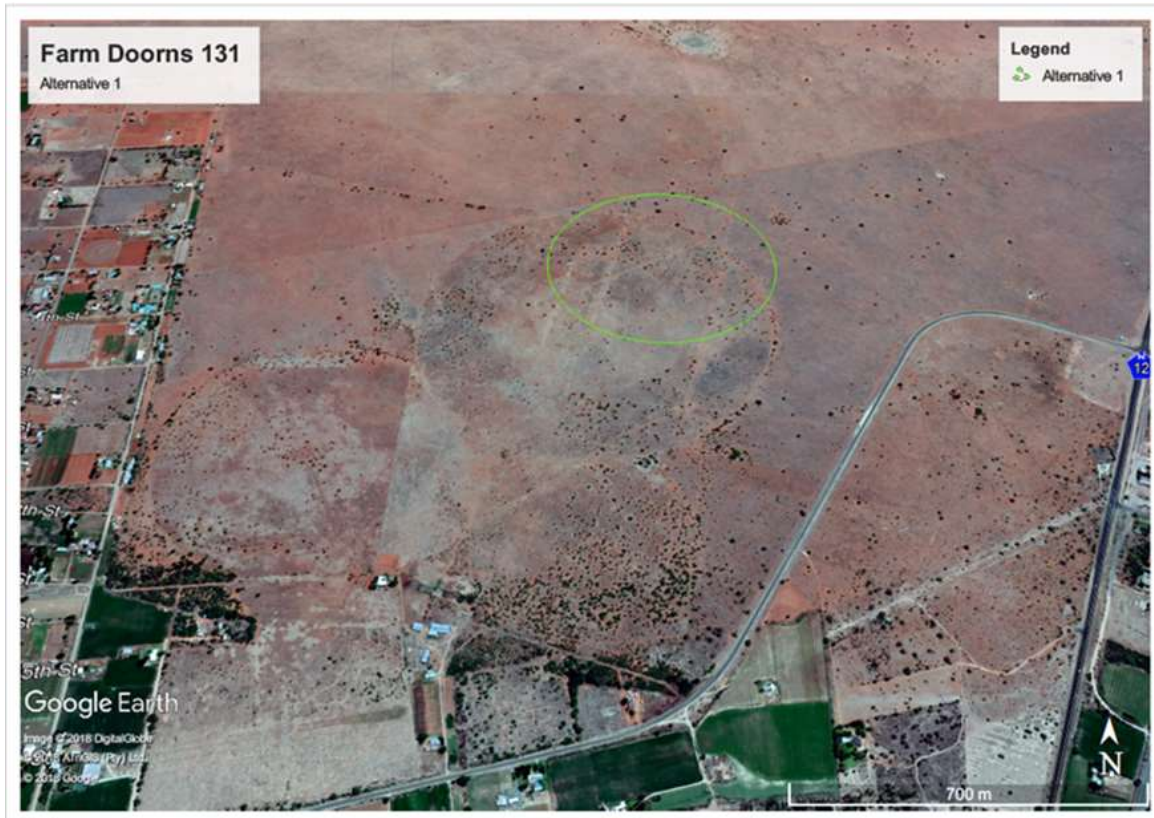
An alternative viable site location was not identified and evaluated for the project. The specific proposed location for the maize and lucern pivot are preferred as it is the only viable portion of land available in that vicinity which is up for procurement. Procurements arrangements have been made between the applicant and the current land owner. The portion is also situated in close proximity to the Riet river from where water will be lawfully obtained for irrigation after a Water Use Licence has been obtained. This will render the project viable from an economic and logistic perspective.

### **Layout Alternatives**

Two maize and lucern pivot layout alternatives have been considered. These alternatives are described below:

#### **Layout Alternative 1 (Preferred Alternative)**

The preferred layout alternative includes the development of a single (a single) 34 ha maize and lucern pivot. The majority of the pivot will be situated on a historic centre pivot land whilst only 7,57 ha of the newly proposed pivot (north-eastern portion) will be situated on natural virgin soil.



**Figure 6: Doorns Alternative 1 (Preferred Alternative)**

Layout Alternative 2

Layout alternative 2 includes the development of a single (a single) 34 ha maize and lucern pivot. Although this newly proposed pivot will also be situated on a historic centre pivot land, a much larger portion of natural virgin soil (18,14 ha) will be disturbed, as compared to alternative 1.



**Figure 7: Doorns Alternative 2**

The project will entail two major aspects namely:

- Cultivation of 34 ha maize and lucern pivot.
- Establishment of an irrigation pipeline.

#### **4.2.1 Cultivation of 34 ha maize and lucern pivot.**

A single 34 ha pivot will be established on the proposed project. The majority of the assessment area is situated on a historic centre pivot land footprint while only the north-eastern portion is situated on natural virgin soil.

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 pivot, 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 once the Water Use Licence Application has been lodged and environmental authorisation has been obtained.
  - Information obtained from the applicant states that 275 000 m<sup>3</sup> of water will be required for per year for the cultivation of either maize or lucern.
- Planting of maize and Lucerne will be conducted mechanically.

#### **4.2.2 Establishment of an irrigation pipeline**

An irrigation pipeline required for the centre pivot land, will tie into the existing pump and piping network which is used for irrigation of other centre pivot lands in the area. Some of the already established piping infrastructure will be moved to create the new pipeline which will transport water from the extraction point in the Riet river to the newly proposed development area.

#### **4.2.3 Project Description Summary**

The development will constitute a total footprint area of approximately 34 ha as indicated on the locality map. The majority of the assessment area is situated on a historic centre pivot land footprint whilst only the north-eastern portion is situated on natural virgin soil. An irrigation pipeline will tie into the existing pump and piping network.

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 for the pump will be obtained from an Eskom power point (100kva transformer). The extraction pump for the proposed development is already in place. This was done for previous developments. The applicant now will only tie into the existing line. Thus, no new extraction pump will be installed.

#### **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 contractor 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. once the Water Use Licence Application has been lodged and environmental authorisation has been obtained.

## **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:

With the exponential increase in human populations, the need for food is also increasing. It is thus of vital importance to increase the productivity of each hectare of land for crop production in order to meet this increasing demand. Natural veld on its own will not be able to fulfil this need, unless supplemented with additional irrigation.

The Northern Cape province of South Africa can be described as a large dry region with similar weather to desert and semi-desert areas. The average rainfall of the Ritchie is approximately 453 mm per year ([www.climate-data.org](http://www.climate-data.org)). The maximum average monthly temperature is approximately 24.6°C in the summer months while the minimum average monthly temperature is approximately 9.1°C during the winter. Maximum daily temperatures can reach up to 32.6°C in the summer months and dip to as low as -0.2°C during the winter.

### **5.1 CLIMATIC REQUIREMENTS OF MAIZE AND LUCERN:**

The current irrigation guidelines, states the water requirements, during a growing season for maize as 500 – 800 mm and 1 200 mm for lucerne. When taking into account the climate of Ritchie as well as the amount of water required by forage crops for successful establishment, it can be concluded that additional water will need to be provided to these crops in order to ensure successful establishment and a high yield. This will then in turn aid in increasing the food security of the country.

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 FAVOURABLE LOCATION:**

The farm Doorns 131 on which the proposed development is to take place, is conveniently situated in close proximity (approximately 1,2 km) to the Riet river from where water will be extracted once a Water Use Licence has been obtained.

## 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 **location** 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 maize and lucern 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

An alternative viable site location was not identified and evaluated for the project. The specific proposed location for the maize and lucern pivot are preferred as it is the only viable portion of land available in that vicinity which is up for procurement. Procurements arrangements have been made between the applicant and the current land owner. The portion is also situated in close proximity to the Riet river from where water will be lawfully obtained for irrigation after a Water Use Licence has been obtained. This will render the project viable from an economic and logistic perspective.

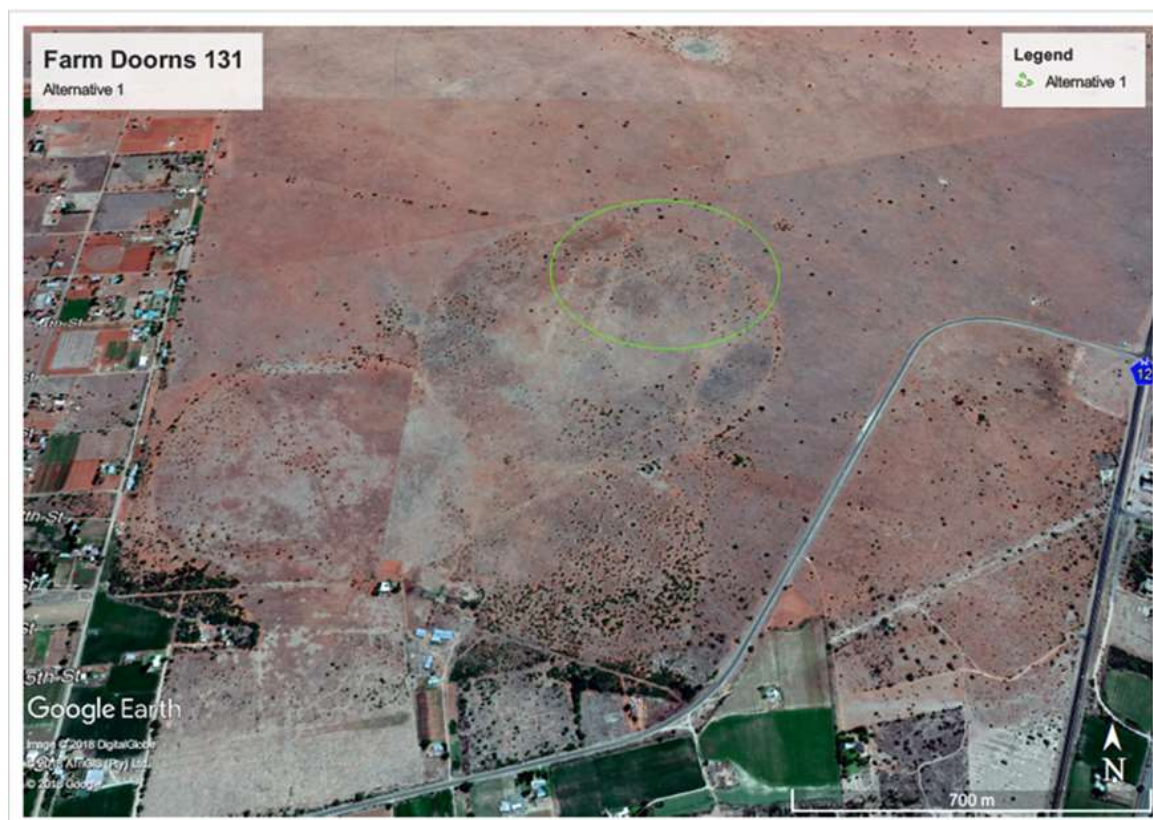
## 6.2 LAYOUT ALTERNATIVES

Two maize and lucern pivot layout alternatives have been considered. These alternatives are described below:

In order to achieve the above, two Layout Alternatives are proposed:

### Layout Alternative 1 (Preferred Alternative)

The preferred layout alternative includes the development of a single (a single) 34 ha maize and lucern pivot. The majority of the pivot will be situated on a historic centre pivot land whilst only 7,57 ha of the newly proposed pivot (north-eastern portion) will be situated on natural virgin soil.



### **Doorns Alternative 1 (Preferred Alternative)**

### Layout Alternative 2

Layout alternative 2 includes the development of a single (a single) 34 ha maize and lucern pivot. Although this newly proposed pivot will also be situated on a historic centre pivot land, a much larger portion of natural virgin soil (18,14 ha) will be disturbed, as compared to alternative 1.



### **Doorns 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 10 will be avoided if the proposed project is not implemented. The proposed project will contribute to local job creation by means of the appointment of approximately 16 staff. The low crop production capacity of the current land will be changed and developed which will have a positive influence on local economic growth.

##### **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.

## 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 8: List of Specialist Studies Conducted**

Specialist Name	Organisation	Specialist Assessment Type
Mr. Rikus Lamprecht	EcoFokus	Ecological and Wetland Impact Assessment
Mr. Rikus Lamprecht	EcoFokus	Rehabilitation and Alien Invasive Species Management Plan
Mr. Rikus Lamprecht	EcoFokus	Protected Species Relocation Management Plan
Dr. Lloyd Rossouw	Palaeo Field Services	Archaeological and Palaeontological Impact Assessment (Heritage Assessment)
Dr. George van Zijl	Digital Soils Africa	Soil Suitability 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 453 mm ([www.climate-data.org](http://www.climate-data.org)). The maximum average monthly temperature is approximately 24.6°C in the summer months while the minimum average monthly temperature is approximately 9.1°C during the winter. Maximum daily temperatures can reach up to 32.6°C in the summer months and dip to as low as -0.2°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.

### **7.1.3 Topography**

The broader landscape of the proposed project area is mainly characterised by a flat topography. 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. There are thus no significant watercourses or water drainage lines present within the assessment area. The ecological connectivity between the assessment area and the Riet River situated approximately 1.2 km south is also virtually cut off by the existing road networks, residential and other agricultural developments.

### **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 assessment 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 entire assessment area is categorised as a Critical Biodiversity Area two (CBA 2) in accordance with the Northern Cape Provincial Spatial Biodiversity Plan 2016 (NCPSBP), which sets out biodiversity priority areas in the province. Critical Biodiversity Areas are areas that are irreplaceable or near-irreplaceable (CBA 1), or reflect an optimum configuration (CBA 2) for reaching 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 mechanical clearance of vegetation and soil preparation associated with the proposed agricultural development will in all probability completely transform the majority of the existing natural surface vegetation on the assessment area.

See vegetation and sensitivity maps below.

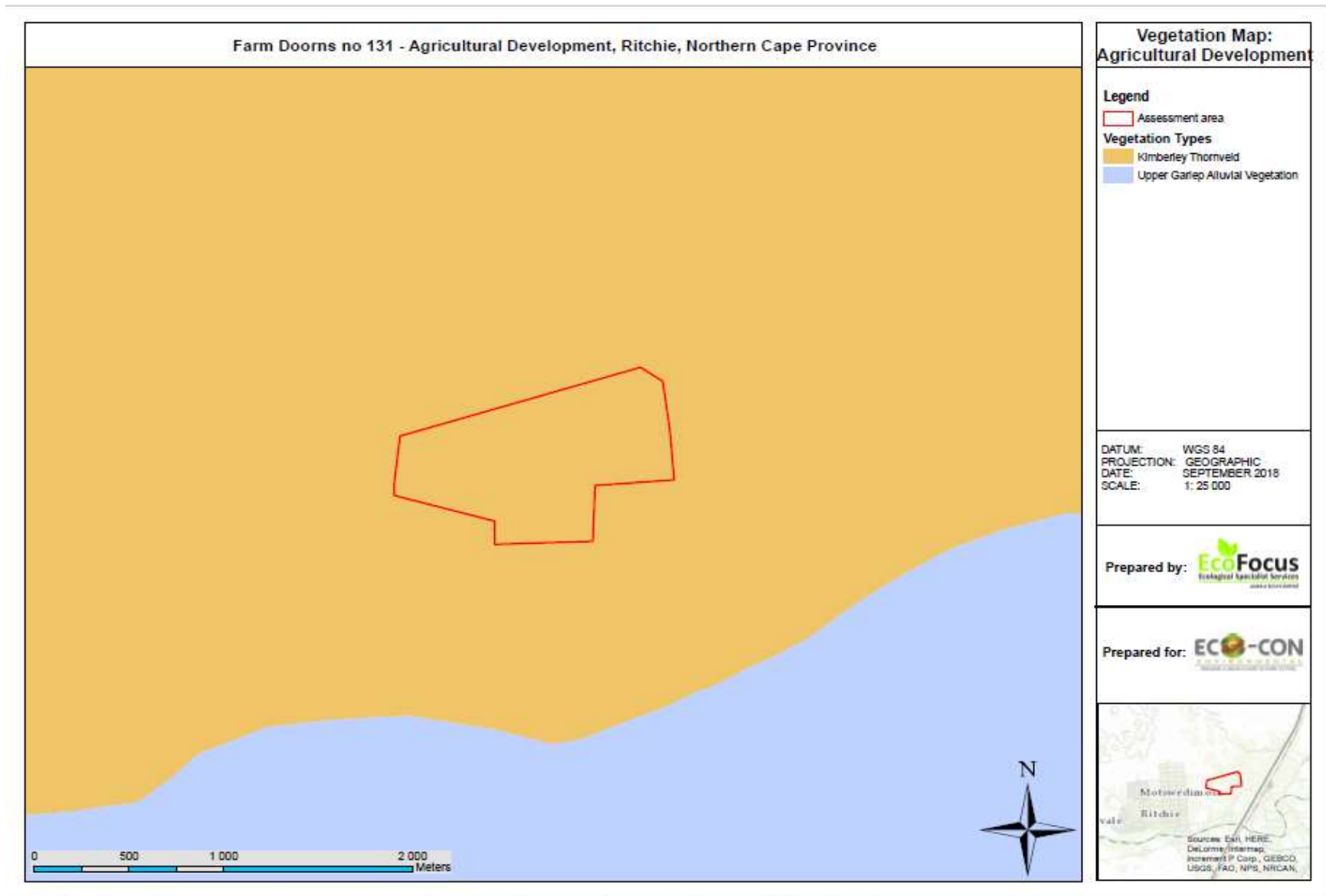


Figure 8: Vegetation map of the proposed project layout (see Appendix B for an A3 size version)

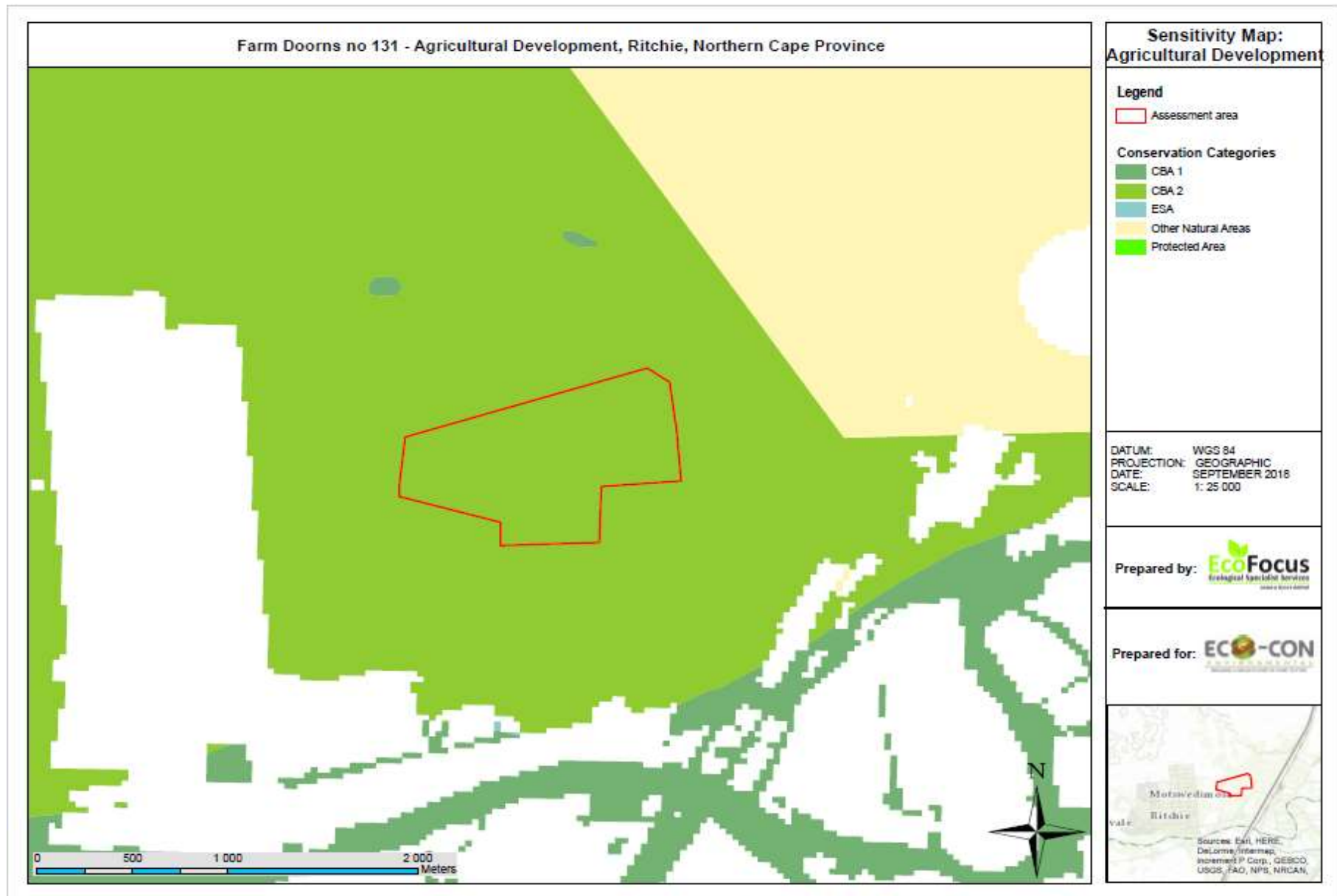


Figure 9: Ecological sensitivity map of the proposed project layout (see Appendix B for an A3 size version)

#### 7.1.4.1 Terrestrial environment

The majority of the assessment area is situated on a historic centre pivot land footprint while only the north-eastern portion is situated on natural virgin soil.

The mechanical clearance of vegetation and soil preparation associated with the proposed agricultural development will in all probability completely transform the majority of the existing natural surface vegetation on the assessment area.

##### Current Existing Vegetation and Site Condition

The portion of the assessment area, situated on the historic centre pivot land footprint has been dormant in excess of ten years. This has allowed for a degree of recovery and ecological succession to take place. This portion constitutes a moderately dense shrubland with a well-established medium height grass layer. The shrubland is completely dominated/infested by the legally declared invasive species *Prosopis spp.* (Category 3) indicating the large degree of disturbance caused by the historic centre pivot land. Virtually no other shrub species were found to be present. The grass layer is mainly dominated by the species *Schmidtia pappophoroides* & *Eragrostis lehmanniana*. Other grass species also found to be present to a significantly lesser extent include *Enneapogon cenchroides*, *Aristida congesta*, *Aristida diffusa*, *Eragrostis echinocloidea* & *Cynodon dactylon*. A very low diversity of forb species is present and is mainly dominated by the species *Senecio hastatus*, *Arctotis venusta* & *Moraea pallida*. The species *Senna italica* & the legally declared invasive species *Argemone mexicana* (Category 1b) are also present but to a significantly lesser extent. This reiterates the level of disturbance caused by the historic centre pivot land. The historic centre pivot land footprint is therefore not reminiscent of the natural climactic state of the relevant Kimberley Thornveld vegetation type (SVk 4).

The historic centre pivot land footprint is traversed by a camp separation fence line which divides the area into an eastern and western portion. The species composition is similar for the two camps but the grass layer biomass of the western camp is significantly lower than that of the eastern camp. The reason for this seems to be that the western camp has likely been used as a winter camp for feeding of livestock.

No Red Data Listed, provincially- or nationally protected or any other species of conservational significance were found to be present within the entire historic centre pivot land footprint. It must however be noted that the time of the assessment was not necessarily favourable for successful identification of all plant species individuals. Therefore, due to the significant historic disturbances caused and the current legally declared invasive species infestation, it is recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint.



Two images illustrating the moderate density of the legally declared invasive species *Prosopis spp.* (Category 3) within the historic centre pivot land footprint as well as the higher grass biomass of the eastern camp relative to the western camp.



Two images illustrating the significantly lower grass layer biomass of the western camp relative to the eastern camp of the historic centre pivot land footprint.

The north-eastern portion of the assessment area is situated on natural virgin soil and constitutes a sparse open savannah with a well-established medium height grass layer situated on deep red sandy Hutton soils. The woody component is mainly dominated by tree and shrub individuals of the nationally protected species *Vachellia erioloba*. Approximately 53 individuals of this species are present of which 7 are large mature individuals ( $\geq 7$  m in height) with broad tree canopies. These broad tree canopies house significant numbers of Cape Sparrow (*Passer melanurus*) nests and possibly also Great Sparrow (*Passer motitensis*) nests, which is provincially a protected species. The shrub species *Vachellia karroo*, *Osteospermum spinescens*, *Lycium*

*hirsutum* are sparsely scattered throughout the north-eastern portion of the assessment while the karroid shrub species *Hertia pallens*, *Felicia muricata*, *Crotolaria orientalis* & *Pentzia glubosa* are also moderately distributed throughout the area. 22

The grass and forb layer of the north-eastern portion has a similar species composition to that of the historic centre pivot land footprint. Two individuals of the provincially protected forb species *Boophone disticha* and a single individual of the provincially specially protected species *Harpagophytum sp.* were also found to be present within the north-eastern portion of the assessment area. It is however highly likely that there could be more individuals of these species present. It is therefore recommended that an additional ecological walkthrough of the final development footprint area be conducted prior to commencement of the project during the flowering period of underground bulb plant species. This will ensure that no provincially protected or significant species have potentially been omitted. Due to the significant presence of the nationally protected tree species *Vachellia erioloba* as well as the presence of the provincially protected and specially protected species, it is further recommended that the development of the new centre pivot land be kept away from the north-eastern portion of the assessment area.





Two images illustrating the sparse open savannah of the north-eastern portion of the assessment area dominated by the nationally protected species *Vachellia erioloba*.



Image illustrating the presence of the provincially protected species *Boophone disticha*.





Image illustrating the presence of the provincially specially protected species *Harpagophytum sp.*



Image illustrating the significant presence of Sparrow (*Passer spp.*) nests within the broad canopies of large mature *Vachellia erioloba* tree individuals.

An old cement dam is present within the north-eastern portion of the assessment area which historically provided drinking water for livestock. The small confined local area surrounding the cement dam, has therefore been significantly disturbed by livestock trampling activities over time and the area has subsequently been infested by the legally declared invasive species *Prosopis spp.* (Category 3) & *Argemone mexicana* (Category 1b). The grass layer is also very sparse.



Image illustrating the significantly disturbed small confined local area surrounding the old cement dam which is present within the north-eastern portion of the assessment area.

Due to the flat topography of the broader landscape, no significant watercourses or water drainage lines are present within the assessment area. The ecological connectivity between the assessment area and the Riet River situated approximately 1.2 km south is also virtually cut off by the existing road networks, residential and other agricultural developments.

#### **Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS)**

The Present Ecological State (PES) of the historic centre pivot land footprint is classified as Class C as it is moderately modified. Significant loss and transformation of natural habitat and biota initially occurred during the historic active period of the centre pivot land, but due to it having been dormant in excess of ten years, it has allowed for a degree of recovery and ecological succession to take place. Basic ecosystem functionality has therefore returned to the area.

The Present Ecological State (PES) of the north-eastern portion of the assessment area 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 presence of the old cement dam as well as the ecological 'edge effect' caused by the presence of the historic centre pivot land but the ecosystem functionality has remained essentially unchanged. Such anthropogenic activities tend to cause an ecological 'edge effect' which negatively impacts on the developed/natural interface area and the integrity of the surrounding natural areas and it expands the negative anthropogenic footprint.

Although the Kimberley Thornveld vegetation type (SVk 4) associated with the assessment area, is classified as least threatened (SANBI, 2006- ), the entire assessment area is categorised as a Critical Biodiversity Area two (CBA 2) in accordance with the Northern Cape Provincial Spatial Biodiversity Plan 2016 (NCPSBP), which sets out biodiversity priority areas in the province.

No Red Data Listed, provincially- or nationally protected or any other species of conservational significance were found to be present within the entire historic centre pivot land footprint. It must however be noted that the time of the assessment was not necessarily favourable for successful identification of all plant species individuals.

The woody component of the north-eastern portion of the assessment area is mainly dominated by tree and shrub individuals of the nationally protected species *Vachellia erioloba*. Approximately 53 individuals of this species are present of which 7 are large mature individuals ( $\geq 7$  m in height) with broad tree canopies. These broad tree canopies house significant numbers of Cape Sparrow (*Passer melanurus*) nests and possibly also Great Sparrow (*Passer motitensis*) nests, which is provincially a protected species. Two individuals of the provincially protected forb species *Boophone disticha* and a single individual of the provincially specially protected species *Harpagophytum sp.* were also found to be present within the north-eastern portion of the assessment area. It is however highly likely that there could be more individuals of these species present. 26

The Ecological Importance and Sensitivity (EIS) of the historic centre pivot land footprint is classified as Class D (low) as it is not ecologically important and/or sensitive on any scale. Biodiversity is ubiquitous and not unique. The Ecological Importance and Sensitivity (EIS) of the north-eastern portion of the assessment area is however classified as Class C (moderate) as it is ecologically important and sensitive on local or possibly provincial scale mainly due to the moderate presence of nationally and provincially protected species. Biodiversity may be sensitive to habitat modifications.

Although the historic centre pivot land footprint is not necessarily viewed as being of high conversational significance, the north-eastern portion of the assessment area is therefore viewed as being of moderate conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type and nationally/provincially protected species.

#### **7.1.4.2 Conclusions and Recommendations**

The assessment area is approximately 80 ha in size on which the project applicant proposes to develop a single cultivated centre pivot land of approximately 34 ha in size. The mechanical clearance of vegetation and soil

preparation associated with the proposed agricultural development will in all probability completely transform the majority of the existing natural surface vegetation on the assessment area.

The Kimberley Thornveld vegetation type (SVk 4) associated with the assessment area, is classified as least threatened (SANBI, 2006- ). Although the entire assessment area is further categorised as a Critical Biodiversity Area two (CBA 2) in accordance with the Northern Cape Provincial Spatial Biodiversity Plan 2016 (NCPSBP), the majority of the assessment area is situated on a historic centre pivot land footprint which is not reminiscent of the natural climactic state of the relevant vegetation type. Only the north-eastern portion is situated on natural virgin soil associated with the relevant vegetation type.

No Red Data Listed, provincially- or nationally protected or any other species of conservational significance were found to be present within the entire historic centre pivot land footprint. It must however be noted that the time of the assessment was not necessarily favourable for successful identification of all plant species individuals.

The woody component of the north-eastern portion of the assessment area is mainly dominated by tree and shrub individuals of the nationally protected species *Vachellia erioloba*. Approximately 53 individuals of this species are present of which 7 are large mature individuals ( $\geq 7$  m in height) with broad tree canopies. These broad tree canopies house significant numbers of Cape Sparrow (*Passer melanurus*) nests and possibly also Great Sparrow (*Passer motitensis*) nests, which is provincially a protected species. Two individuals of the provincially protected forb species *Boophone disticha* and a single individual of the provincially specially protected species *Harpagophytum* sp. were also found to be present within the north-eastern portion of the assessment area. It is however highly likely that there could be more individuals of these species present. It is therefore recommended that an additional ecological walkthrough of the final development footprint area be conducted prior to commencement of the project during the flowering period of underground bulb plant species. This will ensure that no provincially protected or significant species have potentially been omitted.

The historic centre pivot land footprint is not necessarily viewed as being of high conversational significance, while the north-eastern portion of the assessment area is viewed as being of moderate conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type and nationally/provincially protected species. It is therefore recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint and be kept away from the north-eastern portion of the assessment area.

Due to the flat topography of the broader landscape, no significant watercourses or water drainage lines are present within the assessment area. The ecological connectivity between the assessment area and the Riet

River situated approximately 1.2 km south is also virtually cut off by the existing road networks, residential and other agricultural developments.

It is the opinion of the specialist that the potentially significant ecological impacts associated with the transformation of the CBA 2, destruction of-/damage to Red Data Listed, nationally or provincially protected species individuals/habitats associated with the assessment area, terrestrial alien invasive species establishment, alteration/contamination of soil and groundwater characteristics/quality and potential over-extraction of irrigation water from the Riet River, can be suitably reduced and mitigated to within acceptable residual levels if the recommended Alternative 1 is developed. The project should therefore be considered by the competent authority for environmental authorisation and approval. The potential ecological impacts associated with Alternative 2 will however be significantly higher than those of Alternative 1 and it is therefore not recommended that Alternative 2 be considered for development.

The proposed development may however only continue if all recommended mitigations measures as per this ecological report are adequately implemented and managed for both the construction and operational phases of the proposed project. All necessary authorisations and permits must also be obtained prior to any commencement.

*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 Doorns No. 131 in order to assess the suitability of the area for pivot irrigation for maize and lucernes.

#### **7.1.5.1 Soils forms**

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

**Table 9: Soil form encountered**

<b>Soil Form</b>	<b>A Horizon</b>	<b>B Horizon</b>	<b>B2/C Horizon</b>	<b>Nr of Profiles</b>
Plooyburg	Orthic A	Red apedal B	Hardpan Carbonate	24
Hutton	Orthic A	Red Apedal B	Rock	13
Bainsvlei	Orthic A	Red Apedal B	Soft plinthic	1
Addo	Orthic A	Neocarbonate B	Soft carbonate B	4

Augrabies	Orthic A	Neocarbonate B	Unspecified material with signs of wetness	2
Brandvlei	Orthic A	Soft Carbonate B	Pedocutanic B	1
Glenrosa	Orthic A	Lithocutanic B	Rock	1
Mispah	Orthic A	Rock Hardpan		2
Coega	Orthic A	Carbonate		1

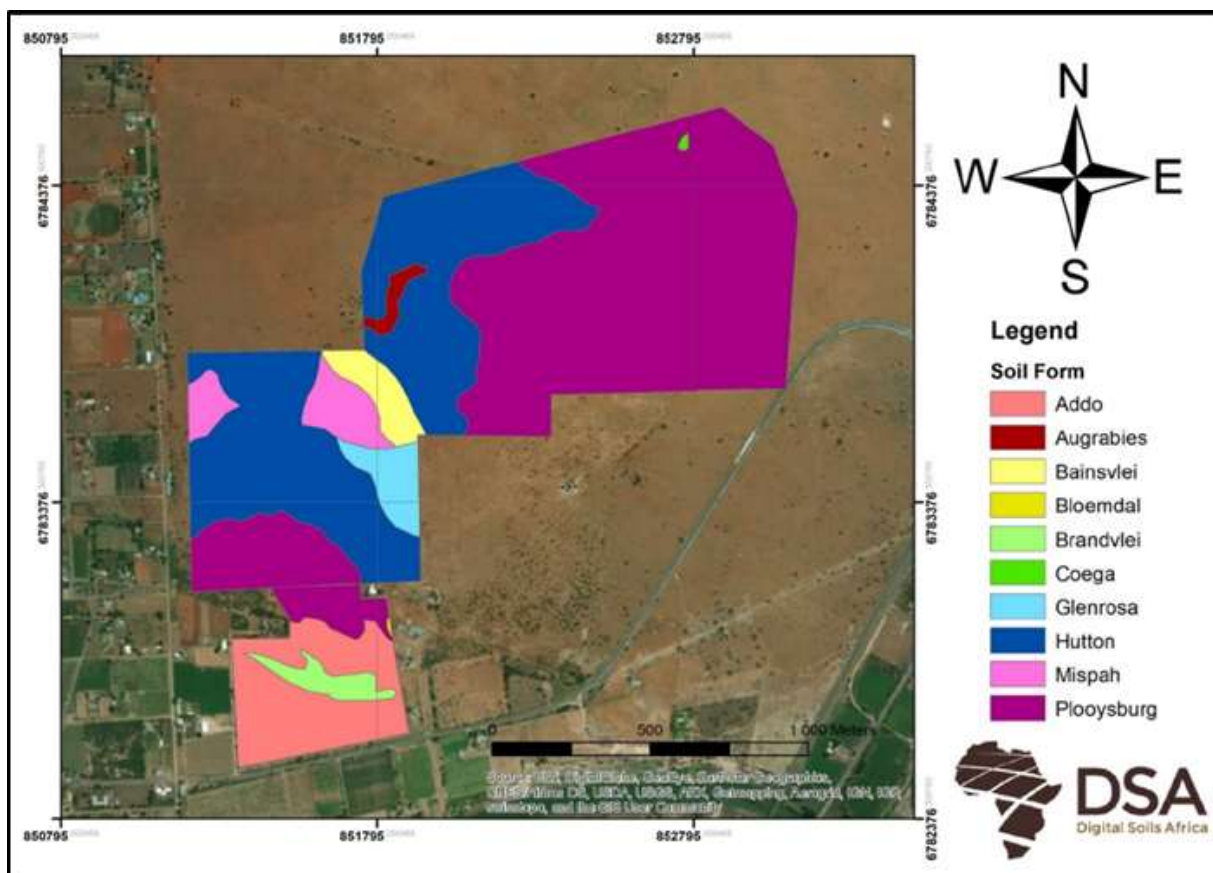


Figure 10: Illustration of soil forms encountered

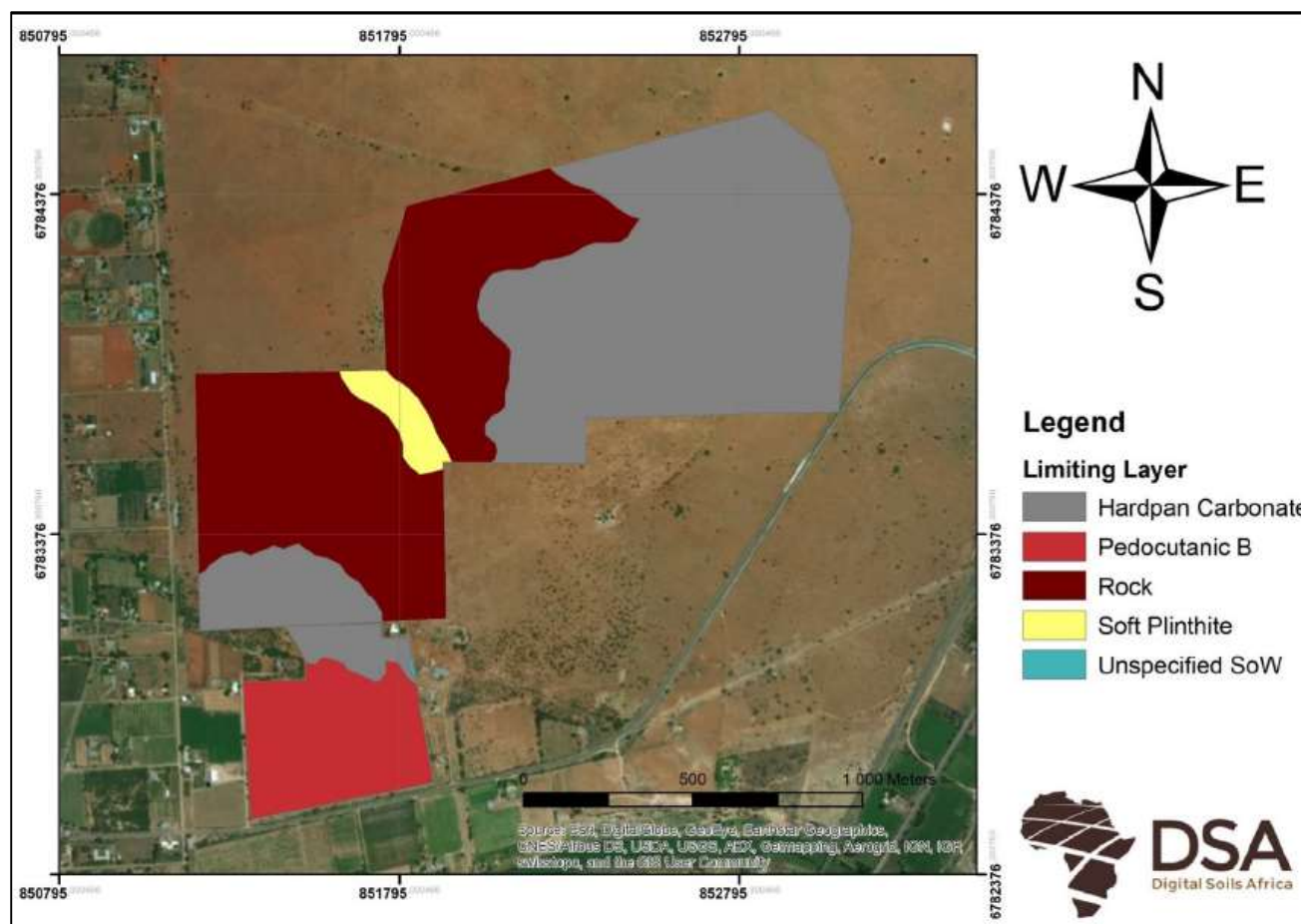


Figure 11: Illustration of infiltration limiting material

### 7.1.5.2 Soil Depth

Two maps are given to show the soil depth. Figure 6 shows the depth of the freely drained material, which is the depth to which water will naturally drain well. This includes the red apedal B, neocarbonate B and lithocutanic B horizons. Figure 7 shows the depth of the drainable material, which is the depth at which an effective drainage pipe could be installed. 8

This is the depth above the pedocutanic B, hardpan carbonate, hard rock, unspecified material with signs of wetness and soft plinthic horizons.

Similar to the soil forms, the soil depth varies considerably throughout the three sites. Generally, the soils are shallow to moderately deep, becoming deeper to the north east. Some shallower areas are scattered throughout the sites.

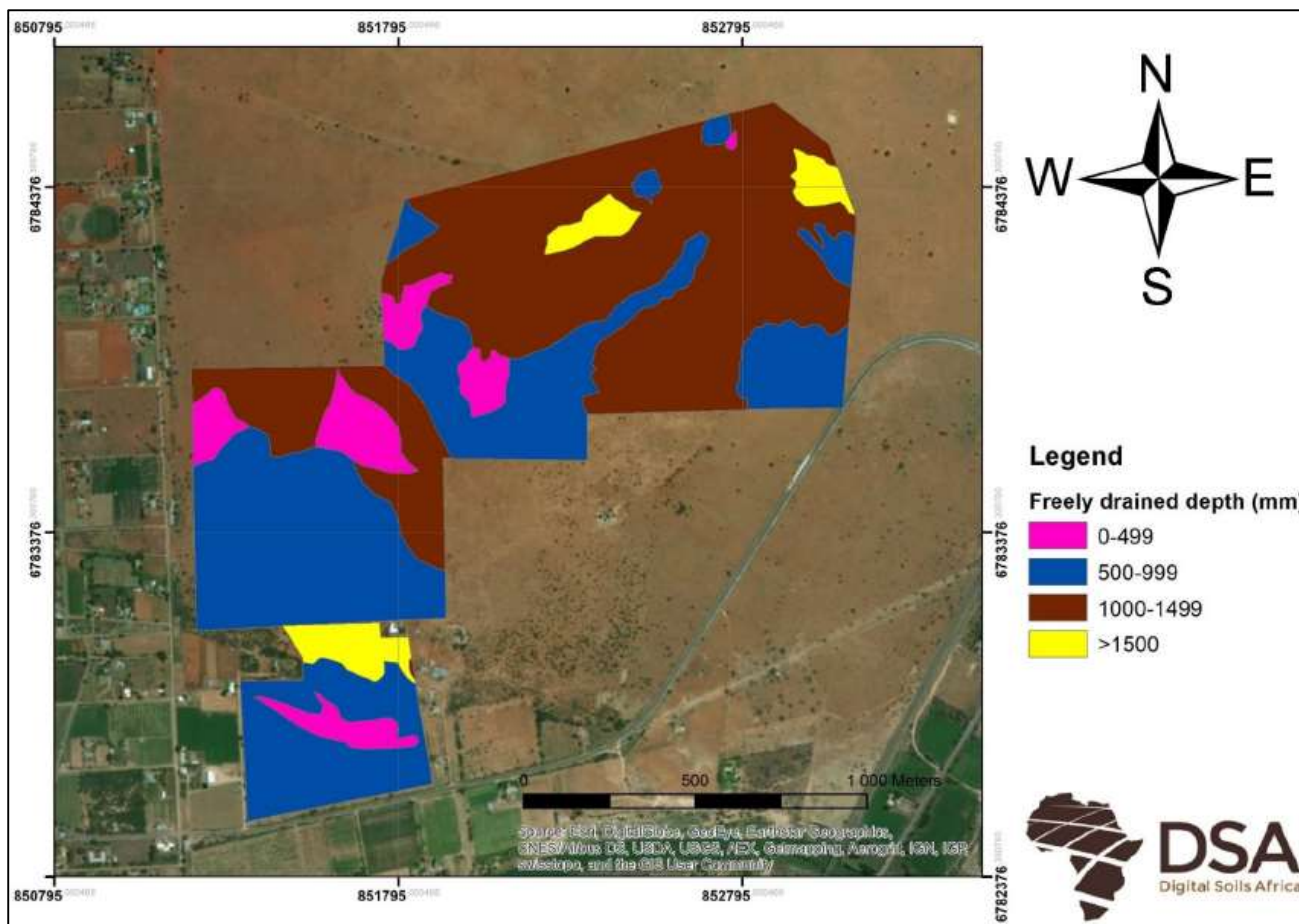
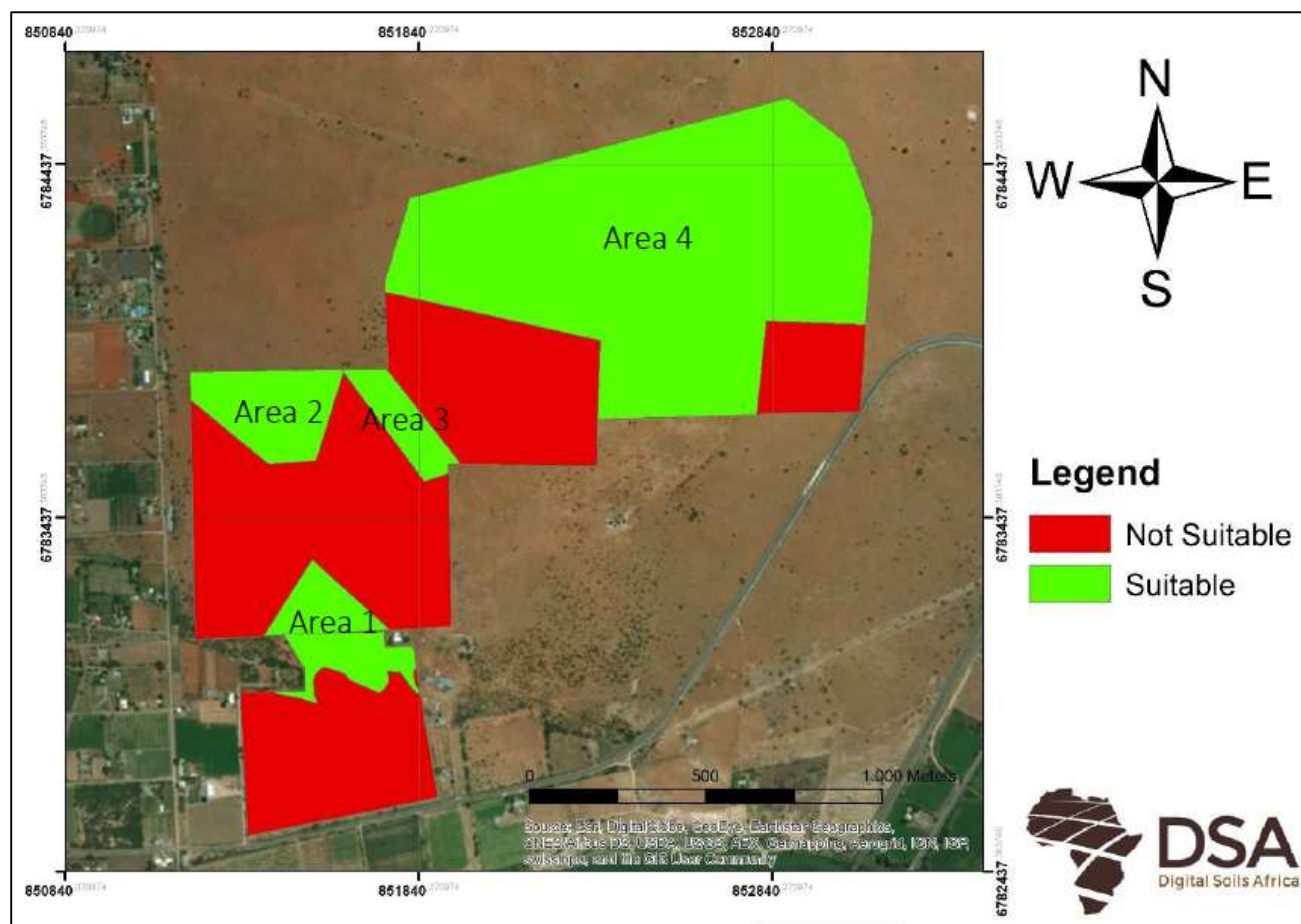


Figure 12: Illustration of drainable depths

### 7.1.5.3 Suitability

As expected for an area with such varied soil forms, the suitability is varied as well (Figure 9). The north east of Site B has the largest area of suitable soils. Mostly deep (hardpan carbonate deeper than 1200 mm) Plooyburg soils occur here, although some shallow Plooyburg soil profiles were also observed. However, drainage will still be adequate, due to the discontinuous nature of the hardpan carbonate. Cross ripping of the area to be irrigated is advised to improve the drainage on the areas with shallow hardpan carbonate layers. To the east Site B is underlain with shallow rock, and is thus unsuitable, while the Pedocutanic B horizon inhibits the drainage of the largest part of the centre pivot site. A small area to the south east of Area B and the north of the centre pivot site is also suitable, mostly occupied with the Plooyburg soil form. Figure 10 shows the area suitable for irrigation on a rectangular shape.





**Figure 13: Illustration of suitability of the proposed project area**

#### 7.1.5.4 Conclusion

The area to the north east is suitable for irrigation, mostly occupied by the Plooyburg soil form, with the hardpan carbonate layer being deep enough to allow for adequate drainage, while shallow rock and pedocutanic B horizon inhibits drainage in the western part of Site B and the largest part of the centre pivot site respectively.

*See specialist report in Appendix E4.*

#### 7.1.6 Heritage

The heritage significance of the affected area was evaluated through a desktop study and carried out on the basis of existing field data, database information, published literature and maps. This was followed up with a field assessment by means of a pedestrian survey and investigation of all exposed sections within the footprint. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes.

Site significance classification standards prescribed by SAHRA (2005) were used to indicate overall significance and mitigation procedures where relevant. There were no limitations or restrictions with regard to access to the site.

The proposed development footprint is very small and will primarily impact on severely disturbed terrain (existing pivot and associated agricultural land) capped and buffered by well developed Quaternary aeolian sand on low relief terrain. There is no evidence of *in situ* Stone Age archaeological material, rock art, prehistoric structures, graves or historically significant structures older than 60 years within the demarcated footprint.

Very little possibility exists that objects of palaeontological, archaeological or historical significance may be uncovered during the course of the proposed development. Given the scale and location of the proposed development the site is not considered palaeontologically or archaeologically vulnerable and is assigned a site rating of Generally Protected C.

## **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:

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.

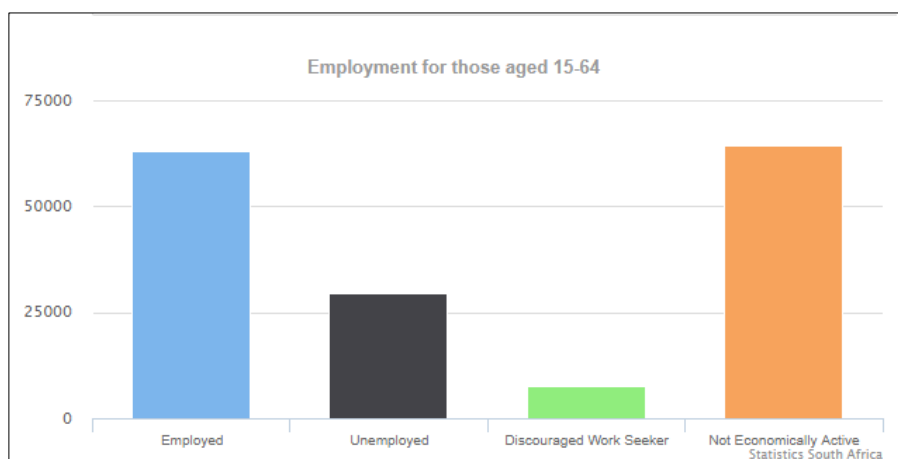
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The following section will provide a brief insight as to the socio-economic conditions in the respective municipal areas:

### **Sol Plaatje Local Municipality:**

#### **Employment:**

The municipality has an employable population of 63 049 people and a total of 64 250 people that are not economically active in the local municipality. The unemployment rate stands at 31,9% with the youth unemployment rate standing at 41,7%.



**Figure 14: Employment Graph for those aged 15-64**

#### **Economic profile:**

The Economic Profile of the Sol Plaatje 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.

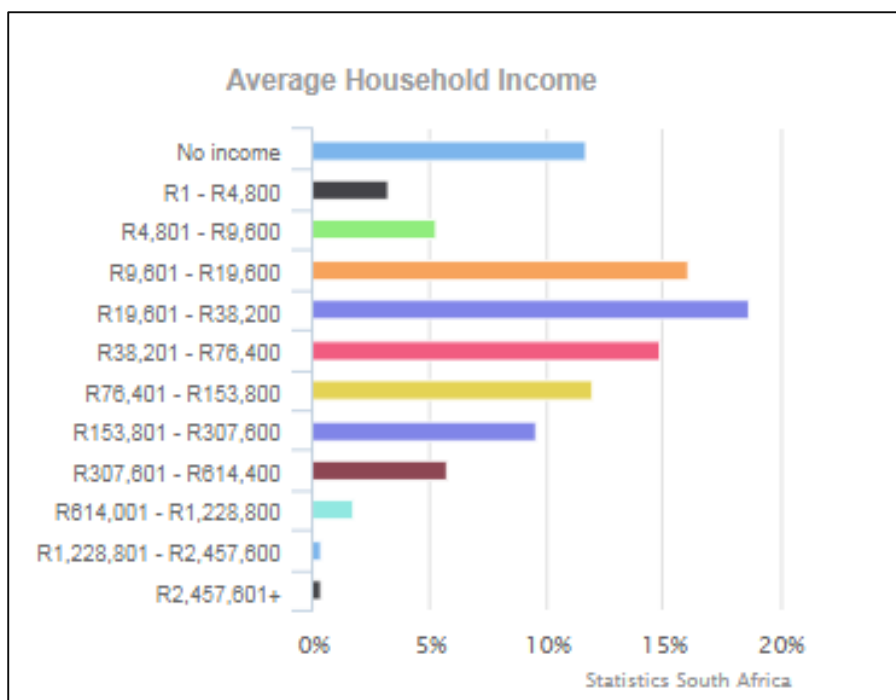
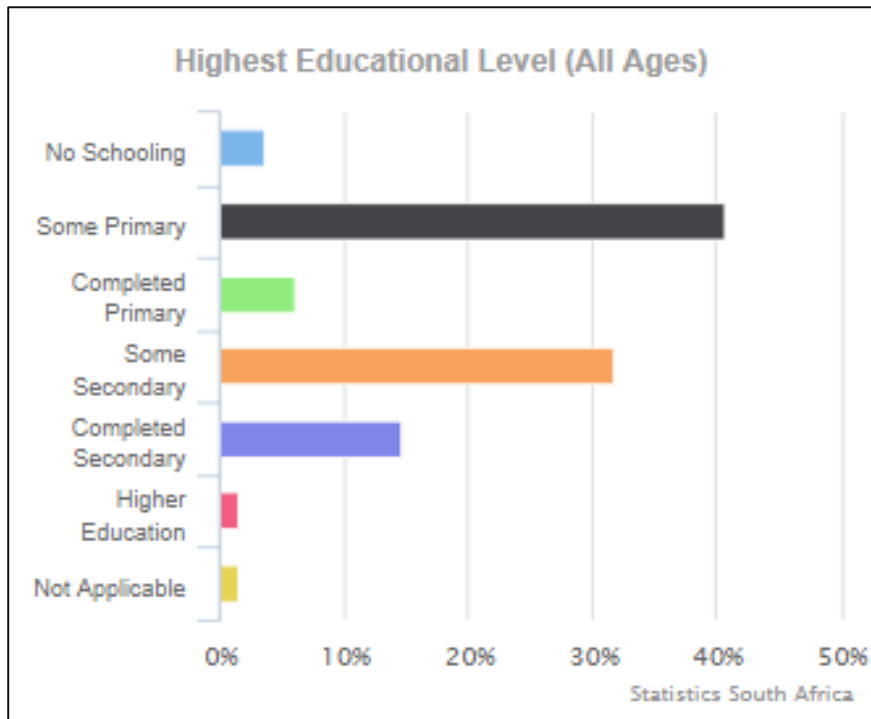


Figure 15: Economic profile graph indicating household income

Level of Education:

According to the Census, Sol Plaatje Local Municipality has a total population of 248 041 people. The majority of the population in the municipality are black at 61,2%, 27,4% are coloured ,7,5% are White, 1,2% are Indian/Asian, with the other population groups making up the remaining 2,7%.

6,1% have completed primary school, 31,7% have some secondary education, 28,8% have completed matric and 1,6% have some form of higher education. Of the mentioned age group (all ages), 3,7% have no form of schooling.



**Figure 16: 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 12 December 2018 and concluded on 1 February 2019 **(including 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 12 December 2018.
- An advertisement was placed in the local newspaper (Noordkaap Koerant) on 12 December 2018 to inform potential I & AP's and invite them to register for the proposed project.
- Written notices were placed at the Sol Plaatje Local Municipality in Kimberley, and Post Office in Ritchie on 12 December 2018.
- Site notices were placed at the main entrance of the Farm Doorns No. 131 as well as at certain portion along the N12 on 12 December 2018.
- Hardcopies of the draft Scoping Report were made available at the Ritchie Post Office for public viewing on 12 December 2018.
- A hardcopy was hand delivered at the offices of the competent authority on 12 December 2018.

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 27 February 2019.

### 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.

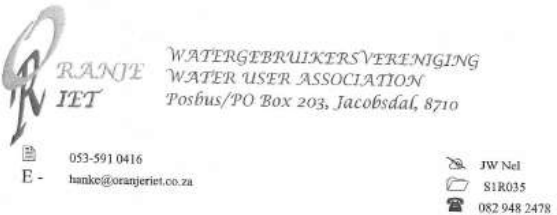

See table below providing the summary of all comments and responses during the Scoping phase:

**Table 10: Comments Received during the 30-day Scoping Phase Public Participation period**

Comments Received during the 30 Day PPP				
Number	Organisation	Name	Tel/Cell	Email
1.	Surrounding Landowner	Mr. George van der Merwe	083 279 0547	george.vdm123@gmail.com
<b>Comments Received:</b>	<p>Hi</p> <p>Thanks for the document I will read it.</p> <p>I just don't understand why an EIA is required as its an already disturbed area and the indigenous vegetation has been removed many years ago?</p> <p>At the most it must be a basic assessment?</p> <p>By using this area again for irrigation is a big positive for Ritchie.</p>			
<b>Response from EAP:</b>	<p>Good morning, George</p> <p>Thank you very much for your comments. It is highly appreciated. Sorry for the delayed response – we only started work again this morning.</p> <p>We agree with you that it is a highly disturbed area and that most of the indigenous vegetation has already been removed. However, according to the National Environmental Management Act (NEMA) the definition of “indigenous vegetation” is as follows: “...<i>vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years</i>”. Furthermore, NEMA also states that if soil has not been cultivated for 10 years, it is regarded as “virgin” soil.</p> <p>Therefore, this project will require environmental authorisation before any development is to take place. Within NEMA, there are 3 listing notices which sets out different activities which triggers the need for either a full Scoping and Environmental Impact Assessment to be done or for only a Basic Assessment Report.</p>			

	<p>The area which is set to be developed has not been cultivated in the past 10 years and the total footprint of the proposed project is 34 ha.</p> <p>According to activity 15 of Listing Notice 2 of NEMA, if 20 hectares or more of indigenous vegetation is to be cleared, it requires a full Scoping and Environmental Impact Assessment to be done.</p> <p>These are thus the reasons for why a full Scoping and Environmental Impact Assessment is required and not a Basic Assessment.</p> <p>Please do not hesitate to contact us if you have any more questions or if we could perhaps assist you with any Environmental Impact Assessment related matters.</p> <p>Have a good day.</p> <p>Kind regards,</p>
<p><b>Feedback received based on EAP response</b></p>	



Number	Organisation	Name	Tel/Cell	Email			
2 Draft Impact Assessment Report for Doorns No. 131	Oranje-Riet Water Users Association	Mnr. Hanke du Toit	082 806 7722	hanke@oranjeriet.co.za			
<b>Comments Received:</b>	 <p> <b>A Robinson</b>          Posbus 110007  <b>HADISONPARK</b>          8306       </p> <p>Meneer,</p> <p><b>ORANJE-RIET WATERGEBRUIKERSVERENIGING : AANSOEK TOT TYDELIKE OORDRAG VAN 20HA (220 000M<sup>3</sup>) WATER (ARTIKEL 25(I) VAN NWW NO 36 VAN 1998) VANAF PERSEEL A51 RIETRIVIER NEDERSETTING OOS NA GEDEELTE 34 VAN DIE PLAAS DOORNS 131 VAN 1 APRIL 2018 TOT 31 MAART 2019</b></p> <p>Hierdie kantoor se skrywe gedateer 31 Julie 2018 verwys.</p> <p>U word net daaraan herinner dat indien u nie voor of op 30 Desember 2018 die nodige stawende dokument (toepaslike magtiging om grond te bewerk) ingedien het nie, u nie vir die 2019/2020 water jaar enige waterreg mag oorplaas na bogenoemde eiendom nie.</p> <p>Afskrif van vorige skrywe word weer vir u aandag aangeheg.</p> <p>U begrip en samewerking word hoog op prys gestel.</p> <p>Die uwe</p>  <p> <b>MNR. HL DU TOIT</b>  <b>HOOF UITVOERENDE BEAMPTIE</b>          29/11/2018       </p> <table border="1" data-bbox="981 884 1236 1030"> <tr> <td> <b>Aanvaarding van inhoud</b>          (Mnr. Robinson)       </td> </tr> <tr> <td>Handtekening</td> </tr> <tr> <td>Datum</td> </tr> </table>				<b>Aanvaarding van inhoud</b> (Mnr. Robinson)	Handtekening	Datum
<b>Aanvaarding van inhoud</b> (Mnr. Robinson)							
Handtekening							
Datum							
<b>Response from EAP:</b>	<p>Goeie dag Mnr. HL du Toit</p> <p>Ek glo dit gaan goed ?</p> <p>Ek stuur die epos ter uitklaring van Mnr. Robinson se watergebruik.</p> <p>Mnr. Robinson het Eco-Con Environmental aangestel om die nodige ploegsertifikaat aansoek te hanteer op die plaas Doorns.</p> <p>Daar is egter `n wetgewende proses om te volg om sodoende `n ploegsertifikaat te kry soos verlang in julle brief aangeheg.</p> <p>Dit sluit in die samestelling van `n Omgewingsimpakstudie wat eers ingedien en aanvaar moet word by die Departement van Omgewingssake. Hierdie proses alleen neem 12 tot 14 maande. Ons het tans die "Scoping" verslag klaar gemaak en die verslag gaan 12 Desember 2018 vir Publieke deelname. Ek sal u insluit en alle dokumente aan u stuur om sodoende op datum te bly met die proses.</p> <p>Na afloop van die publieke deelname sal die "scoping" verslag ingedien word. Sodra dit aanvaar is, sal ons dan met die impakstudie begin. Na die aanvaarding van die impakstudie, sal daar eers aansoek gedoen kan word by Department Landbou vir `n ploegsertifikaat. Hulle aanvaar geen aansoek sonder goedkeuring vanaf die departement van Omgewingssake nie.</p> <p>Dus sal daar ongelukkig geen finale goedkeurings dokument voor 30 Desember 2018 aan u voorsien kan word nie. Dit behoort eers alles klaar te wees teen Junie 2019.</p>						

	<p>Vir enige verder vrae, kan u my gerus skakel.</p> <p>Groete en lekker dag verder</p> <hr/> <p>Good day, Mr. HL du Toit</p> <p>I hope you are well?</p> <p>I am sending this email regarding the wáter use of Mr. Robinson.</p> <p>Mr. Robinson appointed Eco-Con Environmental to acquire the necessary ploughing certificate for the Farm Doorns.</p> <p>There is however legal procedures which need to be followed in order to obtain this ploughing certificate which is required from you as mentioned in your attached letter.</p> <p>This includes the compiling of an Environmental Impact Assessment which needs to handed in and approved by the Departement of Environmental Affairs. This duration of this process alone is between 12-14 months. The Scoping report has been completed by us and the report will be available for public participation on the 12th of December 2018. I will include you and send through all documents in order to keep you up to date with the process.</p> <p>After the public participation process has been completed the final scoping report will be handed in. Once it has been approved, we can start with the Impact Assessment Report. Only after this report can a ploughing certificate be applied for at the Department of Agriculture. They do not accpet any ploughing certificate applications without environmental authorisation from the Department of Environmental Affairs.</p> <p>Thus, no final authorisation letter will be able to be supplied to you before the 30th of December 2018. Everything should be completed in June 2019.</p> <p>You can contact me for any other queries.</p> <p>Regards and have a good day further.</p>
<p><b>Feedback received based on EAP response</b></p>	<p>Ons neem kennis.</p> <p>Groete</p> <hr/> <p>We take note.</p> <p>Regards.</p>

## 8.2 ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The PPP for the Impact Assessment Report commenced on 14 March 2019 and will conclude on 14 April 2019.

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 14 March 2019.
- Hardcopies of the Impact Assessment Report were made available at the Post Office in Ritchie for public viewing on 14 March 2019.
- A hardcopy was hand delivered at the offices of the competent authority on 14 March 2019.

## 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 11: Stakeholders / Organs of State / Organisations / Interested and Affected Parties notified**

Name and Surname	Organisation	Department	Email / Postal:	Tel:
Ms. R Sebolecwe	Sol Plaatje Local Municipality	Acting Municipal Manager	rsebolecwe@solplaatje.org.za	053 830 6706
Mr. Keith Williams	Sol Plaatje Local Municipality	Environmental Department	kwilliams@solplaatje.org.za	053 830 6605
John Makhamba	Sol Plaatje Local Municipality	Ward Councillor (Ward 26)	bonsilejmakhamba@gmail.com	072 263 3876
Ms. Mamikie Bogatsu	Frances Baard District Municipality	Municipal Manager	fatima.ruiters@fbdm.co.za	053 838 0998
Mr. Kenneth Lucas	Frances Baard District Municipality	Environmental Department	kenneth.lucas@fbdm.co.za	053 838 0970
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	Ploughing certificate	hrouxx@gmail.com	0718607550
Mr. Hanke du Toit	Oranje Riet Watergebruiksvereniging/ Water Users Association	Water-Use Licences	hanke@oranjeriet.co.za	082 948 2478

Mr. Khutjo Sekwaila	Northern Cape Department of Water and Sanitation	Commenting Authority for the region	sekwailak@dws.gov.za	053 836 7609
Ms. Refilwe Damane	Northern Cape Department of Water and Sanitation	Commenting Authority for the region	damaner@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
Mrs. Mellissa Mocke	Neighbouring / Surrounding Landowners / Occupiers		P.O. Box 240 Rietrivier 8200	079 708 7672
Mr. Etienne van Schalkwyk	Neighbouring / Surrounding Landowners / Occupiers		Etienne1094@gmail.com	074 081 8129
Mr. Eunis van der Merwe	Neighbouring / Surrounding Landowners / Occupiers		eunis@myconnection.co.za	081 011 8440
Mr. George van der Merwe	Neighbouring / Surrounding Landowners / Occupiers		george.vdm123@gmail.com	083 279 0547
Mr Shawn Engels	Neighbouring / Surrounding Landowners / Occupiers		coaltraining.engels@gmail.com	072 392 4424
Mr. Jacobus Johannes Fibaz	Neighbouring / Surrounding Landowners / Occupiers		P.O. Box 3091 Kimberley 8300	081 357 2384
Mrs. Avalon Botes	Neighbouring / Surrounding Landowners / Occupiers		P.O. Box 240 Rietrivier 8200	079 708 7672

#### 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 12: Scale utilised for the evaluation of the Environmental Risk Ratings**

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

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

	<b>1 - Improbable:</b> <5% chance of the potential impact occurring.
<b>Evaluation Component</b>	<b>Rating Scale and Description/criteria</b>
<b>CUMULATIVE impacts</b>	<p><b>High:</b> 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.</p> <p><b>Medium:</b> 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.</p> <p><b>Low:</b> The activity is localised and might have a negligible cumulative impact.</p> <p><b>None:</b> No cumulative impact on the environment.</p>

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 13: 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.

+	<b>Positive impact (+)</b>	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.
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## 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 land 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.
- 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.



- It is recommended that an additional ecological walkthrough of the final development footprint area be conducted prior to commencement of the project during the flowering period of underground bulb plant species. This will ensure that no provincially protected or significant species have potentially been omitted.
- Alien and invasive species need to be eradicated and controlled.
- Implement an adequate Alien Invasive Species Establishment Management and Prevention Plan during the construction and operational phases. Such a management plan must be compiled by a suitably qualified and experienced ecologist.
- No site construction camps to be established within the surrounding natural areas outside the project footprint area.
- Adequately cordon off the construction area and ensure that no construction activities, machinery or equipment operate or impact within the natural surrounding areas outside the cordoned off area.
- Due to the significant historic disturbances caused by the historic centre pivot land and the current legally declared invasive species infestation, it is recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint.
- Due to the significant presence of the nationally protected tree species *Vachellia erioloba* as well as the presence of the provincially protected and specially protected species within the north-eastern portion of the assessment area, it is recommended that the development of the new centre pivot land be kept away from the north-eastern portion as far as practicably possible.
- Alternative 1 is recommended for development due to its significantly lower impact on the north-eastern portion of the assessment area.

#### **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.
- No site construction camps to be established within the surrounding natural areas outside the project footprint area.

- Adequately cordon off the construction area and ensure that no construction activities, machinery or equipment operate or impact within the natural surrounding areas outside the cordoned off area.
- 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.
- Pivot area needs to be rehabilitated by planting buffalo grass after use.

#### **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.
- Special care is to be taken not to work near or disturb any vulture nests, especially during breeding 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.
- Where 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 vegetation clearance.			Activity: Proposed development of a maize and lucern pivot.		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
<b>Magnitude:</b>	4	2	6	4	2
<b>Duration:</b>	4	3	4	3	1
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	3	2	3	2	1
<b>Reversibility:</b>	4	3	4	3	2
<b>Probability:</b>	3	2	4	2	2
<b>Total SP:</b>	51	24	76	28	14
<b>Significance rating:</b>	Medium (M)	Low (L)	Medium-High (MH)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation.</li> <li>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.</li> <li>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.</li> <li>No site construction camps to be established within the surrounding natural areas outside the project footprint area.</li> <li>Adequately cordon off the construction area and ensure that no construction activities, machinery or equipment operate or impact within the natural surrounding areas outside the cordoned off area.</li> <li>Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.</li> <li>Existing roads and farm tracks in close proximity to the proposed project area must be used during construction.</li> <li>An additional ecological walkthrough is to be conducted prior to the commencement of the project during the flowering period of underground bulbous plant species.</li> <li>A Provincial Flora Permit and National Protected Tree Permit has to be obtained prior to the commencement of any construction activities.</li> <li>Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment.</li> <li>Alien and invasive species need to be eradicated and controlled.</li> <li>Due to the significant historic disturbances caused by the historic centre pivot land and the current legally declared invasive species infestation, it is recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint.</li> <li>Due to the significant presence of the nationally protected tree species <i>Vachellia erioloba</i> as well as the presence of the provincially protected and specially protected species within the north-eastern portion of the assessment area, it is recommended that the development of the new centre pivot land be kept away from the north-eastern portion as far as practicably possible.</li> <li>Alternative 1 is recommended for development due to its significantly lower impact on the north-eastern portion of the assessment area.</li> </ul>				
Potential Fauna and Avifauna Impacts:					

<b>Nature of impact:</b> Direct impact on Fauna and Avifauna as a result of vegetation clearance.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	4	2	6	4	2
<b>Duration:</b>	4	3	4	3	3
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	3	2	3	2	1
<b>Reversibility:</b>	4	3	4	3	1
<b>Probability:</b>	3	2	3	2	1
<b>Total SP:</b>	51	24	57	28	8
<b>Significance rating:</b>	Medium (M)	Low (L)	Medium (M)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.</li> <li>Existing roads and farm tracks in close proximity to the proposed project area must be used during construction.</li> <li>Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment.</li> </ul>				
<b>Potential Dust Impacts:</b>					
<b>Nature of impact:</b> Dust nuisance generated during the development / preparation of the pivot.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	4	2	4	2	2
<b>Duration:</b>	2	2	2	2	2
<b>Extent:</b>	2	1	2	1	1
<b>Irreplaceable:</b>	2	2	2	2	1
<b>Reversibility:</b>	2	2	2	2	2
<b>Probability:</b>	4	3	4	3	2
<b>Total SP:</b>	48	27	48	27	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>Dust Management measures must be implemented in order to manage and minimize undesired dust emissions.</li> <li>Access roads need to be well maintained and dust suppression need to be applied during windy days.</li> </ul>				



	<ul style="list-style-type: none"> <li>Pivot need to be rehabilitated by planting buffalo grass while not in use.</li> </ul>				
<b>Potential Noise Impacts:</b>					
<b>Nature of impact:</b> Noise nuisance generated during the development / preparation of the pivot.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	2	2	2	2
<b>Duration:</b>	2	2	2	2	2
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	2	2	2	2	1
<b>Reversibility:</b>	2	1	2	1	2
<b>Probability:</b>	2	2	2	2	2
<b>Total SP:</b>	24	18	24	18	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>Limit working hours of noisy equipment to daylight hours.</li> <li>Fit silencers to equipment.</li> <li>Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to a single:00 Mondays to Fridays).</li> <li>Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.</li> <li>No loud music is permitted on site or in the camp.</li> </ul>				
<b>Potential Cultural and Heritage Impacts:</b>					
<b>Nature of impact:</b> Damage and destruction of vertebrate fossils during excavation activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	2	2	2	2
<b>Duration:</b>	2	1	2	1	2
<b>Extent:</b>	1	1	1	1	1
<b>Irreplaceable:</b>	2	1	2	1	1
<b>Reversibility:</b>	2	1	2	1	2
<b>Probability:</b>	1	1	1	1	2
<b>Total SP:</b>	9	6	9	6	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Under no circumstances shall any heritage material be destroyed or removed from site.</li> <li>Excavations must be limited to the footprint area and be maintained in a narrow corridor.</li> <li>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:             <ul style="list-style-type: none"> <li>All construction in the immediate 50 metre vicinity of the site must be ceased.</li> <li>The heritage practitioner must be informed as soon as possible.</li> <li>In the event of obvious human remains SAPS must be notified.</li> <li>Mitigation measures (such as refilling) must not be attempted.</li> <li>The area in a 50 metre radius of the find must be barricaded with visible taping.</li> </ul> </li> <li>Public access must be limited and the area must be placed under guard.</li> </ul>
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**Potential Surface and Groundwater Contamination Impacts:**

<b>Nature of impact:</b> Surface and Groundwater Contamination during the development / preparation of the pivot.		<b>Activity:</b> Proposed development of maize and lucern pivot			
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
<b>Magnitude:</b>	4	2	4	2	2
<b>Duration:</b>	2	2	2	2	2
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	3	2	3	2	1
<b>Reversibility:</b>	3	2	3	2	2
<b>Probability:</b>	3	2	3	2	2
<b>Total SP:</b>	42	20	42	20	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>Ensure that excavation areas have a predetermined stockpile area for excavated materials.</li> <li>Use overburden for rehabilitation.</li> <li>Any remaining overburden to be disposed of at a licensed waste site.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ul>
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	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender).</li> <li>• Vehicles and machinery must be regularly serviced to avoid spillages.</li> <li>• Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.</li> <li>• Irrigation and fertilisation practices must be adequately managed in order to prevent over-fertilisation or over-irrigation which could lead to significant leaching and contamination of groundwater. A suitably qualified and experienced agricultural specialist must be consulted in order to advise on appropriate management practices.</li> </ul>
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**Potential Waste Management Impacts:**

<b>Nature of impact:</b> Waste impacts by means of waste storage and littering during the development / preparation of the pivot.			<b>Activity:</b> Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		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)

<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited.</li> <li>• Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle.</li> <li>• Keep all work sites including storage areas, offices and workshops neat and tidy.</li> <li>• All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site.</li> <li>• 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.</li> <li>• The burning and burying of solid waste on site is prohibited.</li> <li>• Littering by construction workers shall not be permitted.</li> <li>• General waste shall be removed from site on a weekly basis to an approved landfill site.</li> <li>• Minimise waste by sorting waste into recyclable and non-recyclable materials.</li> </ul>
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**Potential Traffic Impacts:**

<b>Nature of impact:</b> Traffic impacts by means of additional truck and transportation to and from site during the development / preparation of the pivot.	<b>Activity:</b> Proposed development of maize and lucern pivot
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Evaluation Component:	Preferred Layout Alternative (Alternative 1)		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:	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Any damage to public roads is to be reported to the management authority and repaired to its original condition.</li> <li>Signage is to be placed on vehicles at all times.</li> </ul>				
<b>Potential Fire Risk Impacts:</b>					
Nature of impact: Increase risk of fires during the development / preparation of the pivot.			Activity: Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		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:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	<ul style="list-style-type: none"> <li>Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment.</li> <li>All construction equipment must have at least one firefighting extinguisher.</li> <li>Workers must be adequately trained in the handling of firefighting equipment.</li> <li>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.</li> </ul>				

	<ul style="list-style-type: none"> <li>Fuel and chemicals must be stored in an area that is acceptable for the client.</li> <li>No smoking will be allowed within close vicinity of the site.</li> </ul>				
<b>Potential Soil Contamination Impacts:</b>					
<b>Nature of impact:</b> Increased Soil contamination by means of hazardous substances.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	4	2	4	2	0
<b>Duration:</b>	2	2	2	2	1
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	3	2	3	2	1
<b>Reversibility:</b>	3	2	3	2	1
<b>Probability:</b>	3	2	3	2	1
<b>Total SP:</b>	42	20	42	20	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>No leaked oil or fuel tankers may contaminate soil</li> <li>All tanks and pipes containing fuel or oil must be inspected on a regular basis</li> <li>Spills outside the bund area must be treated with a spill kit</li> <li>All significant leaks must be reported to the competent authority in terms of NEMA</li> <li>UST must be fitted with leak detectors in order to alert when a leak is occurring.</li> <li>Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices.</li> <li>Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher</li> <li>A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions.</li> <li>All personnel working with fuel must undergo spill kit training</li> <li>The oil/water separator must be inspected on a regular basis and the inspection report must be provided to the ECO and relevant authority.</li> <li>Following a leak or accidental spill, a remediation plan must be compiled and executed.</li> <li>Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.</li> </ul>				
<b>Potential Soil Erosion Impacts:</b>					
<b>Nature of impact:</b> Increased Soil erosion due to construction activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	0	2	0	0
<b>Duration:</b>	1	1	1	1	1

<b>Extent:</b>	0	0	0	0	1
<b>Irreplaceable:</b>	1	0	1	0	1
<b>Reversibility:</b>	1	0	1	0	1
<b>Probability:</b>	1	0	1	0	1
<b>Total SP:</b>	5	6	5	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• 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,</li> <li>• All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line,</li> <li>• Temporary cut off drains may be required to capture storm water and promote infiltration,</li> <li>• 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.</li> <li>• Adequate stormwater and erosion management measures must be implemented for the entire assessment area during the construction and operational phases. This must be done in order to sufficiently manage storm water runoff and clean/dirty water separation in order to prevent any significant erosion from occurring.</li> <li>• Areas surrounding construction footprints must be adequately rehabilitated as soon as practically possible after construction.</li> </ul>
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**Potential Visual Impacts:**

<b>Nature of impact:</b> Increased visual impact due to increased working activities on-site.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	0	2	0	0
<b>Duration:</b>	1	1	1	1	1
<b>Extent:</b>	1	1	1	1	1
<b>Irreplaceable:</b>	2	1	2	1	1
<b>Reversibility:</b>	1	0	1	0	1
<b>Probability:</b>	2	1	2	1	1
<b>Total SP:</b>	14	3	14	3	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• All waste must be placed in bins during operational phase. Keeping the area litter free.</li> <li>• Construction activities may only take place during normal working hours.</li> </ul>				

**Potential Socio-Economic Impacts:**

<b>Nature of impact:</b> Increased socio-economic conditions due to job creation		<b>Activity:</b> Proposed development of maize and lucern pivot			
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	6	8	6	8	8
<b>Duration:</b>	1	1	1	1	1
<b>Extent:</b>	2	2	2	2	2
<b>Irreplaceable:</b>	2	2	2	2	2
<b>Reversibility:</b>	2	2	2	2	2
<b>Probability:</b>	4	5	4	5	4
<b>Total SP:</b>	52	75	52	75	60
<b>Significance rating:</b>	+ Medium (M)	+ Medium-high (MH)	+ Medium (M)	+ Medium-high (MH)	Medium (M)
<b>Cumulative impact:</b>	+ Medium (M)	+ Medium (M)	+ Medium (M)	+ Medium (M)	Medium (M)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>Ensure that low-, medium- and high skilled workers use provided working opportunities.</li> <li>Low-, medium- and high skilled workers must be sourced locally.</li> <li>Where practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities.</li> <li>Individuals must be trained and continuously developed</li> </ul>				

#### 9.4.2 Operational Phase Impacts

<b>OPERATIONAL PHASE</b>					
<b>Potential Flora Impacts:</b>					
<b>Nature of impact:</b> Direct impact on Flora as a result of continuous vegetation clearance.		<b>Activity:</b> Proposed development of a maize and lucern pivot.			
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	4	2	6	4	2
<b>Duration:</b>	4	3	4	3	1
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	3	2	4	3	1
<b>Reversibility:</b>	3	2	3	2	2
<b>Probability:</b>	2	1	3	2	2
<b>Total SP:</b>	32	11	57	28	14

<b>Significance rating:</b>	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation.</li> <li>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.</li> <li>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.</li> <li>Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.</li> <li>An additional ecological walkthrough is to be conducted prior to the commencement of the project during the flowering period of underground bulbous plant species.</li> <li>Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment.</li> <li>Alien and invasive species need to be eradicated and controlled.</li> <li>Due to the significant historic disturbances caused by the historic centre pivot land and the current legally declared invasive species infestation, it is recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint.</li> <li>Due to the significant presence of the nationally protected tree species <i>Vachellia erioloba</i> as well as the presence of the provincially protected and specially protected species within the north-eastern portion of the assessment area, it is recommended that the development of the new centre pivot land be kept away from the north-eastern portion as far as practicably possible.</li> <li>Alternative 1 is recommended for development due to its significantly lower impact on the north-eastern portion of the assessment area.</li> </ul>				
<b>Potential Fauna and Avifauna Impacts:</b>					
<b>Nature of impact:</b> Direct impact on Fauna and Avifauna as a result of habitat loss.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	4	2	6	4	2
<b>Duration:</b>	3	3	3	3	3
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	2	2	3	2	1
<b>Reversibility:</b>	3	3	4	3	1
<b>Probability:</b>	3	2	4	2	1
<b>Total SP:</b>	42	24	72	28	8
<b>Significance rating:</b>	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Medium (M)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Natural veld situated in-between the proposed circular pivot lands must not be impacted upon and must be left in situ.</li> <li>Areas within and immediately surrounding the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment.</li> </ul>				
<b>Potential Dust Impacts:</b>					



Nature of impact: Dust nuisance generated during the operational phase of the pivot.			Activity: Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Magnitude:	4	2	4	2	2
Duration:	2	2	2	2	2
Extent:	2	1	2	1	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	2	2	2	2
Probability:	4	3	4	3	2
Total SP:	48	27	48	27	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:	<ul style="list-style-type: none"> <li>Dust Management measures must be implemented in order to manage and minimize undesired dust emissions.</li> <li>Access roads need to be well maintained and dust suppression need to be applied during windy days.</li> <li>Pivot need to be rehabilitated by planting buffalo grass while not in use.</li> </ul>				
Potential Noise Impacts:					
Nature of impact: Noise nuisance generated during the operational phase of the pivot.			Activity: Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		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:	<ul style="list-style-type: none"> <li>Limit working hours of noisy equipment to daylight hours.</li> <li>Fit silencers to equipment.</li> <li>Unless otherwise specified, normal working hours will apply (i.e. from 07:00 to a single:00 Mondays to Fridays).</li> </ul>				

	<ul style="list-style-type: none"> <li>• Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.</li> <li>• No loud music is permitted on site or in the camp.</li> </ul>				
<b>Potential Cultural and Heritage Impacts:</b>					
<b>Nature of impact:</b> Damage and destruction of vertebrate fossils during excavation activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	2	2	2	2
<b>Duration:</b>	2	1	2	1	2
<b>Extent:</b>	1	1	1	1	1
<b>Irreplaceable:</b>	2	1	2	1	1
<b>Reversibility:</b>	2	1	2	1	2
<b>Probability:</b>	1	1	1	1	2
<b>Total SP:</b>	9	6	9	6	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Under no circumstances shall any heritage material be destroyed or removed from site.</li> <li>• Excavations must be limited to the footprint area and be maintained in a narrow corridor.</li> <li>• 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:                             <ul style="list-style-type: none"> <li>• All construction in the immediate 50 metre vicinity of the site must be ceased.</li> <li>• The heritage practitioner must be informed as soon as possible.</li> <li>• In the event of obvious human remains SAPS must be notified.</li> <li>• Mitigation measures (such as refilling) must not be attempted.</li> <li>• The area in a 50 metre radius of the find must be barricaded with visible taping.</li> </ul> </li> <li>• Public access must be limited and the area must be placed under guard.</li> </ul>				
<b>Potential Surface and Groundwater Contamination Impacts:</b>					
<b>Nature of impact:</b> Surface and Groundwater Contamination during the operational phase of the pivot.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	

<b>Magnitude:</b>	4	2	4	2	2
<b>Duration:</b>	2	2	2	2	2
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	3	2	3	2	1
<b>Reversibility:</b>	3	2	3	2	2
<b>Probability:</b>	3	2	3	2	2
<b>Total SP:</b>	42	20	42	20	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• Ensure that excavation areas have a predetermined stockpile area for excavated materials.</li> <li>• Use overburden for rehabilitation.</li> <li>• Any remaining overburden to be disposed of at a licensed waste site.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender).</li> <li>• Vehicles and machinery must be regularly serviced to avoid spillages.</li> <li>• Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.</li> <li>• Irrigation and fertilisation practices must be adequately managed in order to prevent over-fertilisation or over-irrigation which could lead to significant leaching and contamination of groundwater. A suitably qualified and experienced agricultural specialist must be consulted in order to advise on appropriate management practices.</li> </ul>				
<b>Potential Waste Management Impacts:</b>					
<b>Nature of impact:</b> Waste impacts by means of waste storage and littering during the operational phase of the pivot.	<b>Activity:</b> Proposed development of maize and lucern pivot				
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	2	2	2	2
<b>Duration:</b>	2	2	2	2	2
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	2	2	2	2	1
<b>Reversibility:</b>	2	1	2	1	2
<b>Probability:</b>	2	2	2	2	2

<b>Total SP:</b>	24	18	24	18	16
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>An adequate number of scavenger proof litter bins are to be placed throughout the site, dumping of waste on the site is prohibited.</li> <li>Waste sorting and separation should form part of the environmental induction and awareness programme to encourage and educate personnel to recycle.</li> <li>Keep all work sites including storage areas, offices and workshops neat and tidy.</li> <li>All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site.</li> <li>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.</li> <li>The burning and burying of solid waste on site is prohibited.</li> <li>Littering by construction workers shall not be permitted.</li> <li>General waste shall be removed from site on a weekly basis to an approved landfill site.</li> <li>Minimise waste by sorting waste into recyclable and non-recyclable materials.</li> </ul>				
<b>Potential Traffic Impacts:</b>					
<b>Nature of impact:</b>	Traffic impacts by means of additional truck and transportation to and from site during the operational phase of the pivot.		<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	2	2	2	0
<b>Duration:</b>	2	1	2	1	1
<b>Extent:</b>	1	1	1	1	1
<b>Irreplaceable:</b>	2	1	2	1	1
<b>Reversibility:</b>	2	1	2	1	1
<b>Probability:</b>	1	1	1	1	1
<b>Total SP:</b>	9	6	9	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Any damage to public roads is to be reported to the management authority and repaired to its original condition.</li> <li>Signage is to be placed on vehicles at all times.</li> </ul>				
<b>Potential Fire Risk Impacts:</b>					
<b>Nature of impact:</b>	Increase risk of fires during the operational phase of the pivot.		<b>Activity:</b> Proposed development of maize and lucern pivot		

Evaluation Component:	Preferred Layout Alternative (Alternative 1)		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:	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
Proposed Mitigation:	<ul style="list-style-type: none"> <li>Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment.</li> <li>All construction equipment must have at least one firefighting extinguisher.</li> <li>Workers must be adequately trained in the handling of firefighting equipment.</li> <li>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.</li> <li>Fuel and chemicals must be stored in an area that is acceptable for the client.</li> <li>No smoking will be allowed within close vicinity of the site.</li> </ul>				
<b>Potential Soil Contamination Impacts:</b>					
Nature of impact: Increased Soil contamination by means of hazardous substances.			Activity: Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Magnitude:	4	2	4	2	0
Duration:	4	2	4	2	1
Extent:	2	2	2	2	1
Irreplaceable:	3	2	3	2	1
Reversibility:	2	1	2	1	1
Probability:	2	1	2	1	1
Total SP:	30	9	30	9	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:	<ul style="list-style-type: none"> <li>No leaked oil or fuel tankers may contaminate soil</li> <li>All tanks and pipes containing fuel or oil must be inspected on a regular basis</li> <li>Spills outside the bund area must be treated with a spill kit</li> </ul>				

	<ul style="list-style-type: none"> <li>• All significant leaks must be reported to the competent authority in terms of NEMA</li> <li>• UST must be fitted with leak detectors in order to alert when a leak is occurring.</li> <li>• Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices.</li> <li>• Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher</li> <li>• A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions.</li> <li>• All personnel working with fuel must undergo spill kit training</li> <li>• The oil/water separator must be inspected on a regular basis and the inspection report must be provided to the ECO and relevant authority.</li> <li>• Following a leak or accidental spill, a remediation plan must be compiled and executed.</li> <li>• Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.</li> </ul>
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**Potential Soil Erosion Impacts:**

<b>Nature of impact:</b> Increased Soil erosion due to operational phase activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
<b>Magnitude:</b>	2	0	2	0	0
<b>Duration:</b>	1	1	1	1	1
<b>Extent:</b>	0	0	0	0	1
<b>Irreplaceable:</b>	1	0	1	0	1
<b>Reversibility:</b>	1	0	1	0	1
<b>Probability:</b>	1	0	1	0	1
<b>Total SP:</b>	5	6	5	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• 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,</li> <li>• All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line,</li> <li>• Temporary cut off drains may be required to capture storm water and promote infiltration,</li> <li>• 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.</li> <li>• Adequate stormwater and erosion management measures must be implemented for the entire assessment area during the construction and operational phases. This must be done in order to sufficiently manage storm water runoff and clean/dirty water separation in order to prevent any significant erosion from occurring.</li> <li>• Areas surrounding construction footprints must be adequately rehabilitated as soon as practically possible after construction.</li> </ul>
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**Potential Visual Impacts:**

<b>Nature of impact:</b>	<b>Activity:</b>
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Increased visual impact due to increased working activities on-site.			Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		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:	<ul style="list-style-type: none"> <li>All waste must be placed in bins during operational phase. Keeping the area litter free.</li> <li>Construction activities may only take place during normal working hours.</li> </ul>				
Potential Socio-Economic Impacts:					
Nature of impact:			Activity:		
Increased socio-economic conditions due to job creation			Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		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:	<ul style="list-style-type: none"> <li>Ensure that low-, medium- and high skilled workers use provided working opportunities.</li> <li>Low-, medium- and high skilled workers must be sourced locally.</li> <li>Where practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities.</li> <li>Individuals must be trained and continuously developed</li> </ul>				

**9.4.3 Decommissioning Phase Impacts**

DECOMMISSIONING PHASE					
Potential Dust Impacts:					
Nature of impact: Dust nuisance generated during the decommissioning phase of the project.			Activity: Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Magnitude:	4	2	4	2	2
Duration:	2	2	2	2	2
Extent:	2	1	2	1	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	2	2	2	2
Probability:	4	3	4	3	2
Total SP:	48	27	48	27	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:	<ul style="list-style-type: none"> <li>Dust Management measures must be implemented in order to manage and minimize undesired dust emissions.</li> <li>Access roads need to be well maintained and dust suppression need to be applied during windy days.</li> <li>Pivot need to be rehabilitated by planting buffalo grass while not in use.</li> </ul>				
Potential Surface and Groundwater Contamination Impacts:					
Nature of impact: Surface and Groundwater Contamination during the decommissioning phase of the pivot.			Activity: Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Magnitude:	2	2	2	2	0
Duration:	2	2	2	2	1
Extent:	2	2	2	2	1
Irreplaceable:	2	2	2	2	1
Reversibility:	2	1	2	1	1
Probability:	2	2	2	2	1



<b>Total SP:</b>	24	18	24	18	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• Ensure that excavation areas have a predetermined stockpile area for excavated materials.</li> <li>• Use overburden for rehabilitation.</li> <li>• Any remaining overburden to be disposed of at a licensed waste site.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• Provide suitable and sufficient ablution facilities (1 for every 15 personnel on site and 1 for each gender).</li> <li>• Vehicles and machinery must be regularly serviced to avoid spillages.</li> <li>• Drip trays must be placed beneath all stationary construction equipment and beneath all generators present on site.</li> <li>• Irrigation and fertilisation practices must be adequately managed in order to prevent over-fertilisation or over-irrigation which could lead to significant leaching and contamination of groundwater. A suitably qualified and experienced agricultural specialist must be consulted in order to advise on appropriate management practices.</li> </ul>				
<b>Potential Soil Contamination Impacts:</b>					
<b>Nature of impact:</b> Increased Soil contamination by means of hazardous substances.			<b>Activity:</b> Proposed development of maize and lucern pivot		
<b>Evaluation Component:</b>	<b>Preferred Layout Alternative (Alternative 1)</b>		<b>Layout Alternative 2</b>		<b>No-Go Alternative</b>
	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	2	2	2	2	0
<b>Duration:</b>	2	2	2	2	1
<b>Extent:</b>	2	2	2	2	1
<b>Irreplaceable:</b>	2	2	2	2	1
<b>Reversibility:</b>	2	1	2	1	1
<b>Probability:</b>	2	2	2	2	1
<b>Total SP:</b>	24	18	24	18	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• No leaked oil or fuel tankers may contaminate soil</li> <li>• All tanks and pipes containing fuel or oil must be inspected on a regular basis</li> <li>• Spills outside the bund area must be treated with a spill kit</li> <li>• All significant leaks must be reported to the competent authority in terms of NEMA</li> <li>• UST must be fitted with leak detectors in order to alert when a leak is occurring.</li> </ul>				

	<ul style="list-style-type: none"> <li>• Overfill and spillages during tanker refuelling and fuel dispensing should be prevented by the installation of automatic cut off devices.</li> <li>• Tanker delivery drivers must be present during delivery of fuel with the emergency cut off switch and a fire extinguisher</li> <li>• A closed coupling must be used when fuel is being transferred from the bulk delivery vehicle to the USTs to prevent fugitive emissions.</li> <li>• All personnel working with fuel must undergo spill kit training</li> <li>• The oil/water separator must be inspected on a regular basis and the inspection report must be provided to the ECO and relevant authority.</li> <li>• Following a leak or accidental spill, a remediation plan must be compiled and executed.</li> <li>• Fuel stock must be monitored on a daily basis in order to identify if the tank is leaking.</li> </ul>
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**Potential Soil Erosion Impacts:**

<b>Nature of impact:</b> Increased Soil erosion due to decommissioning activities.			<b>Activity:</b> Proposed development of maize and lucern pivot		
Evaluation Component:	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
<b>Magnitude:</b>	2	0	2	0	0
<b>Duration:</b>	1	1	1	1	1
<b>Extent:</b>	0	0	0	0	1
<b>Irreplaceable:</b>	1	0	1	0	1
<b>Reversibility:</b>	1	0	1	0	1
<b>Probability:</b>	1	0	1	0	1
<b>Total SP:</b>	5	6	5	6	4
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	Low (L)

<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• 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,</li> <li>• All water flow must be controlled using storm water management techniques before discharge into the existing natural drainage line,</li> <li>• Temporary cut off drains may be required to capture storm water and promote infiltration,</li> <li>• 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.</li> <li>• Adequate stormwater and erosion management measures must be implemented for the entire assessment area during the construction and operational phases. This must be done in order to sufficiently manage storm water runoff and clean/dirty water separation in order to prevent any significant erosion from occurring.</li> <li>• Areas surrounding construction footprints must be adequately rehabilitated as soon as practically possible after construction.</li> </ul>
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**Potential Socio-Economic Impacts:**

<b>Nature of impact:</b> Decreased socio-economic conditions due to job loss			<b>Activity:</b> Proposed development of maize and lucern pivot		
	Preferred Layout Alternative (Alternative 1)		Layout Alternative 2		No-Go Alternative

<b>Evaluation Component:</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	<b>Before Mitigation</b>	<b>After Mitigation</b>	
<b>Magnitude:</b>	6	4	4	2	6
<b>Duration:</b>	3	2	3	2	1
<b>Extent:</b>	3	3	3	3	2
<b>Irreplaceable:</b>	2	1	2	1	2
<b>Reversibility:</b>	2	2	2	2	2
<b>Probability:</b>	2	2	2	2	4
<b>Total SP:</b>	32	24	28	20	52
<b>Significance rating:</b>	Low (L)	Low (L)	Low (L)	Low (L)	+ Medium (M)
<b>Cumulative impact:</b>	Low (L)	Low (L)	Low (L)	Low (L)	+ Medium (M)
<b>Proposed Mitigation:</b>	<ul style="list-style-type: none"> <li>• Ensure that low-, medium- and high skilled workers use provided working opportunities.</li> <li>• Low-, medium- and high skilled workers must be sourced locally.</li> <li>• Where practically possible, previously disadvantaged individuals should be provided preference with regards to employment opportunities.</li> <li>• Individuals must be trained and continuously developed</li> </ul>				

## 9.5 CUMULATIVE IMPACTS

The mechanical clearance and soil preparation associated with the proposed agricultural development will in all probability completely transform the majority of the existing surface vegetation on the assessment area.

A significant number of other existing cultivation developments are present around the Riet River to the south which have cumulatively resulted in significant loss of natural habitat and extraction of water from the river. Due to the majority of the assessment area being situated on a historic centre pivot land footprint, which is not reminiscent of the natural climactic state of the relevant vegetation type, the development should not pose any significant cumulative impacts to the ecological connectivity and functionality of the broader habitat and ecosystem.

The transformation of the CBA 2, destruction of-/damage to Red Data Listed, nationally or provincially protected species individuals/habitats associated with the assessment area and alteration/contamination of soil and groundwater characteristics/quality can be suitably reduced and mitigated to within acceptable levels by focussing the development of the new centre pivot land within the historic centre pivot land footprint and implementation of the recommended mitigation measures.

Widespread infestations of the legally declared invasive species *Prosopis spp.* (Category 3) is a significant problem in the Northern Cape Province, which is specifically amplified by agricultural developments. The individuals present within the assessment area will in fact be removed during the construction phase which will prove to be beneficial to the environment. Implementation of an adequate Alien Invasive Species Establishment Management and Prevention Plan, will further prevent any significant establishments during the construction and operational phases which could cumulatively contribute to the provincial dilemma.

It is therefore not anticipated that the proposed development would pose any significant potential cumulative ecological impacts within the broader region if the recommended Alternative 1 is developed.

## 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 one is the best possible alternative since the largest portion of the newly proposed pivot area will fall within a historic pivot footprint area. The historic centre pivot land footprint is not necessarily viewed as being of high conversational significance, while the north-eastern portion of the assessment area is viewed as being of moderate conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type and nationally/provincially protected species.

It is therefore recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint and be kept away from the north-eastern portion of the assessment area.

## 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

After careful consideration of the findings and outcomes during the Scoping phase, Eco-Con Environmental is of the opinion that the full Environmental Impact Assessment (EIA) phase of this proposed project should be allowed to continue in order to comprehensively evaluate the potential impacts vs benefits associated with this proposed project and conclude on the project's final viability. Based on all information that was captured in this report, the proposed development will lead to some impacts or fatal flaws (such as the disturbance and subsequent removal of the single individual of the provincially protected species *Boophone disticha* as well as the removal/disturbance of the 19 individuals of the nationally protected species *Vachellia erioloba*).

Only once a Provincial Flora Permit and National Protected Tree License are received, can the removal and relocation process commence and only once the relocation process is completed can any construction activities commence. A Protected Species Relocation Management Plan is already in place thus the EAP is of the opinion that the project should be considered plausible in the framework of NEMA.

The potentially significant ecological impacts associated with the transformation of the CBA 2, destruction of-/damage to Red Data Listed, nationally or provincially protected species individuals/habitats associated with the assessment area and terrestrial alien invasive species establishment, alteration/contamination of soil and groundwater characteristics/ can be suitably reduced and mitigated to within acceptable residual levels if the recommended Alternative 1 is developed.

The project should therefore be considered by the competent authority for environmental authorisation and approval. The potential ecological impacts associated with Alternative 2 will however be significantly higher than those of Alternative 1 and it is therefore not recommended that Alternative 2 be considered for development.

The proposed development may however only continue if all recommended mitigations measures as per this ecological report are adequately implemented and managed for both the construction and operational phases of the proposed project. All necessary authorisations and permits must also be obtained prior to any commencement.



## 11.2 PRELIMINARY ENVIRONMENTAL IMPACT STATEMENT

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

### The Receiving Environment

The assessment area is approximately 80 ha in size on which the project applicant proposes to develop a single cultivated centre pivot land of approximately 34 ha in size. The mechanical clearance of vegetation and soil preparation associated with the proposed agricultural development will in all probability completely transform the majority of the existing natural surface vegetation on the assessment area.

The woody component of the north-eastern portion of the assessment area is mainly dominated by tree and shrub individuals of the nationally protected species *Vachellia erioloba*. Approximately 53 individuals of this species are present of which 7 are large mature individuals ( $\geq 7$  m in height) with broad tree canopies. These broad tree canopies house significant numbers of Cape Sparrow (*Passer melanurus*) nests and possibly also Great Sparrow (*Passer motitensis*) nests, which is provincially a protected species. Two individuals of the provincially protected forb species *Boophone disticha* and a single individual of the provincially specially protected species *Harpagophytum sp.* were also found to be present within the north-eastern portion of the assessment area. It is however highly likely that there could be more individuals of these species present. It is therefore recommended that an additional ecological walkthrough of the final development footprint area be conducted prior to commencement of the project during the flowering period of underground bulb plant species. This will ensure that no provincially protected or significant species have potentially been omitted.

The historic centre pivot land footprint is not necessarily viewed as being of high conversational significance, while the north-eastern portion of the assessment area is viewed as being of moderate conservational significance for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, broader vegetation type and nationally/provincially protected species. It is therefore recommended that the development of the new centre pivot land be focussed within this historic centre pivot land footprint and be kept away from the north-eastern portion of the assessment area.

Due to the flat topography of the broader landscape, no significant watercourses or water drainage lines are present within the assessment area. The ecological connectivity between the assessment area and the Riet River situated approximately 1.2 km south is also virtually cut off by the existing road networks, residential and other agricultural developments.

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 potential ecological issues to be addressed in the proposed project. However, it will be possible to suitably reduce and mitigate these impacts to within acceptable residual levels if the recommended Alternative 1 is developed. The potential ecological impacts associated with Alternative 2 will however be significantly higher than those of Alternative 1 and it is therefore not recommended that Alternative 2 be considered for development.

After careful consideration of the findings and outcomes during the Scoping phase, Eco-Con Environmental is of the opinion that the full Environmental Impact Assessment (EIA) phase of this proposed project should be allowed to continue in order to comprehensively evaluate the potential impacts vs benefits associated with this proposed project and conclude on the project's final viability. Based on all information that was captured in this report, the proposed development will lead to some impacts or fatal flaws (such as the disturbance and subsequent removal of the single individual of the provincially protected species *Boophone disticha* as well as the removal/disturbance of the 19 individuals of the nationally protected species *Vachellia erioloba*).

It is the opinion of the EAP that the potentially significant ecological impacts associated with the transformation of the CBA 2, destruction of-/damage to Red Data Listed, nationally or provincially protected species individuals/habitats associated with the assessment area and terrestrial alien invasive species establishment, alteration/contamination of soil and groundwater characteristics/ can be suitably reduced and mitigated to within acceptable residual levels if the recommended Alternative 1 is developed.

If Alternative 1 is developed, only 7,57 ha of the newly proposed pivot (north-eastern portion) will be situated on natural virgin soil versus 18,14 ha associated with Alternative 2. Alternative 1 will also only impact on 19 of the 53 identified *Vachellia erioloba* individuals as well as on only one of the two identified *Boophone disticha* individuals. Alternative 1 will not impact on the identified *Harpagophytum sp.* individual

Only once a Provincial Flora Permit and National Protected Tree License are received, can the removal and relocation process commence and only once the relocation process is completed can any construction activities commence. A Protected Species Relocation Management Plan is already in place thus the EAP is of the opinion that the project should be considered plausible in the framework of NEMA.

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 Ritchie Post Office. A downloadable version

is available on the Eco-Con Environmental website: <http://www.eco-con.co.za/projects/> under the name Doorns Agricultural Development.

### 13. REFERENCES

Collins, N.B. 2017. Free State Province Biodiversity Plan: Technical Report v1.0. Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs. Internal Report.

Conservation of Agricultural Resources Act (Act 43 of 1983)

DEA. 2010. *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, Department of Environmental Affairs, Pretoria.

DEA&DP. 2013a. *Guideline on Need and Desirability, EIA Guideline and Information Document Series*. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP).

DEA&DP. 2013b. *Guideline on Alternatives, EIA Guideline and Information Document Series*. Western Cape Department of Environmental Affairs & Development Planning (DEA&DP).

Mucina, L. & Rutherford, M.C. (eds.) 2006. *The Vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

National Development Plan - 2030

National Environmental Management Act (Act 107 of 1998)

National Environmental Management Act (Act 107 of 1998); Environmental Impact Assessment Regulations, 2017

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

National Environmental Management: Waste Act (Act 59 of 2008)

National Forests Act (Act 84 of 1998)

National Heritage Resources Act (Act 25 of 1999)

National Water Act (Act 36 of 1998)

Northern Cape Nature Conservation Act (Act 9 of 2009)

Northern Cape Provincial Growth and Development Strategy (NCPGDS)

Northern Cape Provincial Spatial Biodiversity Plan 2016 (NCPSBP) <http://bgis.sanbi.org/Projects/Detail/203>

Northern Cape Provincial Spatial Development Framework

Frances Baard District Municipality Integrated Development Plan 2015-2016 Review

Republic of South Africa. 1996. Constitution of South Africa (No 108. of 1996). [Online]. Available at: <http://www.info.gov.za/documents/constitution/1996/a108-96.pdf>. [Retrieved on September 2 2013]

Sol Plaatje Local Municipality Integrated Development Plan Final 29 May 2015

South African National Biodiversity Institute (2006- ). The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, <http://bgis.sanbi.org/SpatialDataset/Detail/18>, Version 2012.\*

[www.climate-data.org](http://www.climate-data.org)