



**Client  
Project**

**RCL FOODS LIMITED**

Roodewal Breeder Farm Expansion

EIA Ref No.: NWP/EIA/17/2017

Draft Environmental Management

Programme (EMPr)

March 2018

**Labesh**

ability to sustain

RCL FOODS LIMITED  
Roodewal Breeder Farm Expansion

Draft Environmental Management Programme (EMPr)

EIA Ref No.: NWP/EIA/17/2017

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## REFERENCES

Indiana Small Business Guide to Environmental, Safety and Health Regulations. Chapter 4. Storage Tank Regulations.

SANS 10089-1, 2008. The petroleum industry Part 1: Storage and distribution of petroleum products in above-ground bulk installations.

## DEFINITIONS

### 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 the-

- a) property on which or location where the activity is proposed to be undertaken;
  - b) type of activity to be undertaken;
  - c) design or layout of the activity;
  - d) technology to be used in the activity; or
  - e) operational aspects of the activity;
- and includes the option of not implementing the activity.

### Application

An application for an Environmental Authorisation (EA).

### Biodiversity Plan

A spatial plan that identifies one or more categories of biodiversity priority areas, using the principles and methods of systematic biodiversity planning.

### Biodiversity Sector Plan

A map of Critical Biodiversity Areas and Ecological Support Areas accompanied by contextual information, land and resource-use guidelines and supporting GIS data. The map must be produced using the principles and methods of systematic biodiversity planning. A Biodiversity Sector Plan is the precursor to a Bioregional Plan.

### Biodiversity target (threshold)

The minimum proportion of each ecosystem type that needs to be kept in a natural or near-natural state in the long term in order to maintain viable representative samples of all ecosystem types and the majority of species associated with those ecosystem types.

### Biosphere Reserve

An ecosystem with plants and animals of unusual scientific and natural interest. It is a title given by UNESCO to help protect these ecosystems and associated species etc. The plan is to promote management, research and education in ecosystem conservation. This includes the sustainable use of natural resources.

### Buffer Area

Unless specifically defined, means an area extending 10 kilometres from the proclaimed boundary of a world heritage site or national park and 5 kilometres from the proclaimed boundary of a nature reserve, respectively, or that defined as such for a biosphere.

### Conservation Area

Areas of land not formally protected by law, but informally protected by the current owners and users and managed at least partly for biodiversity conservation. Because there is no long-term security associated with conservation areas, they are not considered a guaranteed form of protection.

### Critical Biodiversity Areas

Terrestrial and aquatic areas required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan.

### **Cumulative Impact**

In relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

### **Development**

The building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, including any associated post development monitoring, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.

### **Development footprint**

Any evidence of physical alteration as a result of the undertaking of any activity.

### **EAP**

An environmental assessment practitioner as defined in section 1 of NEMA.

### **Ecological corridors**

Ecological corridors, also referred to as biodiversity corridors, can be landscape structures of various size, shape and habitat composition that maintain, establish or re-establish natural landscape connectivity. They can have a continuous or interrupted structure or a structure of stepping stones (Jongman *et. al.*, 2002).

### **Ecological Support Areas**

Terrestrial and aquatic areas that are not essential for meeting biodiversity targets, but play an important role in supporting the ecological functioning of one or more Critical Biodiversity Areas, or in delivering ecosystem services.

### **EMPr**

An environmental management programme contemplated in regulations 19 and 23 of the EIA Regulations, 2014.

### **Environment**

The surroundings (biophysical, social and economic) within which humans exist and that are made up of:

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

### **Environmental Impact Assessment**

A systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes Basic Assessment and Scoping and Environmental Impact Reporting.

### **Environmental Impact Assessment Report**

A report contemplated in regulation 23 of the EIA Regulations, 2014.

### **Independent**

In relation to an EAP, a specialist or the person responsible for the preparation of an environmental audit report, means-

- a) that such EAP, specialist or person has no business, financial, personal or other interest in the activity or application in respect of which that EAP, specialist or person is appointed in terms of the EIA Regulations; or
- b) that there are no circumstances that may compromise the objectivity of that EAP, specialist or person in performing such work;

excluding -

- (i) normal remuneration for a specialist permanently employed by the EAP; or
- (ii) fair remuneration for work performed in connection with that activity, application or environmental audit.

### **Indigenous Vegetation**

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.

### **Mitigation**

To anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

### **Phased Activities**

An activity that is developed in phases over time on the same or adjacent properties to create a single or linked entity.

### **Plan of Study for Environmental Impact Assessment**

A study contemplated in regulation 22 of the EIA Regulations that forms part of a Scoping Report and sets out how an Environmental Impact Assessment will be conducted.

### **Present Ecological State (PES)**

The PES of a river is expressed in terms of various components. That is, drivers (physico-chemical, geomorphology, hydrology) and biological responses (fish, riparian vegetation and aquatic invertebrates), as well as an integrated state, the EcoStatus.

### **Protected Area**

An area of land or sea that is formally protected by law and managed mainly for biodiversity conservation. This is a narrower definition than the IUCN definition, which includes areas that are not legally protected and that would be defined in South Africa as Conservation Areas rather than Protected Areas.

### **Registered Interested and Affected Party**

In relation to an application, means an Interested and Affected Party whose name is recorded in the register opened for that application in terms of regulation 42 of the EIA Regulations, 2014.

### **Scoping Report**

A report contemplated in regulation 21 of the EIA Regulations, 2014.

### **S&EIR**

The scoping and environmental impact reporting process contemplated in regulation 21 to regulation 24 of the EIA Regulations, 2014.

### **Significant Impact**

An impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and

negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence.

### **Specialist**

A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies.

### **Systematic Biodiversity Plan**

A plan that identifies important areas for biodiversity conservation, taking into account biodiversity patterns (i.e. the principle of representation) and the ecological and evolutionary processes that sustain them (i.e. the principle of persistence). A systematic biodiversity plan must set quantitative targets/thresholds for aquatic and terrestrial biodiversity features in order to conserve a representative sample of biodiversity pattern and ecological processes.

### **Watercourse**

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

### **Wetland**

Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.



## ABBREVIATIONS

<b>BID</b>	-	Background Information Document
<b>CRR</b>	-	Comments and Response Report
<b>DWS</b>	-	Department of Water and Sanitation
<b>EA</b>	-	Environmental Authorisation
<b>EAP</b>	-	Environmental Assessment Practitioner
<b>EIA</b>	-	Environmental Impact Assessment
<b>EIR</b>	-	Environmental Impact Report
<b>EMF</b>	-	Environmental Management Framework
<b>EMPr</b>	-	Environmental Management Programme
<b>GN</b>	-	Government Notice
<b>I&amp;AP</b>	-	Interested and Affected Party
<b>IWULA</b>	-	Integrated Water Use Licence Application
<b>NEMA</b>	-	National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended
<b>NEM:WA</b>	-	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), as amended
<b>NHRA</b>	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999), as amended
<b>NWA</b>	-	National Water Act, 1998 (Act No. 36 of 1998), as amended
<b>NWREAD</b>	-	North West Department of Rural, Environment and Agricultural Development
<b>R</b>	-	Regulation
<b>SAHRA</b>	-	South African Heritage Resources Agency
<b>S&amp;EIR</b>	-	Scoping and Environmental Impact Reporting

## 1. PROJECT TITLE

Roodewal Breeder Farm Expansion.

## 2. APPLICANT DETAILS

<b>Applicant Name</b>	RCL Foods Limited
<b>Contact Person</b>	Mr Korf Stoltz
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<b>Telephone Number</b>	031 242 8531
<b>Fax Number</b>	086 674 0974
<b>Email Address</b>	Korf.Stoltz@rclfoods.com

## 3. ENVIRONMENTAL ASSESSMENT PRACTITIONER DETAILS

<b>Environmental Assessment Practitioner Company</b>	Labesh (Pty) Ltd
<b>Contact Person</b>	Lourens de Villiers
<b>Postal Address</b>	Postnet Box 469, Private Bag X504, Sinoville, 0129
<b>Telephone Number</b>	082 789 6525
<b>Fax Number</b>	086 552 6837
<b>Email Address</b>	admin@labesh.co.za
<b>Qualifications</b>	B.Sc Earth Science (North West University) Hons B.Sc Geography and Environmental Studies (North West University) M.Sc Water Resource Management (University of Pretoria)
<b>Relevant experience</b>	More than 15 years' experience conducting Environmental Impact Assessment processes

The EAP's full Curriculum Vitae is attached to the Basic Assessment Report under Appendix E.

## 4. LOCATION OF THE PROPOSED DEVELOPMENT AND ACTIVITIES

The property for the proposed development and its associated activities is as follows:

Property/Land Parcel	21 digit Surveyor General Code	Property size
The Remaining Extent of Portion 6 of the Farm Roodewal 322 JQ	TOJQ0000000003220006	467.8485ha
Portion 8 of the Farm Roodewal 322 JQ	TOJQ0000000003220008	406.8471ha
Portion 11 of the Farm Roodewal 322 JQ	TOJQ0000000003220011	406.8032ha
Portion 12 of the Farm Roodewal 322 JQ	TOJQ0000000003220012	312.2624ha
Portion 15 of the Farm Roodewal 322 JQ	TOJQ0000000003220015	668.7238ha
Portion 17 of the Farm Roodewal 322 JQ	TOJQ0000000003220017	441.7311ha
Portion 58 of the Farm Elandsfontein 366 JQ	TOJQ0000000003660058	126.0860ha
<b>Total</b>		<b>2 830.3021ha</b>

The project location is  $\pm 18$ km to the south-west of Rustenburg, in the Kgetlengrivier Local Municipality, Bojanala Platinum District Municipality, North West Province. Access to the project properties is from the R52 as well as the gravel road that links the R52 to the R30 (Derby). The GPS coordinates for the project site are as follows:

25°47'5.70"S; 27° 6'3.87"E

A locality map, provided on the next page, shows the location of the seven project properties, at an appropriate scale.

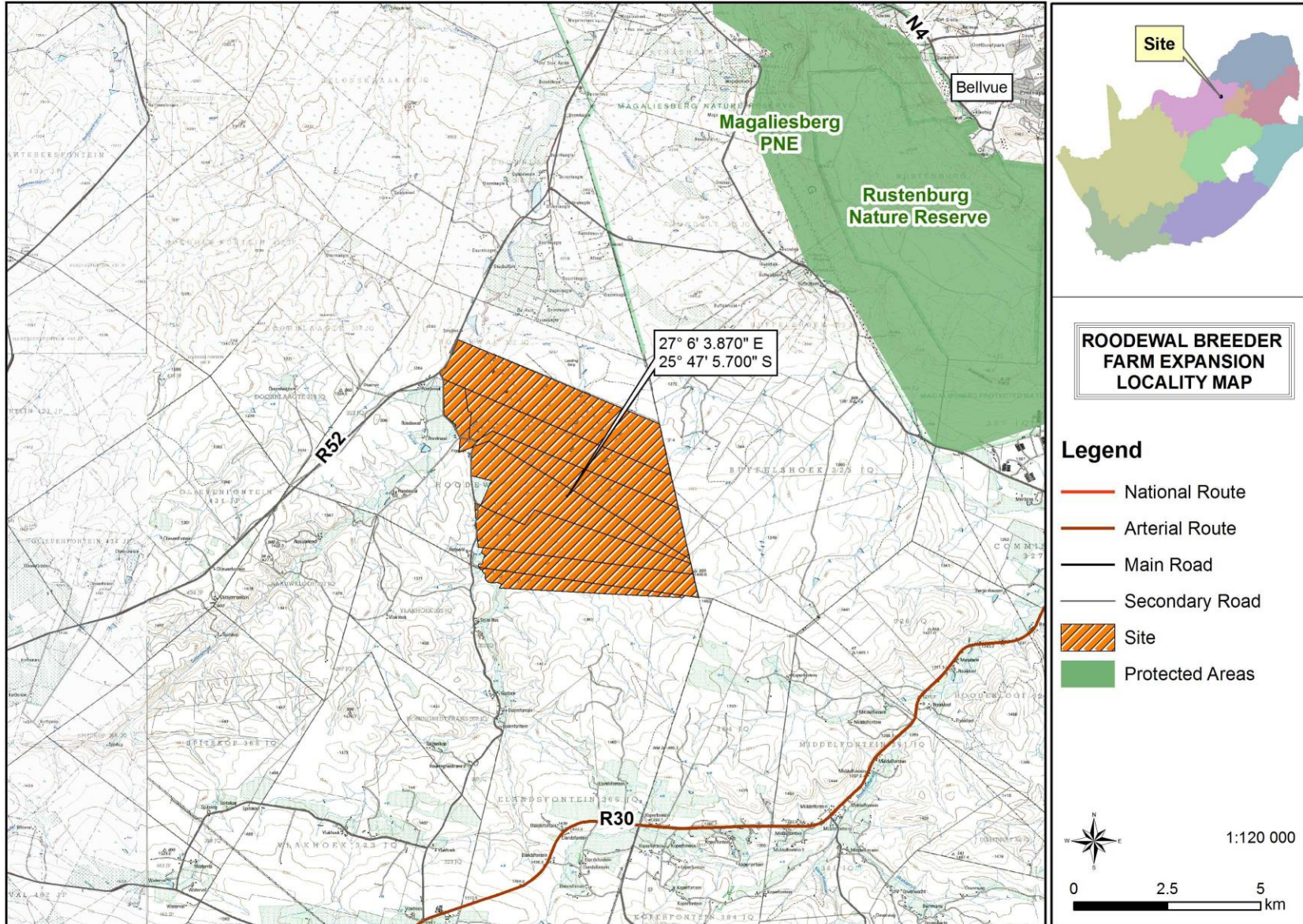


Figure 1: Site locality map

The following photographs give an indication of the current status of the project property.



Figure 2: Existing laying farm photographs



Figure 3: Existing laying farm photographs



Figure 4: Existing laying farm photographs



Figure 5: Existing rearing farm photographs



*Figure 6: Proposed site for the Solar PV Plant*



*Figure 7: Proposed site for the Egg Bank*



Figure 8: Photographs of the proposed rearing sites (currently mostly undisturbed)



## 5. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY THAT ARE COVERED BY THE EMP<sub>r</sub> AS IDENTIFIED BY THE PROJECT DESCRIPTION

### 5.1 Description of the activities to be undertaken

RCL Foods Limited own the largest integrated chicken company, namely Rainbow Chicken Farms, in South Africa. This company supplies 4.7 million broiler chickens into the South African consumer market per week. In the Northern region, which includes the Gauteng and North West Provinces, their production is 1.7 million birds per week.

In the Rustenburg area, RCL Foods Limited own the seven below listed project properties (2 830.3021ha in total). Portions 8, 15 and 17 of the farm Roodewal 322 JQ were existing farms belonging to RCL Foods Limited, whereas Portions 6, 11 and 12 of the farm Roodewal 322 JQ and Portion 58 of the farm Elandsfontein 366 JQ (collectively referred to as Kwa-mmatau) were acquired by RCL Foods Limited in January 2016.

- The Remaining Extent of Portion 6 of the farm Roodewal 322 JQ;
- Portion 8 of the farm Roodewal 322 JQ;
- Portion 11 of the farm Roodewal 322 JQ;
- Portion 12 of the farm Roodewal 322 JQ;
- Portion 15 of the farm Roodewal 322 JQ;
- Portion 17 of the farm Roodewal 322 JQ; and
- Portion 58 of the farm Elandsfontein 366 JQ.

#### Current activities on the project site

Currently, RCL Foods Limited operates nine (9) chicken farms on the two northernmost properties (Portions 8 and 15 of the farm Roodewal 322 JQ). The nine farms consist of three rearing farms on the western side of the properties and six laying farms on the eastern side of the properties.

#### Rearing Farms

The three Rearing Farms each consist of seven Rearing houses, with a total of 21 Rearing houses. At each Rearing Farm, there are six female houses and one male house. The house dimensions are 56m x 15m (840m<sup>2</sup>). At each farm, there are 52 920 female birds and 6 350 male birds. In total, there are therefore 177 810 birds between the three Rearing Farms. As there are two production cycles per year, this equates to 355 620 birds per year.

#### Laying Farms

The six Laying Farms each consist of six houses, with a total of 36 Laying houses. The house dimensions are 99m x 16m (1 584m<sup>2</sup>). At each farm, there are 49 745 female birds and 5 271 male birds. In total, there are therefore 330 096 birds (females and males) between the six Laying Farms.

#### Current totals

- 57 poultry houses (21 Rearing houses and 36 Laying houses); and
- 685 716 birds per year.

#### The proposed project

The proposed project will entail the expansion and upgrading of the Roodewal Breeder Farm. The motivation for the expansion stems from the following: due to urbanisation and encroachment of mines close to RCL Foods Limited's chicken farms in the Gauteng region, RCL wishes to relocate some of its breeder farms' production to Rustenburg. As part of the relocation, RCL also wishes to increase the capacity of the existing breeder farm.

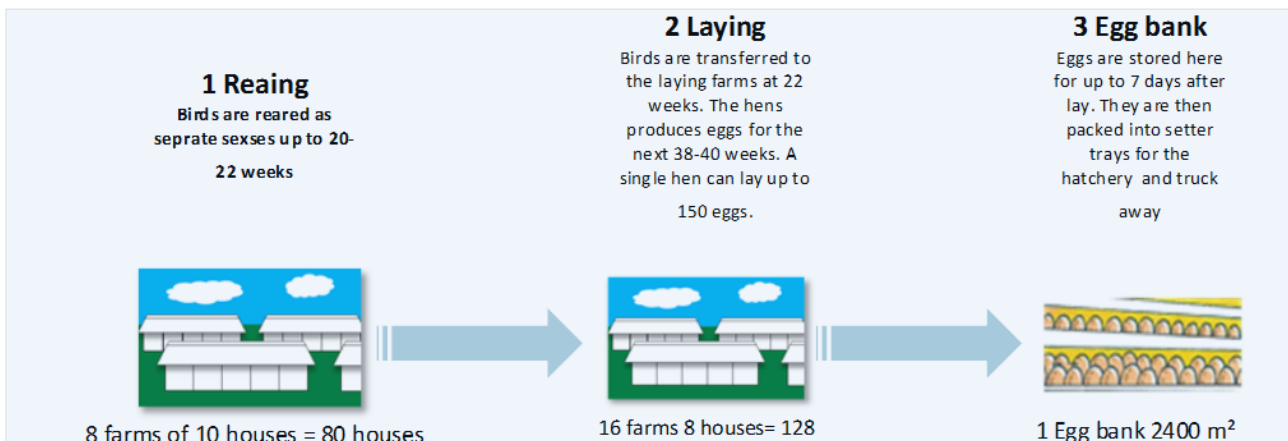
The proposed project will include the changing, upgrading and expansion of the Roodewal Breeder Farm through the following:

- On the northern part of the project site, all of the 21 existing Rearing houses will be upgraded, expanded and converted into Laying houses and the 36 existing Laying houses will be upgraded and expanded. 71 new Laying houses will also be built on the northern part of the site. There will therefore be 128 Laying houses in total (16 farms with eight houses at each farm). The dimensions of the houses will be 114m x 15m (1 710m<sup>2</sup>). Each house will have a capacity for 8 291 female birds and 878 male birds (9 169 birds in total per house). Each farm will therefore house 66 328 female birds and 7 024 male birds. 1 173 632 birds will be kept in Laying houses per year (combined total of the 16 Laying Farms);
- On the southern part of the project site, eight new Rearing farms will be built. Each farm will consist of 8 female houses (64 in total), with dimensions 84m x 15m (1 260m<sup>2</sup>), and 2 male houses (16 male houses in total), with dimensions 75m x 15m (1 125m<sup>2</sup>). Each female house will have a capacity for 8 820 birds and each male house will have a capacity for 4 234 birds. 632 224 birds will be housed per cycle and with two cycles per year, this equates to 1 264 448 birds being kept in Rearing houses per year;
- The construction of an Egg Bank where eggs will be separated into commercial- and production- egg rooms;
- Existing services, including water supply, electricity supply and roads, will be upgraded and expanded upon;
- The construction of a Wastewater Treatment Plant to treat sewage, wastewater and wash water;
- The construction of a new entrance to the Rearing Farm on the southern part of the site;
- The construction of a 10MW Solar PV Plant; and
- The construction of two new Water Reservoirs (±320m<sup>3</sup> each).

#### Proposed totals for the entire site after the expansion

- 208 poultry houses (80 Rearing houses and 128 Laying houses); and
- 2 438 080 birds per year.

Please refer to the figure below for a schematic of the breeder farm processes.



#### Rearing Farms – process description

At the rearing farms, day old chicks are reared (raised) to become laying hens (0-22 weeks). The sexes are split and the males and females are raised separately, with the males in male houses and the females in female houses. Rearing farms are used twice per year (26 week cycles) and the houses are environmentally designed so that the farmer can control all conditions within the houses, including temperature, airflow, humidity, light intensity, water and feed.

Four weeks before placement of the chicks and at the end of the previous production cycle, the houses are prepared. Using a Bobcat front-end loader, the manure from the previous cycle is mechanically pushed to the front of the house

and then loaded onto the manure-buyer's truck. The manure buyer will then remove the manure from the farm. Approximately 60m<sup>3</sup> of manure is generated per house, per cycle (two cycles per year). Once all the manure has been removed, the houses will be dry cleaned, seeped/soaked and wet scrubbed, followed by a steam wash of up to 140°C. This process can take up to six hours per house. A rearing farm with 10 houses will generate 13m<sup>3</sup> of wash water per cycle. As there are eight rearing farms, and two production cycles per year, this equates to 208m<sup>3</sup> of wash water generated at the rearing farms per year (13m<sup>3</sup> x 8 farms x 2 cycles per year). No chemicals are used for the washing process. All wash water will be collected and trucked to the proposed wastewater treatment plant. A sterilisation process is finally also applied to the houses. The cleaning process is conducted according to RCL Foods' Best Operating Practices Manual for the washing of poultry houses.

The rearing farms are heated as they will receive day-old chicks. Two 900 kW hot water boilers will be used to heat water to a temperature of 80°C. The hot water will be transferred with pipes to radiator heaters (called Cubos) that are installed in the rearing houses. Circulation fans will circulate the air inside the house through the heaters until the correct temperature is achieved. A controller will manage the temperature set point and start and stop the heaters as required to maintain the necessary temperature within each house. The water in this heating system is recycled, thereby minimising the usage of water once the system is full and all air has been removed from the system. The water in the system does, however, need to be topped up, but this is not more than approximately 5 litres per day. Two boilers will be used per farm and there will be eight farms at the site. Therefore, there will be 16 boilers in total at the rearing farm, using ±80 litres of top-up water per day (16 boilers x 5 litres of water). 350kg of coal is used per boiler/hour and 10% of this is converted to boiler ash during the combustion process. During summer months, the houses will need to be heated less than in winter months and the coal and water usage will therefore be less in summer than in winter.

As the birds grow feathers, they begin to release heat. The heat released from the flock will eventually necessitate that the houses are cooled. A comprehensive ventilation system will be installed in the houses and will consist of extraction fans, air inlets and a high pressure cooling system. As the heat rises in the house, the controller will open the air inlets and an extraction fan will extract the warm air through the inlets to cool down the house. If this is not sufficient, the high pressure cooling system will be activated to bring the temperature back to set point temperature. The controller will switch between heating and cooling to maintain the desired set point temperature in the houses.

The houses will be equipped with Light Emitting Diode (LED) lighting systems. The lights will also be controlled from the controller to simulate light intensity and day length. No natural day light will be allowed to enter the houses and all air and ventilation entries will be equipped with light excluders to eliminate natural light.

Each farm will be equipped with eight 20ton bulk feed tanks and feed will be delivered into these tanks using trucks. The feed will then be measured and transferred to each poultry house with an auger system. The auger will deliver the feed to the in-house feeding system that will in turn distribute the feed through the houses so that the birds are all fed at the same time.

The houses will have a 2 500kpa water supply to a header tank in order to guarantee water supply to the birds. From this tank the water will flow to the in-house drinking system. The drinker systems are installed throughout the houses to ensure that all the birds have access to water all times.

### **Laying Farms – process description**

Laying farms are the farms where the eggs are produced. At 22 weeks of ages, the male birds are moved from the rearing farms into the layer farm houses. A week later the female birds are moved into the same houses. At this stage, both the male and female birds are maturing. With the addition of light stimulation, mating will start and the first eggs are produced at around 24-25weeks. Layer houses are equipped with nest box systems so there is space for the females to lay their eggs. Layer farms are used once per year (one cycle per year), when the birds are 22-62 weeks of

age. The houses are environmentally designed so that the farmer can control all conditions including temperature, airflow, humidity, light intensity, water/feed supplies and egg collection.

Four weeks before placement of the layer birds, and at the end of the previous production cycle, the houses will be prepared using a similar process as for the rearing farms. Using a Bobcat front-end loader, the manure from the previous cycle is mechanically pushed to the front of the house and then loaded onto the manure-buyer's truck. The manure buyer will then remove the manure from the farm. Approximately 70m<sup>3</sup> of manure is generated per house, per cycle. Once all the manure has been removed, the houses will be dry cleaned, seeped/soaked and wet scrubbed, followed by a steam wash of up to 140°C. This process can take up to six hours per house. A laying farm with eight houses will generate 10.4m<sup>3</sup> of wash water per cycle. As there are 16 rearing farms, and one production cycle per year, this equates to 166.4m<sup>3</sup> of wash water generated at the rearing farms per year (10.4m<sup>3</sup> x 16 farms x 1 cycle per year). No chemicals are used for the washing process. All wash water will be collected and trucked to the proposed wastewater treatment plant. A sterilisation process is finally also applied to the houses. The cleaning process is conducted according to RCL Foods' Best Operating Practices Manual for the washing of poultry houses.

Once the site and houses have been cleaned and sterilised, new wood savings are placed on the floor, the feeding, drinking, heating and nesting equipment is lowered to the floor and operational levels. Controllers are reset and calibrated for the next cycle and all maintenance issues are addressed. This is conducted according to RCL Foods' House Preparation Best Operating Practices Manual. There are no heaters in the layer houses as the birds are mature and fully feathered.

The mature birds will release heat that will necessitate the cooling down of the houses. A comprehensive ventilation system will be installed consisting of extraction fans, air inlets and a high pressure cooling system. As the heat rises in the house, the controller will open air inlets and an extraction fan will extract the warm air through the inlets to cool down the house. If this is not sufficient, the high pressure cooling system will be activated to bring the temperature back to the set point.

Lighting in the layer houses is a more complicated than in the rearing houses since the birds need to be light stimulated to continue to mate. The houses will be equipped with a Light Emitting Diode (LED) lighting system. The lights will also be controlled by the controller to simulate light intensity and day length. There is no restriction to natural daylight.

Each farm will be equipped with eight 20ton bulk feed tanks and feed will be delivered into these tanks using trucks. The male and female birds are fed separately in the layer houses and therefore two different feeding systems will be installed. It will be possible to hoist both systems into the roof after feeding. When the systems are in the roof, they will be refilled with feed. The feed is measured and transferred to each poultry house with an auger system. The auger will deliver the feed to the system in the roof that will in turn distribute the feed through the houses. The following morning, the feeders will be lowered so that the birds have access to the feed at the same time. All of the birds are fed simultaneously.

The houses will have a 2 500kpa water supply to a header tank in order to guarantee water supply to the birds. From this tank the water will flow to the in-house drinking system. The drinker systems are installed throughout the houses to ensure that all the birds have access to water all times. A drinker will also be installed on each nest box to attract the females closer to the nest boxes.

Two lines of automated nest boxes will be installed (refer to *Figure 9* below). The birds will be able to easily access the nests through a lowered, slated floor plate in front of each nest box. A hen will enter the nest box and lay her egg on an astro mat. The egg will then roll to the centre of the nest box and onto the extraction conveyer. The boxes will be

connected via the extraction conveyer to the front of the house where a transfer conveyer will collect the egg and transfer them to an on-site grading room. Egg collection will happen twice per day.

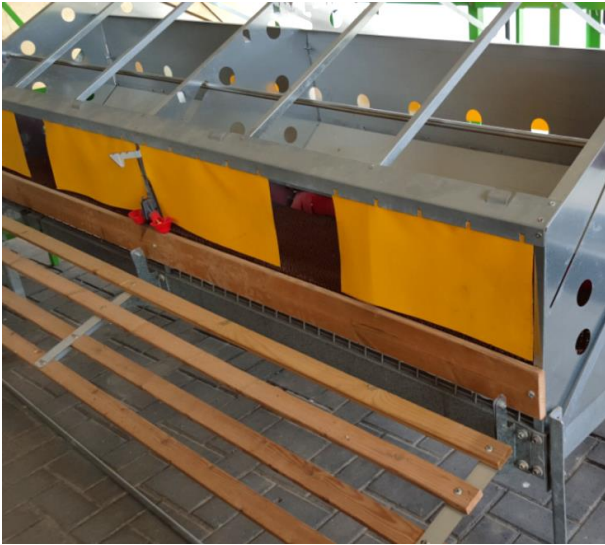


Figure 9: An example of an automated nest box system

Once the eggs arrive in the grading room, a grading machine will strip out all the small and oversized eggs. The good eggs will be packed into trays and the trays will be stacked onto a transfer pallet. The farm's information system will record all the eggs according to size and condition (small, oversized, production and damaged). Once the eggs are properly stacked and counted, they will be moved into the fumigation chamber where they will be fumigated with formalin. A fumigation chamber is built onto each grading room and a controller will manage the fumigation process. When the fumigation is completed, the eggs will be stacked in the farm holding room until the eggs are collected with a collection truck.

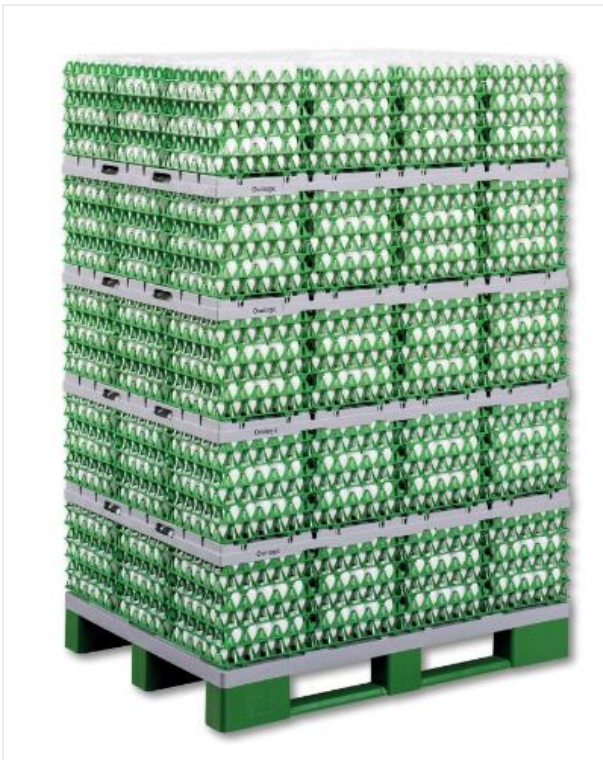


Figure 10: An example of how the eggs will be stacked in trays

## Egg Bank

All the eggs will be collected from the layer farms on a daily basis and transported with a dedicated egg truck to the Egg Bank. At the egg bank, the eggs will be separated between eggs destined for commercial purposes and those destined for production purposes. The commercial eggs will be packed into a commercial egg room and the production eggs into the Egg Bank holding room. The Egg Bank manager will stack all the eggs according to age, weight and flock. The Egg Bank will be equipped with stacking machines. These machines will de-stack the eggs from the egg trays and pack them into the setter trays according to the setting plan of the hatcheries. Once the setter trolleys are packed, the hatchery egg collection truck will collect the loaded setter trolleys from the Egg Bank. Eggs can be stored in the Egg Bank for up to 7 days and the Egg Bank will be equipped with a proper ventilation system to keep the temperature of the eggs at 18°C. Once the egg trays, pallets and trolleys have been used, they will be washed and sterilised before they are re-used on the farm. The Egg Bank will generate 10 000 litres of wastewater per day. This wastewater will be stored in a wastewater tank and removed to the wastewater treatment plant on a daily basis using a wastewater truck/tanker.



Figure 11: An example of packing in the Egg Bank



Figure 12: An example of the egg tray to egg setter tray packing machine

## Biosecurity

Since the Roodewal Breeder Farm will consist of 24 flocks of high density birds it is critical that the biosecurity on the farm is managed with the necessary attention. It is also for biosecurity reasons that the laying and rearing farms will be split (the first on the northern part of the site and the latter on the southern part of the site with ample open space between the northern and southern farms). The farms will also be managed differently and there will be restrictions in terms of movement between the two farms. No person will be allowed to visit any production farms without the authorisation from the RCL Foods' director. All personnel will shower once upon entering the farm and once upon exiting the farm. Furthermore, all vehicles and equipment will be fumigated (as per RCL Foods' Biosecurity Best Operating Practices Manual).

## **Roads**

### **Access**

There are currently two existing access gates to the breeder farm. An additional access gate from the secondary dirt road (R30 towards Derby) will be constructed for the southern rearing farm as part of the proposed expansion project. This access point is further south than the two current access points and is an existing access point that requires an upgrade. Permission for this access point will be obtained from the North West Department of Public Works and Roads. Having separate access points for the laying and rearing farms is vital from a biosecurity perspective.

### **Roads**

On the northern part of the breeder farm (the future laying farm), there are 11.5km of existing gravel roads and storm water infrastructure. An additional 2.26km of roads will need to be built. In-situ material will be used for the road building and where required, G5 material will be obtained from an existing quarry onsite. On the southern part of the breeder farm (the future rearing farm), 8.4km of new roads will need to be built (some existing roads may also be expanded or upgraded as there are existing roads on this part of the farm). In-situ material will be used for the road building and where required, G5 material will be obtained from a new quarry onsite. Please refer to the figure below for the road network layout, the entrances to the farm and the locations of the quarries onsite.

It is proposed for boiler ash generated at the site to be used to fill-in the quarries onsite, as part of the rehabilitation of the quarries. Depending on the classification of the boiler ash, a separate Waste Management Licence may be required. Whether this option will be further explored will be confirmed in due course.

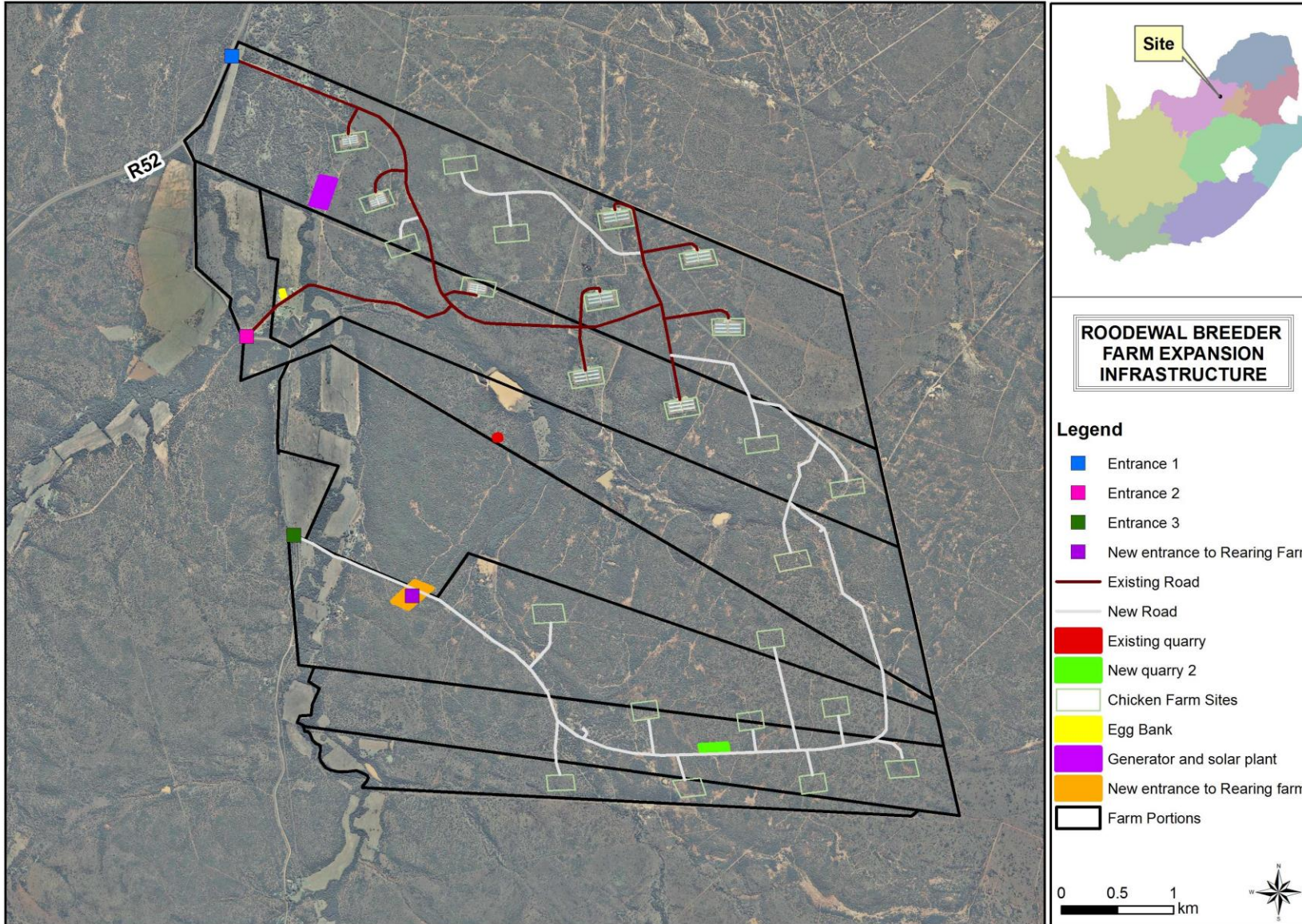


Figure 13: Existing and proposed road infrastructure on the project site



### **Bulk Water Availability**

Water for the farm is currently obtained from two onsite boreholes (Boreholes 1 and 2) on the northern part of the site. It is proposed for two other existing boreholes (Boreholes 3 and 4) that are also equipped, to also be used in future. The locations of the boreholes are shown in *Figure 14* below.

A Water Use Registration application was submitted to the then Department of Water Affairs for the abstraction of groundwater from Boreholes 1 and 2, but has not been issued as yet. Labesh will submit a Water Use Licence application to the Department of Water and Sanitation in due course for all water uses on the site, including the abstraction of groundwater from all four boreholes.

There are two existing water reservoirs on the site (Reservoirs 1 and 2 – on the northern part of the farm), one with a capacity of 1 000m<sup>3</sup> and one with a capacity of 4 000m<sup>3</sup>. Two new 320m<sup>3</sup> water reservoirs (Reservoirs 3 and 4) are also proposed on the southern part of the farm, as part of the expansion project. Please refer to the *Figure 14* below for the localities of the four reservoirs (two existing and two proposed).

The boreholes, reservoirs and water pipelines will together form an integrated ring-feed system for the farm. Groundwater is currently pumped from Boreholes 1 and 2 to Reservoir 1. Reservoir 1 has transfer pumps and from here water is pumped to Reservoir 2. Reservoir 3 and 4 will be added to this system, together with Boreholes 3 and 4. As Boreholes 3 and 4 are situated at a low altitude on the farm, it is proposed for the water from these boreholes to be pumped to a transfer tank from where the water will be pumped to Reservoir 4. Reservoir 2 and 3 will be located at a high altitude and gravity flow will therefore be used to feed water to the farms from these two reservoirs.

The main water ring-line will be ±18.6km in length, with distribution lines running from the main ring-line to the farms totalling ±21.5km in length. It is estimated that the farm will use 1 078m<sup>3</sup> of water per day. The pipes for the main ring-line will be 200mm in diameter and those for the farm's supply will be 160mm in diameter. The peak throughput will be 299 litres of water per second.

### **Storm Water Routing**

Storm water will be released into the environment from built-up surfaces as efficiently and with as little erosion as possible. At this stage, attenuation dams/ponds are not deemed necessary.

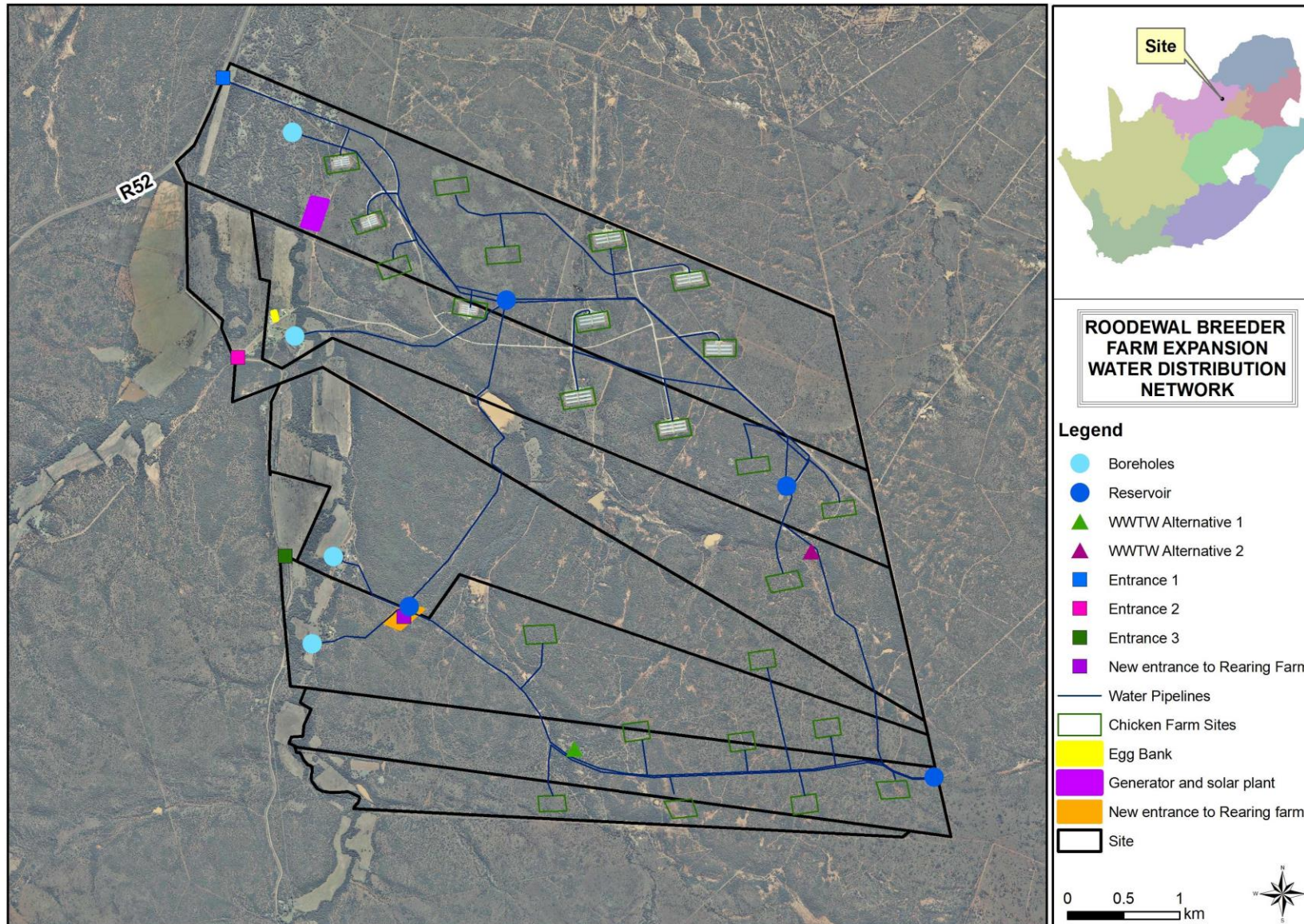


Figure 14: Water distribution network for the project site

## **Sewage and Wastewater**

### **Wash water**

The rearing farms will be depleted twice a year and the laying farms once per year (after each production cycle). After each depletion/production cycle, the houses will be cleaned and sterilised, as discussed under Section 5.1 of this report. There will be 32 wash cycles per year and a total of 374.4m<sup>3</sup> of wash water will be generated at the breeder farm per year. All wash water will be taken to the proposed wastewater treatment plant for treatment to a quality that complies with the Department of Water and Sanitation's General Limit Standards for discharge into a water resource.

### **Sewage**

All sewage from the ablution blocks and residences will pass through septic tanks from where the liquid component is collected together with shower water and fed into a 100m<sup>3</sup> collection tank at each site. From here, a honey-sucker truck will collect the sewage and take it to the holding tank at the proposed wastewater treatment plant, prior to its treatment there. This will be done every day.

### **Wastewater Treatment Plant**

The proposed wastewater treatment plant will treat the sewage, wash water and wastewater to a potable quality (and General Limit Standards for discharge into a water resource). The treated water will be passed through an artificial wetland system and from there released into the environment, specifically into a drainage line. The treatment plant will have the capacity to treat 17m<sup>3</sup> of wastewater per day. The previous figure (*Figure 14*) shows the two alternative locations for the proposed wastewater treatment plant. More detail regarding the treatment process and the designs of the artificial wetland will be included in subsequent reports.

### **Electricity**

The applicant intends to consolidate the nine electricity delivery points on the breeder farm to a single 3.5 Mva notified load from Eskom. The supply will be delivered at 11kV and the Eskom reference number for the notified load application is 189325644. The motivation for the single supply point is because the applicant wants to generate a base load from renewable energy (from the solar PV plant) during daylight hours, thereby reducing their electricity costs. The solar PV plant is only feasible if all the supply points are consolidated and Eskom has already approved a 3Mva supply to the breeder farm.

### **High tension electrical main ring**

Electrical power on the farm will be increased from 400V to 11kVa and distributed through the breeder farm with ±32km of 11kVa main ring. At each farm a step-down transformer (150kVa) will decrease the power from 11kVa to 400V into the low tension distribution boards.

### **Switchgear**

The main switchgear to the farm will be installed after the Eskom supply point. This will be 11kV high tension switches that will be managed by a SMEC controller. The controller will manage the load between the main incoming Eskom supply, the solar plant and the generators.

### **Proposed Solar PV Plant**

A 10MW solar PV plant will be installed to generate a base load of electricity for the breeder farm. During daylight hours as much of this renewable electricity will be used to power the farm as possible. Please refer to *Figure 15* below for the electricity distribution network, including the location of the solar PV plant.

### **Diesel Generation Plant**

A 3Mva diesel generation plant will be installed to supply power to the farm in case of a power outage or load shedding. The generators will also be required for the pilot supply to the solar plant during power outages. Three synchronised

1.2Mva generators will be installed in a generator room that will also house the switchgear and invertors. All step-down and step-up transformers will be installed in the vicinity of the generator room.

### **Proposed Eskom power line**

Eskom approached the applicant with a request to have a servitude/corridor cross the breeder farm in order for them to construct three 750kV power lines from the Medupi power station to the national grid. The applicant agreed to a sale of the 226ha servitude to Eskom. This proposed activity does not form part of this Environmental Impact Assessment process and will be conducted separately by Eskom. The Eskom servitude is shown in *Figure 15* below.

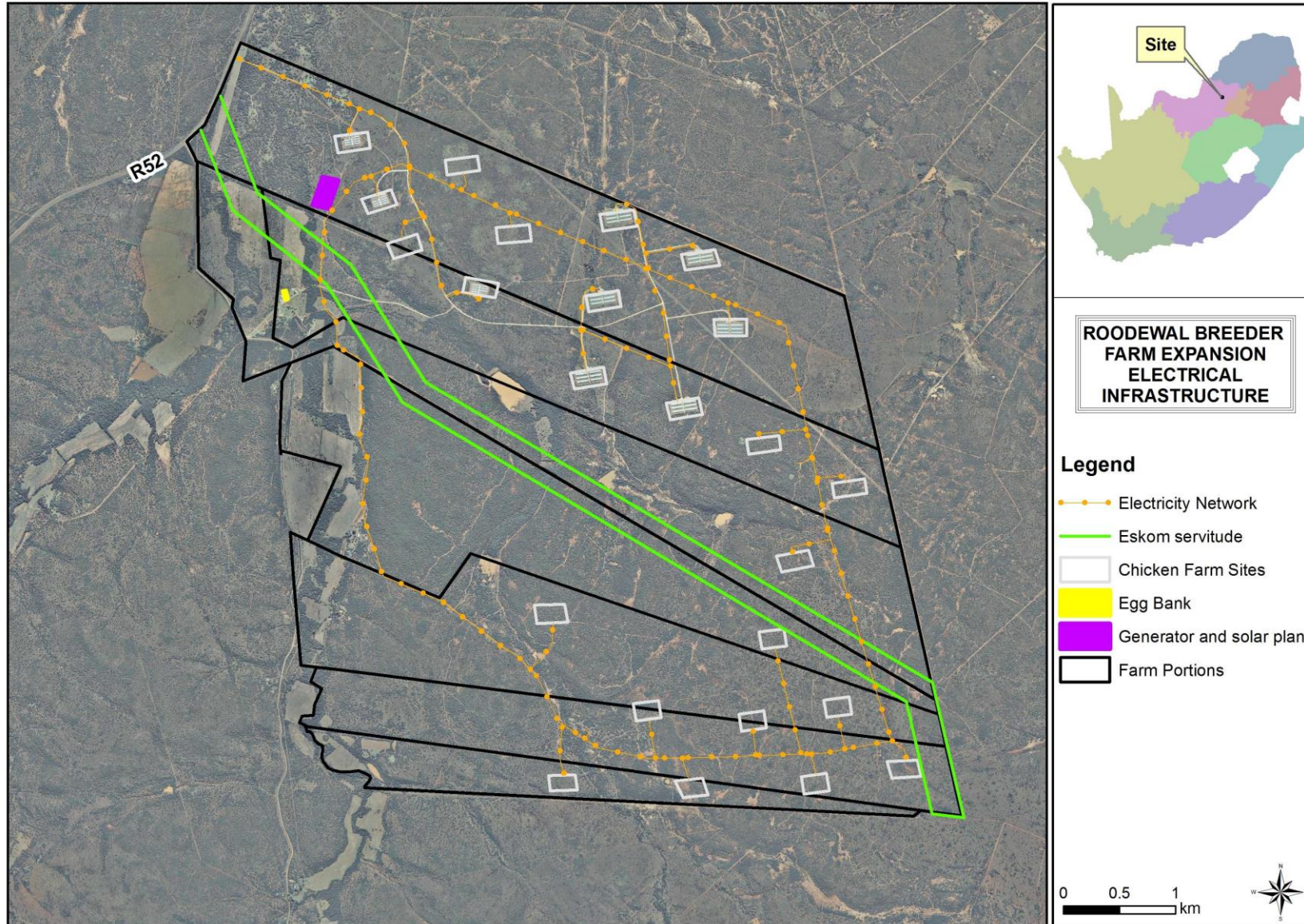


Figure 15: Electricity distribution network for the project site, including the generator and solar PV plant

## **Traffic**

There will be three entrances to the Roodewal Breeder Farm. Entrances 1 and 2 (existing) will service the Laying Farm while Entrance 3 (existing, but requiring an upgrade) will serve the Rearing Farm.

Currently, the farm receives three truckloads of feed per day and the trucks use Entrances 1 and 2. Approximately 15 light motor vehicles visit the farm per day, also using Entrances 1 and 2. Most personnel are transported by bus and there is currently one bus visiting the farm per day.

After the expansion, it is expected that Entrances 1 and 2 will receive seven truckloads of feed per day and Entrance 3 will receive three truckloads per day (10 truckloads per day in total between the three entrances). It is not expected for the number of light motor vehicles to increase. Three busses transporting personnel will be required per day after the expansion.

## **Waste**

### **Manure**

Manure will be removed from the houses as soon as possible after each cycle. This removal will include the bulk of the manure as well as the fine manure on the floor of the houses. The open area around each house, up until the perimeter fence, will also be raked to gather all the feathers. The manure, fine manure and feathers will be removed by a manure buyer to a farm where it is used as an organic fertilizer.

### **Mortalities**

Workers remove mortalities from the houses every morning and records are kept of the number of mortalities. The mortalities are taken offsite to accredited crocodile farms.

### **Domestic waste**

Domestic waste is removed from the farm once a week using a waste contractor and taken to a waste disposal site.

### **Ash**

Ash bunkers are used to store boiler ash on the farm. The bunkers are cleaned on a weekly basis and the ash will potentially be used to backfill the quarries onsite. The quarries will be fenced and rehabilitated once filled. An Ash Management Plan will also be implemented. The farm will generate ±82 tons of ash per year.

## **Housing**

### **Farm managers**

There are eight existing manager's houses on the farm and these will continue to be utilised by the production managers, maintenance staff and emergency response staff. No new housing will be built.

### **Workers**

Workers are brought to the farm every day using busses. Only emergency staff are housed on the farm, in the existing houses.

## **Personnel**

Currently there are 131 personnel working on the farm and 263 jobs will re-assigned from other existing farms to the Roodewal Breeder Farm (as other farms are sold off, the work force will be moved to the Roodewal farm). An additional 22 new, permanent jobs will also be created.

## **Fuel**

There is currently one 4m<sup>3</sup> diesel tank at the breeder farm. The applicant intends to acquire an additional 15m<sup>3</sup> diesel bowser truck for the farm.

## **Game**

The original Roodewal farm has been managed as a conservancy since 1984 and the farm has a number of game species residing on the farm. These include kudu, giraffe, wildebeest, zebra, impala, nyala, bushbuck, eland, waterbuck, red hartebeest and blesbuck. The applicant has installed six drinking and feeding stations for the game so that feed can be provided during times of drought. Tick control measures have also been installed at the feedings stations to control ticks, specifically on the kudus. The applicant intends to install five more feeding stations on the Kwa-mmatau farms (newly-acquired southern properties) in order to increase the conservancy's footprint.

## **Total land disturbance percentage**

The total land area that will be disturbed after the expansion project (this includes the existing and proposed disturbances), should the proposed project be authorised, will be  $\pm 5\%$  of the total land area of the project site (a combination of all the project properties). This is calculated as  $\pm 141.5$ ha out of the total 2 830.3021ha size of the project site.

## 5.2 Listed Activities triggered by the proposed development

The following listed activities are triggered by the proposed development and therefore require Environmental Authorisation, in terms of the Environmental Impact Assessment Regulations of 4 December 2014, as amended:

Table 1: Listed activity/activities triggered by the proposed development

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
Government Notice R983 (Listing Notice 1) Activity No. 1  Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017	The development of facilities or infrastructure for the generation of electricity from a renewable resource where- (i) the electricity output is more than 10 megawatts but less than 20 megawatts; or (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare; excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs- (a) within an urban area; or (b) on existing infrastructure.	A 10MW solar plant will be installed to generate a base load of electricity to the chicken farms.
Government Notice R983 (Listing Notice 1) Activity No. 5  Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017	The development and related operation of facilities or infrastructure for the concentration of- <del>(i) more than 1 000 poultry per facility situated within an urban area, excluding chicks younger than 20 days;</del> (ii) more than 5 000 poultry per facility situated outside an urban area, excluding chicks younger than 20 days; <del>(iii) more than 5 000 chicks younger than 20 days per facility situated within an urban area; or</del> (iv) more than 25 000 chicks younger than 20 days per facility situated outside an urban area.	Seven (7) new laying poultry farms and eight (8) new rearing poultry farms will be built. Each laying farm will consist of eight (8) houses (8 291 females and 878 males per house) and each rearing farm will consist of two (2) male houses (4 234 chickens per house) and eight (8) female houses (8 820 chickens per house). A total of 632 224 chickens can therefore be housed in new farms on the project site, at any given time. This is more than 5 000 poultry and the site is situated outside of an urban area.
Government Notice R983 (Listing Notice 1) Activity No. 9  Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	Main water supply pipelines of 200mm will be installed. From this main ring, 160mm pipelines will be installed to each chicken farm. The peak throughput will be 299litres/second.



Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
<p>Government Notice R983 (Listing Notice 1) Activity No. 24</p> <p>Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017</p>	<p>The development of a road-</p> <p>(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or</p> <p>(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p> <p>but excluding a road-</p> <p>(a) which is identified and included in activity 27 in Listing Notice 2 of 2014;</p> <p>(b) where the entire road falls within an urban area; or</p> <p>(c) which is 1 kilometre or shorter.</p>	<p>±17.5km of new gravel roads will need to be constructed onsite. The roads will be 6m wide, but may exceed 8m at turns or turning circles.</p>
<p>Government Notice R983 (Listing Notice 1) Activity No. 40</p> <p>Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017</p>	<p>The expansion and related operation of facilities for the concentration of poultry, excluding chicks younger than 20 days, where the capacity of the facility will be increased by-</p> <p><del>(i) more than 1 000 poultry where the facility is situated within an urban area; or</del></p> <p>(ii) more than 5 000 poultry per facility situated outside an urban area.</p>	<p>The current poultry farms will be expanded. This includes the expansion of the existing laying and rearing houses to increase their capacities. The existing rearing farms (on the northern part of the site) will be converted into laying farms. The existing laying and rearing farms (the rearing farms that will be converted into laying farms) will be increased to eight (8) houses per farm and the house capacities will be increased to 8 291 female chickens and 878 male chickens per house. The expansion of the existing farms will be more than 5 000 poultry and the site is situated outside of an urban area.</p>
<p>Government Notice R983 (Listing Notice 1) Activity No. 45</p> <p>Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017</p>	<p>The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure-</p> <p>(i) has an internal diameter of 0,36 metres or more; or</p> <p>(ii) has a peak throughput of 120 litres per second or more; and</p> <p>(a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or</p> <p>(b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more;</p> <p>excluding where such expansion-</p> <p>(aa) relates to transportation of water or storm water within a road reserve or railway line reserve; or</p>	<p>The existing infrastructure main water supply pipelines are 200mm and the pipelines connecting the main ring to the farms are 160mm. The peak throughput is 299litres/second.</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
<p>Government Notice R983 (Listing Notice 1) Activity No. 48</p> <p>Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017</p>	<p>(bb) will occur within an urban area.</p> <p>The expansion of-</p> <p>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or</p> <p>(ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more; where such expansion occurs-</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding-</p> <p>(aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such expansion occurs within an urban area; or</p> <p>(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.</p>	<p>Existing canals, channels, bridges, dams, weirs or bulk stormwater outlet structures may need to be upgraded and/or expanded by 100m<sup>2</sup> or more, within/across a watercourse, in front of a development setback and/or within 32 metres of a watercourse.</p>
<p>Government Notice R983 (Listing Notice 1) Activity No. 67</p> <p>Amended by Government Notice 327 (Listing Notice 1) of 7 April 2017</p>	<p>Phased activities for all activities-</p> <p>(i) listed in this Notice, which commenced on or after the effective date of this Notice or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; excluding the following activities listed in this Notice-</p> <p>17(i)(a-d); 17(ii)(a-d); 17(iii)(a-d); 17(iv)(a-d); 17(v)(a-d); 20; 21; 22; 24(i); 29; 30; 31; 32; 34; 54(i)(a-d); 54(ii)(a-d); 54(iii)(a-d); 54(iv)(a-d); 54(v)(a-d); 55; 61; 64; and 65; or</p> <p>(ii) listed as activities 5, 7, 8(ii), 11, 13, 16, 27(i) or 27(ii) in Listing Notice 2 of 2014 or similarly</p>	<p>The proposed development will be undertaken in a number of phases over a ±5 year period.</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
	<p>listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.</p>	
<p>Government Notice R984 (Listing Notice 2) Activity No. 6</p> <p>Amended by Government Notice 325 (Listing Notice 2) of 7 April 2017</p>	<p>The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding-</p> <p>(i) activities which are identified and included in Listing Notice 1 of 2014;</p> <p>(ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;</p> <p>(iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or</p> <p>(iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.</p>	<p>The proposed development will require a Water Use Licence application, in terms of the National Water Act, 1998, for one or more of the following proposed water use activities:</p> <ul style="list-style-type: none"> <li>• Section 21(a) - abstraction of groundwater from four onsite boreholes;</li> <li>• Section 21(b) - the storage of clean water in a number of dams and reservoirs onsite;</li> <li>• Section 21(c) - development/construction across watercourses and within 500m from the boundary of watercourses onsite;</li> <li>• Section 21(f) - release of treated water from the proposed wastewater treatment plant into the environment;</li> <li>• Section 21(g) - the treatment of sewage, wastewater and wash water in a proposed wastewater treatment plant; and</li> <li>• Section 21(i) - development/construction across watercourses and within 500m from the boundary of watercourses onsite.</li> </ul>
<p>Government Notice R984 (Listing Notice 2) Activity No. 15</p> <p>Amended by Government Notice 325 (Listing Notice 2) of 7 April 2017</p>	<p>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>±124ha of vegetation will be cleared for the proposed development. The development will not only consist of linear activities. The total combined size of the project properties is 2 830.3021ha.</p>
<p>Government Notice R985</p>	<p>The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.</p>	<p>Two new 320m<sup>3</sup> water reservoirs will be constructed. Although the proposed localities</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
(Listing Notice 3) Activity No. 2  Amended by Government Notice 324 (Listing Notice 3) of 7 April 2017	<b>h. North West</b> iii. All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act No. 25 of 1999).	for the reservoirs are not currently situated within heritage sites, this activity has been included as there are heritage sites in the wider vicinity and should localities change, these sites may be impacted upon.
Government Notice R985 (Listing Notice 3) Activity No. 4  Amended by Government Notice 324 (Listing Notice 3) of 7 April 2017	The development of a road wider than 4 metres with a reserve less than 13,5 metres. <b>h. North West</b> iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority. vi. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve. viii. All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act No. 25 of 1999).	±17.5km of new gravel roads will need to be constructed onsite. The roads will be 6m wide, but may exceed 8m at turns or turning circles. The project properties are outside of an urban area and some of the roads will be constructed on land that is designated as Critical Biodiversity Area 2 in terms of the North West Biodiversity Assessment.  The project site is situated within the Transition Zone of the Magaliesberg Biosphere Reserve (the project site is situated further than 5km from the core area of the Magaliesberg Biosphere Reserve).  The proposed gravel roads are in the vicinity of heritage sites and this activity has therefore been included in the event that any heritage sites may be impacted upon.
Government Notice R985 (Listing Notice 3) Activity No. 12  Amended by Government Notice 324 (Listing Notice 3) of 7 April 2017	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 a maintenance management plan. <b>h. North West</b> iii. All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act No. 25 of 1999); iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority; vi. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.	±124ha of vegetation will be cleared for the proposed development.  A number of heritage sites will be impacted upon by the proposed development.  Part of this area to be cleared is land which is designated as Critical Biodiversity Area 2 in terms of the North West Biodiversity Assessment. Development footprints, such as roads, may also cross over drainage lines and/or wetlands.
Government Notice R985	The development of- (i) dams or weirs, where the dam or weir,	As part of the proposed development, one or more of the following will be developed

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
(Listing Notice 3) Activity No. 14  Amended by Government Notice 324 (Listing Notice 3) of 7 April 2017	<p>including infrastructure and water surface area exceeds 10 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs-</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse, excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p><b>h. North West</b></p> <p>iii. All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act No. 25 of 1999);</p> <p>iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.</p>	<p>within/across a watercourse, in front of a development setback and/or within 32 metres of a watercourse:</p> <ul style="list-style-type: none"> <li>• canals exceeding 100 square metres in size;</li> <li>• channels exceeding 100 square metres in size;</li> <li>• bridges exceeding 100 square metres in size;</li> <li>• dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size;</li> <li>• weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size;</li> <li>• bulk storm water outlet structures exceeding 100 square metres in size;</li> <li>• buildings exceeding 100 square metres in size;</li> <li>• boardwalks exceeding 100 square metres in size; and</li> <li>• infrastructure or structures with a physical footprint of 100 square metres or more.</li> </ul> <p>The project properties are outside of an urban area and are mostly situated in an Ecological Support Area 1 in terms of the North West Biodiversity Assessment, with some of the land also being designated as Critical Biodiversity Area 2 in terms of the North West Biodiversity Assessment.</p> <p>A number of heritage sites will be impacted upon by the proposed development.</p>
Government Notice R985 (Listing Notice 3) Activity No. 18  Amended by Government Notice 324 (Listing Notice 3) of 7 April 2017	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p><b>h. North West</b></p> <p>ii. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;</p> <p>v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;</p>	<p>Existing gravel roads will be widened by more than 4m and/or more than 1km. The project site is situated within the Transition Zone of the Magaliesberg Biosphere Reserve (the project site is situated further than 5km from the core area of the Magaliesberg Biosphere Reserve).</p> <p>The project properties are outside of an urban area and some of the land on which the roads</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
	<p>viii. All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act No. 25 of 1999);</p> <p>ix. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.</p>	<p>will be expanded is designated as a Critical Biodiversity Area 2 in terms of the North West Biodiversity Assessment.</p> <p>The proposed widening and lengthening of the roads will occur in the vicinity of heritage sites and this activity has therefore been included in the event that any heritage sites may be impacted upon.</p> <p>The widening and lengthening of the roads may occur across watercourses and/or wetlands or within 100 metres from the edge of watercourses and/or wetlands.</p>
<p>Government Notice R985 (Listing Notice 3) Activity No. 23</p> <p>Amended by Government Notice 324 (Listing Notice 3) of 7 April 2017</p>	<p>The expansion of-</p> <p>(i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or</p> <p>(ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;</p> <p>where such expansion occurs-</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback adopted in the prescribed manner; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p><b>h. North West</b></p> <p>iii. All Heritage Sites proclaimed in terms of National Heritage Resources Act, 1999 (Act No. 25 of 1999);</p> <p>iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.</p>	<p>As part of the proposed development, one or more of the following may be expanded upon by 10m<sup>2</sup> or more, within/across a watercourse, in front of a development setback and/or within 32 metres of a watercourse:</p> <ul style="list-style-type: none"> <li>• canals;</li> <li>• channels;</li> <li>• bridges;</li> <li>• dams;</li> <li>• weirs;</li> <li>• bulk storm water outlet structures;</li> <li>• buildings;</li> <li>• boardwalks; and</li> <li>• infrastructure or structures.</li> </ul> <p>A number of heritage sites within a watercourse, in front of a development setback and/or within 32 metres of a watercourse may be impacted upon by the proposed development.</p> <p>The project properties are outside of an urban area and are mostly situated in an Ecological Support Area 1 in terms of the North West Biodiversity Assessment, with some of the land also being designated as Critical Biodiversity Area 2 in terms of the North West Biodiversity Assessment.</p>
<p>Government Notice R985</p>	<p>Phased activities for all activities -</p> <p>i. listed in this Notice and as it applies to a</p>	<p>The proposed development will be undertaken in a number of phases over a ±5 year period.</p>

Government Notice and Activity Number	Wording as per the Listing Notice	Description as per the project description relating to each listed activity
(Listing Notice 3) Activity No. 26  Amended by Government Notice 324 (Listing Notice 3) of 7 April 2017	specific geographical area, which commenced on or after the effective date of this Notice; or ii. similarly listed in any of the previous NEMA notices, and as it applies to a specific geographical area, which commenced on or after the effective date of such previous NEMA Notices- where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold;- excluding the following activities listed in this Notice- 7; 8; 11; 13; 20; 21; and 24.	

### 5.3 Water Use Licence Activities

The following proposed water uses require Water Use Registration and/or Licence applications in terms of Chapter 4 of the National Water Act, 1998 (Act No. 36 of 1998):

- Section 21(a): Taking water from a water resource – abstraction of groundwater from four onsite boreholes;
- Section 21(b): Storage of water – the storage of clean water in a number of dams and reservoirs onsite;
- Section 21(c): Impeding or diverting the flow of water in a watercourse – development/construction across watercourses and within 500m from the boundary of watercourses onsite;
- Section 21(f): Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit – release of treated water from the proposed wastewater treatment plant into the environment;
- Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource – the treatment of sewage, wastewater and wash water in a proposed wastewater treatment plant; and
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse - development/construction across watercourses and within 500m from the boundary of watercourses onsite.

The required Water Use Registration and/or Licence application will be submitted to the Department of Water and Sanitation in due course.

### 5.4 Environmental sensitivity overlay map - Map at an appropriate scale that superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.

Please refer to *Figure 16* and *Figure 17* below.

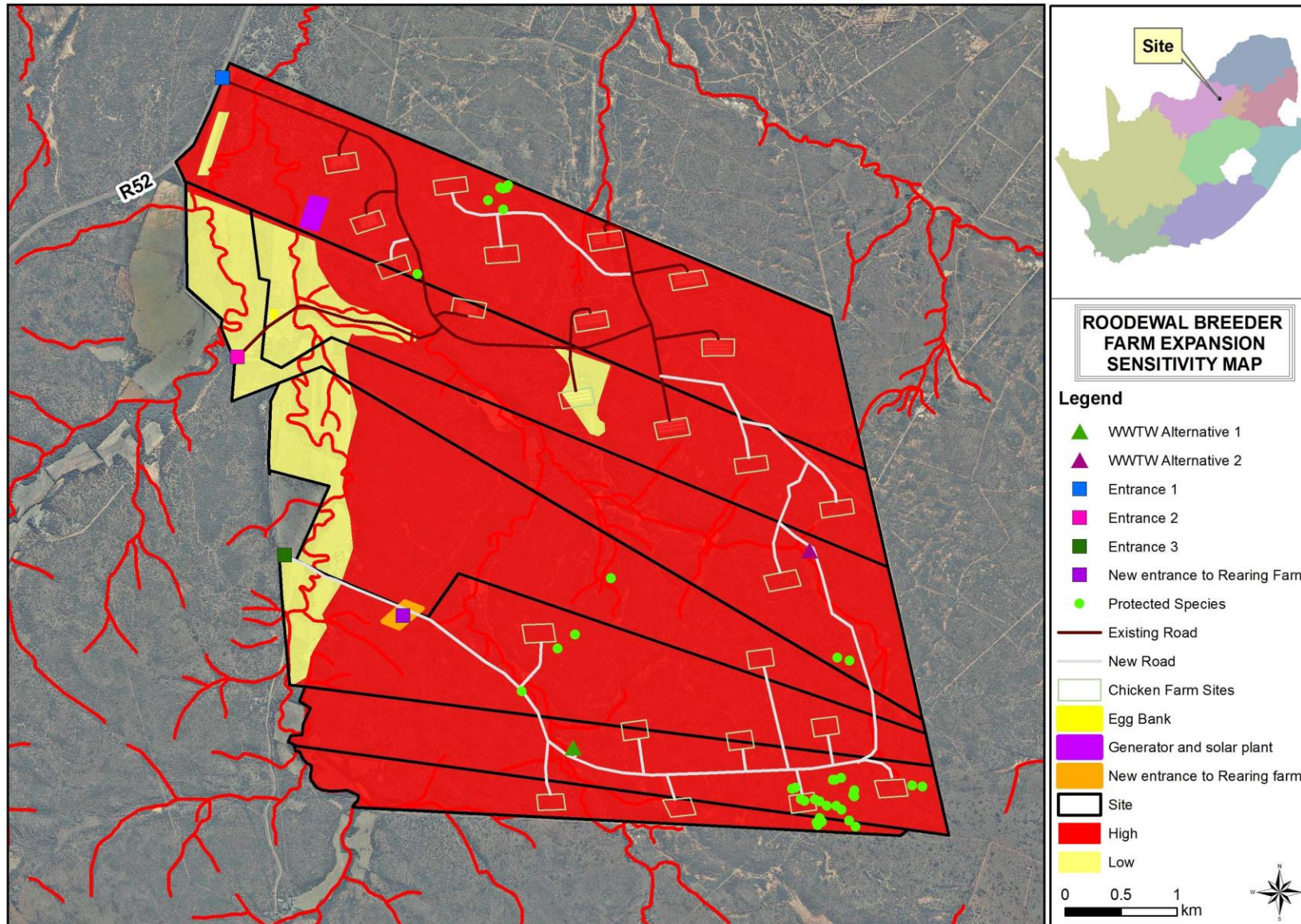


Figure 16: Vegetation sensitivity map of the project site



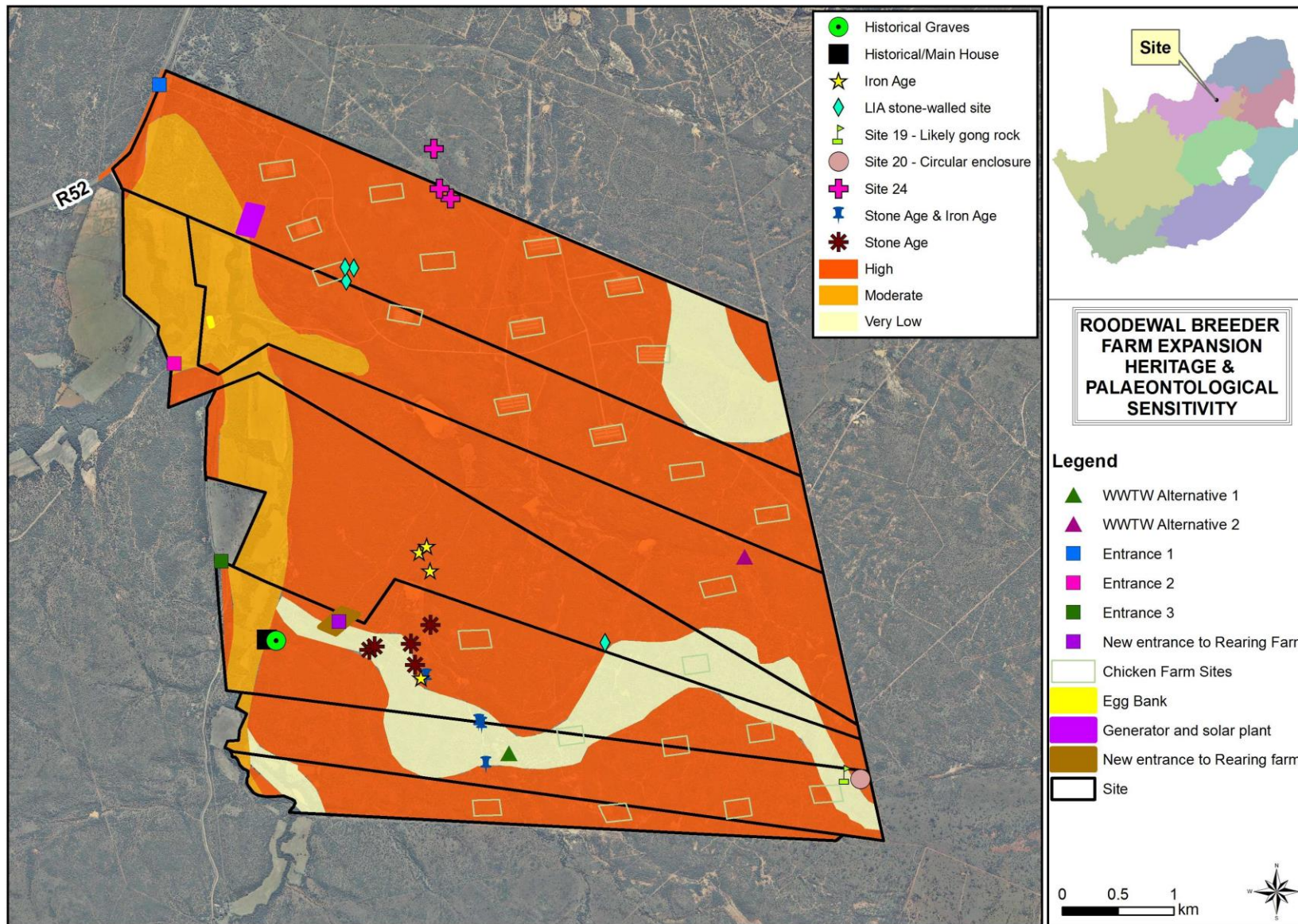


Figure 17: Heritage and Palaeontological Sensitivity of the project site

## 6. POLICY AND LEGISLATIVE CONTEXT OF THE APPLICATION

The following legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments are applicable to the proposed development and have been considered in this Environmental Impact Assessment process. The mitigation measures proposed in this Environmental Management Programme are also aligned with the provisions of the relevant sections of legislation.

### Legislation

- The Constitution of South Africa, 1996 (Act No. 108 of 1996), as amended
- The National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended
- The Environmental Impact Assessment Regulations of 4 December 2014, as amended
- The National Water Act, 1998 (Act No. 36 of 1998), as amended
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), as amended
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999), as amended
- The National Appeal Regulations – Government Notice No. R.993 of 8 December 2014

### Plans

- North West Biodiversity Sector Plan, 2015
- North West Province Biodiversity Conservation Assessment Technical Report. Version 1.2
- Magaliesberg MPE: Draft Environmental Management Framework and Plan, 2007

### Guidelines

- Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010

### Spatial tools

- SANBI Biodiversity GIS Database

### Municipal development planning frameworks

- Kgetlengrivier Local Municipality – Spatial Development Framework Final Draft – March 2012
- Kgetlengrivier Local Municipality – Integrated Development Plan 2017 (2012-2017)
- Kgetlengrivier Local Municipality – Annual Report June 2013

## 7. DESCRIPTION OF IMPACT MANAGEMENT OUTCOMES, MANAGEMENT STATEMENTS AND IMPACTS AND RISKS THAT NEED TO BE AVOIDED, MANAGED AND/OR MITIGATED

### 7.1 Impact Management Outcomes

Please refer to *Table 2* under Section 8 below.

### 7.2 Impact Management Statements

The applicant, RCL Foods Limited, commits to implementing the mitigation actions contained in this Environmental Management Programme in order to ensure that the environmental impacts from the proposed development are minimised.

### 7.3 Impacts and risks that need to be avoided, managed and/or mitigated

The following impacts and risks have been identified for the preferred alternative and need to be avoided, managed and/or mitigated:

#### Planning and Design Phase

- Inadequate planning and design of the breeder farm that could result in environmental impacts that could have been avoided.

#### Pre-construction Phase

- Unsafe working conditions.
- Workers being unaware of the dangers of working at the construction site, resulting in a risk to their safety.

### Wetlands

#### Construction Phase

- Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow. The sources of this impacts include:
  - The compaction of soil;
  - The removal of vegetation;
  - Surface water redirection; and
  - The construction of infrastructure.
- Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount). Construction, operational and decommissioning activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include:
  - Earthwork activities during construction of the chicken runs and associated infrastructure such as access roads;
  - Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soils;
  - Disturbance of the soil surface;
  - Disturbance of slopes through the creation of roads and tracks adjacent to the watercourses; and
  - Erosion (e.g. gully formation and bank collapse).
- Introduction and spread of alien vegetation. The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a wetland, and outcompete natural vegetation,

decreasing the natural biodiversity. Once in a system, alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users.

- Changes in water quality due to foreign materials and increased nutrients impact ratings. Construction, operational and decommissioning activities will result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/streams and a reduction in wetland function as well as human and animal waste. Could possibly impact on groundwater.
- Establishment of an artificial wetland ecosystem, linked to the proposed wastewater treatment plant. Provision of a habitat for fauna species.

### **Operational Phase**

- Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow. The sources of this impacts include:
  - The compaction of soil;
  - The removal of vegetation;
  - Surface water redirection; and
  - The construction of infrastructure.
- Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount). Construction, operational and decommissioning activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include:
  - Earthwork activities during construction of the chicken runs and associated infrastructure such as access roads;
  - Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soils;
  - Disturbance of the soil surface;
  - Disturbance of slopes through the creation of roads and tracks adjacent to the watercourses; and
  - Erosion (e.g. gully formation and bank collapse).
- Introduction and spread of alien vegetation. The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a wetland, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system, alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plants can easily colonise and impact on downstream users.
- Changes in water quality due to foreign materials and increased nutrients impact ratings. Construction, operational and decommissioning activities will result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/streams and a reduction in wetland function as well as human and animal waste. Could possibly impact on groundwater.
- Management of an artificial wetland ecosystem. Provision of a habitat for fauna species.

### **Post-construction and Rehabilitation Phase**

None anticipated.

### **Cumulative**

- Should mitigation measure not be implemented and changes made to the bed or banks of watercourse unstable channel conditions may result causing erosion, meandering, increased potential for flooding and movement of bed

material, which will result in property damage adjacent to and downstream of the site. Reversing this process is unlikely and should be prevented in the first place. Expected to be moderate.

- Construction areas within the watercourses along the proposed servitude can experience an increased alien invasion if mitigation is not implemented or implemented correctly. Regular monitoring should be implemented during construction, rehabilitation including for a period after rehabilitation is completed. Expected to be moderate to high.
- Once in the system it may take many years for some toxins to be eradicated. Expected to be moderate.

## Surface and Groundwater

### Construction Phase

- Pollution of surface and/or groundwater resources due to the potential release of pollutants, such as chemicals.
- Pollution of surface and/or groundwater resources due to the incorrect management of chemical substances and dangerous goods.
- Pollution of surface and/or groundwater resources due to poor waste management.
- Pollution of surface and/or groundwater resources due to runoff of contaminated stormwater.
- Pollution of surface and/or groundwater resources due to the incorrect management of concrete mixing.

### Operational Phase

- Pollution of surface and/or groundwater resources due to the incorrect management of chemical substances and dangerous goods.
- Pollution of surface and/or groundwater resources due to the potential release of wastewater (sewage and wash water).
- Pollution of surface and/or groundwater resources due to poor waste management.
- Unsustainable utilisation of groundwater.
- Pollution of surface and/or groundwater resources due to runoff of contaminated stormwater.

### Post-construction and Rehabilitation Phase

None anticipated.

### Cumulative

None anticipated.

## Fauna

### Construction Phase

- Direct impact on mammal and herpetofaunal communities: The construction of the chicken farms will each displace natural habitat over a small area, and relative to the 3 200 hectares extent of the property, will be insignificant.
- Loss of mammal and herpetofaunal habitat and ecological structure: The construction of the chicken farms will entirely displace natural habitats.
- Loss of avian habitats: Depending on the size of the chicken facilities, an area in the region of 100ha of avian habitats comprising mainly “randjiesveld” woodland will be destroyed by the proposed development. The construction of road network will result in additional losses. This will represent a moderate loss of habitat and is unlikely to significantly negatively impact bird communities at the site or in the region.
- Increased disturbance of birds by human activities: In addition to direct habitat loss, the disturbance of birds in the surrounding areas will increase because of increased human activity and movements in the area. This impact will be more pronounced during the construction phase than the operational phase.

- Mortality associated with new roads linking the chicken facilities: Vehicles using the roads will result in an increased mortality risk for birds, mammals, reptiles and amphibians through collisions with moving vehicles.
- Environmental contamination, including disease transmission from chickens to wild birds: The new chicken facilities will create a risk of contamination of natural habitats in the surrounding areas if spillages of substances such as chicken manure occur. A related risk concerns the possibility of contact between chickens and wild birds and the possibility of disease transmission subsequently occurring.
- Power lines: collision and electrocution risk to birds: It is assumed that new distribution lines will need to be constructed to provide power to the chicken facilities. These will create electrocution and collisions risks for birds, although these will be minor compared to those associated with large transmission lines.

### **Operational Phase**

- Direct impact on mammal and herpetofaunal communities: The construction of the chicken farms will each displace natural habitat over a small area, and relative to the 3 200 hectares extent of the property, will be insignificant.
- Loss of mammal and herpetofaunal habitat and ecological structure: The construction of the chicken farms will entirely displace natural habitats.
- Loss of avian habitats: Depending on the size of the chicken facilities, an area in the region of 100ha of avian habitats comprising mainly “randjiesveld” woodland will be destroyed by the proposed development. The construction of road network will result in additional losses. This will represent a moderate loss of habitat and is unlikely to significantly negatively impact bird communities at the site or in the region.
- Increased disturbance of birds by human activities: In addition to direct habitat loss, the disturbance of birds in the surrounding areas will increase because of increased human activity and movements in the area. This impact will be more pronounced during the construction phase than the operational phase.
- Mortality associated with new roads linking the chicken facilities: Vehicles using the roads will result in an increased mortality risk for birds, mammals, reptiles and amphibians through collisions with moving vehicles.
- Environmental contamination, including disease transmission from chickens to wild birds: The new chicken facilities will create a risk of contamination of natural habitats in the surrounding areas if spillages of substances such as chicken manure occur. A related risk concerns the possibility of contact between chickens and wild birds and the possibility of disease transmission subsequently occurring.
- Power lines: collision and electrocution risk to birds: It is assumed that new distribution lines will need to be constructed to provide power to the chicken facilities. These will create electrocution and collisions risks for birds, although these will be minor compared to those associated with large transmission lines.

### **Post-construction and Rehabilitation Phase**

None anticipated.

### **Cumulative**

- The proposed development will result in additional avifaunal habitat loss in the region. However, the small area involved means that this impact is minor.
- Increased disturbance at a local scale, but unlikely to be significant.
- Increased road kill mortality at a local scale, but unlikely to be significant.
- Poultry farms, by their nature, elevate the risk of disease transmission between wild and domestic species. However, as long as adequate biosecurity measures are put in place, the cumulative impact should not be cause for concern.

## Flora

### Construction Phase

- Removal of natural, good condition vegetation:
  - Destruction of vegetation;
  - Potential loss of individuals of large tree species and associated microhabitats;
  - Potential loss of species of conservation concern and their habitats;
  - Potential increase in runoff and erosion;
  - Potential spread of alien invasive vegetation; and
  - Potential contamination of soils with hydrocarbons and/or other pollutants.
- Erosion, soil compaction and subsequent sedimentation:
  - Soil compaction;
  - Potential increase in runoff and erosion;
  - Possible change of natural runoff and drainage patterns;
  - Possible permanent loss of revegetation potential of soil surface;
  - Potential spread of alien invasive vegetation; and
  - Negative impact on indigenous species' growing conditions.
- Removal of protected species or species of conservation concern:
  - Potential loss of individuals or populations of conservation concern; and
  - Changes in species composition.
- Invasion by alien invasive plant species:
  - Increase in alien invasive plant species and densities on the site.
- Bush densification:
  - Increase in bush encroacher species; and
  - Change in vegetation structure.
- Deterioration of watercourses and riparian vegetation:
  - Destruction of vegetation;
  - Deterioration of vegetation and watercourse; and
  - Potential contamination of soils with hydrocarbons and/or other pollutants.

### Operational Phase

- Invasion by alien invasive plant species:
  - Increase in alien invasive plant species and densities on the site.
- Bush densification:
  - Increase in bush encroacher species; and
  - Change in vegetation structure.

### Post-construction and Rehabilitation Phase

None anticipated.

### Cumulative

- Removal of natural, good condition vegetation:
  - Possible erosion of surrounding areas if no mitigation is implemented;
  - Possible increased fragmentation of remaining natural vegetation;
  - Possible bush densification or invasion by alien invasive plant species; and
  - Possible expansion of the chicken farm with additional infrastructure and chicken houses that will increase fragmentation and impact on the vegetation composition and structure.

- Erosion, soil compaction and subsequent sedimentation:
  - Sedimentation;
  - Possible bush densification or invasion by alien invasive plant species;
  - Further fragmentation of natural habitats;
  - Altered topsoil conditions; and
  - Potential barren areas remaining after construction.
- Removal of protected species or species of conservation concern:
  - Loss of diversity;
  - Decline in provincial or national numbers of species of conservation concern; and
  - Future expansion of the chicken farm will lead to a further reduction in these species and fragmentation and should therefore be prohibited.
- Invasion by alien invasive plant species:
  - Increase in alien invasive plant species in the area that the site is situated in; and
  - Loss of indigenous species diversity.
- Bush densification:
  - Possible bush densification on the site and loss of indigenous species diversity.
- Deterioration of watercourses and riparian vegetation:
  - Possible loss of the ecological function of riparian vegetation and erosion of riverbanks;
  - Decrease in water quality; and
  - Flooding downstream.

## Heritage Resources

### Construction Phase

Disturbance or destruction of cultural and heritage resources.

### Operational Phase

Disturbance or destruction of cultural and heritage resources.

### Post-construction and Rehabilitation Phase

None anticipated.

### Cumulative

Disturbance or destruction of cultural and heritage resources onsite resulting in a decline in the overall cultural and heritage value of the greater area.

## Palaeontological resources

### Construction Phase

- High possibility that significant micro-organism fossil remains may be present in the Silverton Formation parts of the site. The alluvium areas may also contain significant fossils not yet recorded for the area. Stromatolitic structures may be uncovered if bedrock is exposed during foundation excavations.

### Operational Phase

None anticipated.

### Post-construction and Rehabilitation Phase

None anticipated.



### Cumulative

None anticipated.

## Air Quality and Noise

### Construction Phase

- Generation of dust.
- Release of vehicle emissions from construction vehicles.
- Generation of nuisance and noise.

### Operational Phase

- Generation of emissions, such as carbon dioxide, carbon monoxide, sulphur dioxide and nitrous oxides, from coal hot water boilers.

### Post-construction and Rehabilitation Phase

None anticipated.

### Cumulative

The greenhouse gas emissions from the vehicles and coal hot water boilers will combine with other greenhouse gasses in the atmosphere and contribute towards the global Climate Change effect.

## Soil

### Construction Phase

- Soil erosion due to the clearance of vegetation.
- Soil compaction to create foundations for buildings and other associated infrastructure.
- Soil pollution due to the incorrect management of chemical substances and dangerous goods.
- Soil pollution due to poor waste management (general and hazardous waste).
- Soil pollution due to potential spillages from chemical toilets.
- Soil pollution due to the incorrect management of concrete mixing.
- Soil pollution due to runoff of contaminated stormwater.

### Operational Phase

- Soil pollution due to the incorrect management of chemical substances and dangerous goods.
- Soil pollution due to poor waste management (general and hazardous waste).
- Soil pollution due to runoff of contaminated stormwater.

### Post-construction and Rehabilitation Phase

- Soil erosion due to inefficient rehabilitation of construction areas.

### Cumulative

None anticipated.

## Socio-economic

### Construction Phase

- Generation of a large number of job opportunities.
- The stimulation of the local and provincial economy and supply chain industries.
- Potential increase in crime due to the influx of workers.

### **Operational Phase**

- Generation of a large number of job opportunities.
- The stimulation of the local and provincial economy and supply chain industries.
- Contributing to food security in South Africa.

### **Post-construction and Rehabilitation Phase**

- The stimulation of the local and provincial economy and supply chain industries.
- Generation of a number of job opportunities.

### **Cumulative**

None anticipated.

## **Traffic**

### **Construction Phase**

- Increase in traffic volumes to the site

### **Operational Phase**

- Increase in traffic volumes to the site

### **Post-construction and Rehabilitation Phase**

None anticipated.

### **Cumulative**

None anticipated.

## **8. DESCRIPTION OF PROPOSED IMPACT MANAGEMENT ACTIONS (ENVIRONMENTAL MANAGEMENT PROGRAMME ACTIONS)**

### **8.1 Impact Management Outcome and Action Table**

Please refer to *Table 2* below.

Table 2: Environmental Management Programme - Impact Management Outcome and Action Table

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
<b>Planning and Design Phase</b>					
Planning and design of the breeder farm expansion.	Inadequate planning and design of the breeder farm that could result in environmental impacts that could have been avoided.	To effectively plan and design the breeder farm in order to minimise operational impacts.		<b>Site selection</b> <b>Flora</b> <ul style="list-style-type: none"> <li>Plan the layout to avoid areas of high sensitivity. Due to the high sensitivity and good ecological condition of most of the vegetation on site, these areas must be avoided as far as possible and fragmentation of the habitat limited as much as possible.</li> <li>Plan the layout to make use of existing disturbed areas, focusing on areas of low sensitivity and then as little portion of high sensitivity situated close to the low sensitivity areas as possible.</li> <li>No areas of high sensitivity should be unduly fragmented.</li> <li>Plan to keep as many large trees intact as possible. Plan the layout to take cognisance of the localities of these trees.</li> <li>Ideally, an on-site ecologist should be present when excavation takes place to ensure that any uncovered species of conservation concern are protected from destruction. Note that the species could be dormant until favourable conditions arise.</li> <li>An ecologically sound, storm water management plan must be implemented.</li> <li>A suitably qualified person (e.g. botanist/horticulturist) should survey the final layout within the growing season of the plants (summer months, preferably between November and February), in order to confirm whether these plants occur within the development footprint. The layout should be flexible to avoid these species were recorded.</li> <li>Implement a Plant Rescue and Rehabilitation Plan: Where the plants of conservation concern are deemed to be under threat from the construction activities, the plants should be removed (if they could survive this process) by a suitably qualified specialist and replanted as part of vegetation rehabilitation after the construction (Note that these plants may only be removed with the permission of the provincial authority).</li> <li>Ideally, an on-site ecologist should be present when excavation takes place to ensure that any species not identified during the EIA phase are protected from destruction. Note that the species could be dormant for some time until favourable conditions arise.</li> <li>Alien invasive species that were identified within the study area should be removed prior to construction-related soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could therefore have a positive impact on the surrounding natural vegetation.</li> <li>A 100m buffer around the rivers on the site is recommended in which no development should take place, with the minimum buffer area of 15m as recommended by the wetland specialists (Limosella Consulting, 2017).</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Engineer</li> <li>Ecologist</li> <li>Botanist/Horticulturist</li> </ul>
<b>Pre-Construction Phase</b>					
Construction site establishment.	Unsafe working conditions.	To ensure that the construction site is operated in a safe and responsible manner for the duration of the construction phase.		<ul style="list-style-type: none"> <li>The construction site must be demarcated (fenced or delineated with danger tape). As the project properties are fenced and strict access control is ensured at the facility, no public access to construction areas will be possible.</li> <li>A site plan must be drawn up by the construction contractor and kept on file. The site plan must show proposed stockpile areas, waste storage areas and ablution facilities.</li> <li>Signage indicating that the site is a "Construction Site" and indicating the risks associated with the site must be displayed. Emergency numbers, "No-smoking" signs and "No Open Flame" signs must also be displayed at the construction site.</li> <li>Fire-fighting equipment must be placed at the construction site and must be easily accessible.</li> <li>The fire-fighting equipment must be maintained on a yearly basis.</li> <li>Welding, hot-work and flame-cutting may not be conducted close to fuel storage tanks. Where such activities are undertaken, fire-fighting equipment must be at hand.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Appointment of workers (employees and contractors) to commence construction activities onsite.	Workers being unaware of the impact that their activities may have on the environment.	To adequately educate workers (employees and contractors) regarding environmental awareness.		<ul style="list-style-type: none"> <li>Before any employees or contractors commence work at the breeder farm, each individual must undergo an Induction Training session that will cover the aspects as detailed in the Environmental Awareness Plan (contained in this EMPr). Attendance registers must be completed and kept on file.</li> <li>Employees and contract workers must be issued with suitable Personal Protective Equipment (PPE), as applicable to each persons' job onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Wetlands Construction Phase</b>					

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
Changing the quantity and fluctuation properties of the watercourse.	Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow. The sources of this impacts include: <ul style="list-style-type: none"> <li>The compaction of soil;</li> <li>The removal of vegetation;</li> <li>Surface water redirection; and</li> <li>The construction of infrastructure.</li> </ul>	To minimise and avoid changes to the quantity and fluctuation properties of the watercourses onsite.		<ul style="list-style-type: none"> <li>No activities should take place in the watercourses and associated buffer zone (15m). Where the above is unavoidable, only the construction footprint and no access roads can be considered. This is subjected to authorisation by means of a Water Use License.</li> <li>Construction must be restricted to the dryer winter months where possible.</li> <li>A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse.</li> <li>Effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMPr. High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) on the site above the river/wetland area resulting from the proposed chicken farm development should be taken into account.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount).	Construction activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include: <ul style="list-style-type: none"> <li>Earthwork activities during construction of the chicken farm and associated infrastructure such as access roads;</li> <li>Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soils;</li> <li>Disturbance of the soil surface;</li> <li>Disturbance of slopes through the creation of roads and tracks adjacent to the watercourses; and</li> <li>Erosion (e.g. gully formation and bank collapse).</li> </ul>	To prevent changes to the amount of sediment entering the water resources onsite.		<ul style="list-style-type: none"> <li>Water may seep into earthworks. It is likely that water will be contaminated within these earthworks and should therefore be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water, thereby reducing the risk of erosion. Effective sediment traps should be installed.</li> <li>Construction in and around watercourses must be restricted to the dryer winter months where possible.</li> <li>Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area (DWAF, 2005).</li> <li>Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.</li> <li>Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction.</li> <li>Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.</li> <li>During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation.</li> <li>Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.</li> <li>Runoff from the construction area must be managed to avoid erosion and pollution problems.</li> <li>Implementation of best management practices.</li> <li>Source-directed controls.</li> <li>Buffer zones to trap sediments.</li> <li>Monitoring should be done to ensure that sediment pollution is timeously dressed.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Introduction and spread of alien vegetation.	The movement of soil and vegetation results in opportunistic invasions after disturbance, as well as through the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of	To prevent the introduction and spread of alien vegetation.		<ul style="list-style-type: none"> <li>Weed control should be implemented.</li> <li>Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area and returning it where possible afterwards.</li> <li>Monitor the establishment of alien invasive species within the areas affected by the construction activities and maintenance and take immediate corrective action where invasive species are observed to establish.</li> <li>Rehabilitate or re-vegetate disturbed areas.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
	water entering a wetland, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system, alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented, alien plants can easily colonise and impact on downstream users.				
Changes in water quality due to foreign materials and increased nutrients impact ratings.	Construction activities will likely result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/riparian area and a reduction in wetland function. This could possibly also impact on groundwater.	To prevent changes in water quality due to foreign materials and increased nutrients impact ratings.		<ul style="list-style-type: none"> <li>• Provision of adequate sanitation facilities located outside of the watercourse/riparian area or its associated buffer zone (15m).</li> <li>• Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.</li> <li>• The development footprint must be fenced off from the watercourse and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc.</li> <li>• After construction, the land must be cleared of rubbish, surplus materials and equipment and all parts of the land shall be left in a condition as close as possible to that prior to use.</li> <li>• Maintenance of construction vehicles/equipment should not take place within the watercourse or watercourse buffer.</li> <li>• Control of waste discharges.</li> <li>• Maintenance of buffer zones to trap sediments with associated toxins</li> <li>• Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse.</li> <li>• Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects.</li> <li>• Control of waste discharges. Do not allow dirty water from construction activities to enter the watercourse.</li> <li>• Treatment of pollution identified should be prioritised accordingly.</li> <li>• During decommissioning activities, workers are not allowed to use watercourse and associated buffers as ablution facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Construction of the wastewater treatment plant.	Establishment of an artificial wetland ecosystem, linked to the proposed wastewater treatment plant. Provision of a habitat for fauna species.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
<b>Operational Phase</b>					
Changing the quantity and fluctuation properties of the watercourse.	Changing the quantity and fluctuation properties of the watercourse by, for example, storm water input, or restricting water flow. The sources of this impacts include: <ul style="list-style-type: none"> <li>• The compaction of soil;</li> <li>• The removal of vegetation;</li> <li>• Surface water redirection; and</li> <li>• The construction of infrastructure.</li> </ul>	To minimise and avoid changes to the quantity and fluctuation properties of the watercourses onsite.		<ul style="list-style-type: none"> <li>• Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount).	Operational activities will result in earthworks and soil disturbance as well as the removal of natural vegetation. This could result in the loss of topsoil, sedimentation of the wetland and increase the turbidity of the water. Possible sources of the impacts include:	To prevent changes to the amount of sediment entering the water resources onsite.		<ul style="list-style-type: none"> <li>• Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
	<ul style="list-style-type: none"> <li>Disturbance of the soil surface; and</li> <li>Erosion (e.g. gully formation and bank collapse).</li> </ul>				
Introduction and spread of alien vegetation.	The movement of soil and vegetation results in opportunistic invasions after disturbance, as well as through the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a wetland, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system, alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented, alien plants can easily colonise and impact on downstream users.	To prevent the introduction and spread of alien vegetation.		<ul style="list-style-type: none"> <li>Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Changes in water quality due to foreign materials and increased nutrients impact ratings.	Operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/streams and a reduction in wetland function. This could also possibly impact on groundwater.	To prevent changes in water quality due to foreign materials and increased nutrients impact ratings.		<ul style="list-style-type: none"> <li>Same mitigation measures as under construction phase.</li> <li>Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects.</li> <li>Control of waste discharges. Do not allow dirty water from operational activities to enter the watercourse.</li> <li>Regular independent water quality monitoring should form part of operational procedures in order to identify pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Construction of the wastewater treatment plant.	Maintenance of an artificial wetland ecosystem, linked to the proposed wastewater treatment plant. Provision of a habitat for fauna species.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
<b>Post-construction and Rehabilitation Phase</b>					
Post-construction and rehabilitation activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Cumulative Impacts</b>					
Should mitigation measure not be implemented and changes made to the bed or banks of the watercourse, unstable channel conditions may result.	Erosion, meandering, increased potential for flooding and movement of bed material that may result in property damage adjacent to and downstream of the site. Reversing this process is unlikely and should be prevented in the first place.	To prevent erosion, meandering and an increase in the potential for flooding and the movement of bed material.		<ul style="list-style-type: none"> <li>Implement the mitigation measures as provided under the construction and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>

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Should mitigation measures for the management of alien invasive species not be implemented, or not be implemented correctly.	Construction areas within the watercourses along the proposed servitude can experience an increased alien invasion.	To prevent the establishment and spread of alien invasive vegetation.		<ul style="list-style-type: none"> <li>Implement the mitigation measures as provided under the construction and operational phases.</li> <li>Regular monitoring should be implemented during construction and rehabilitation, as well as for a period after rehabilitation is completed.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
The introduction of toxins into the environmental system.	Once in the system it may take many years for some toxins to be eradicated.	To prevent the release of toxins into the environment.		<ul style="list-style-type: none"> <li>Implement the mitigation measures as provided under the construction and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Surface and Groundwater</b>					
<b>Construction Phase</b>					
Construction activities.	<p>Pollution of surface and/or groundwater resources due to the release of pollutants, such as chemicals.</p> <p>Pollution of surface and/or groundwater resources due to the incorrect management of chemical substances and dangerous goods.</p>	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.		<ul style="list-style-type: none"> <li>No wastewater or wash water may be released into the environment from construction activities.</li> <li>Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Construction activities.	Pollution of surface and/or groundwater resources due to poor waste management.	To ensure that waste (construction waste, general waste and hazardous waste) is managed in an environmentally responsible manner.		<ul style="list-style-type: none"> <li>Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>No waste may be stored within wetlands and/or watercourses.</li> <li>Sufficient ablution facilities must be provided.</li> <li>Chemical toilets must be serviced regularly and must be provided with toilet paper at all times.</li> <li>Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste.</li> <li>Construction waste must be stored in a designated area.</li> <li>Building rubble must be stored separately from domestic waste and may be stored on bare soil as it is inert in nature. It must, however, be ensured that other waste (general and/or hazardous waste) is not mixed together with the building rubble.</li> <li>Refuse bins must be provided for domestic waste.</li> <li>Large volumes of waste may not accumulate onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>

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Runoff of contaminated stormwater.	Pollution of surface and/or groundwater resources.	To prevent the contamination of storm water.		<ul style="list-style-type: none"> <li>No waste may be burnt or buried onsite.</li> <li>Building rubble must be kept clean of plastic and brick ties.</li> <li>Storm water must be diverted around areas where there are pollution sources.</li> <li>Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>No contaminated storm water may be released into the environment from the construction activities.</li> <li>Washing or cleaning of equipment and machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a leak-proof container or a plastic lined pit.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
The mixing of concrete.	Pollution of surface and/or groundwater resources.	To prevent the contamination of water during to concrete mixing.		<ul style="list-style-type: none"> <li>Concrete should ideally be mixed on an impermeable surface such as a concrete slab.</li> <li>Cement bags (new and used) must be stored under roof or in closed containers where they will not be exposed to rain.</li> <li>Dry concrete must be removed and disposed of together with other building rubble.</li> <li>Ready-mix concrete trucks may clean chutes into foundations, but not elsewhere onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
The usage of water (ground water).	Wastage of water resources due to the irresponsible use of water.	To ensure that valuable resources are not wasted.		<ul style="list-style-type: none"> <li>Water pipes and hoses should be inspected on a regular basis and any leakages should immediately be repaired.</li> <li>Running water taps or hoses may not be left unattended.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>					
Operational activities.	<p>Pollution of surface and/or groundwater resources due to the release of pollutants, such as chemicals.</p> <p>Pollution of surface and/or groundwater resources due to the incorrect management of chemical substances and dangerous goods.</p>	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.		<ul style="list-style-type: none"> <li>Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Operational activities.	Pollution of surface and/or groundwater resources due to the potential release of wastewater (sewage and wash water) during the operational phase.	To prevent the release of wastewater into the environment.		<ul style="list-style-type: none"> <li>All wastewater (sewage and wash water) must be collected in appropriate holding/conservancy tanks and may not come into contact with the environment prior to treatment in the proposed wastewater treatment plant.</li> <li>The wash water from the cleaning of the houses must be collected and trucked to the wastewater treatment plant for treatment.</li> <li>All wastewater must be treated in the proposed Wastewater Treatment Plant.</li> <li>The Wastewater Treatment Plant must treat the wastewater to a quality that at least complies with the Department of Water and Sanitation' General Limit Standards for discharge of wastewater into a water resource.</li> <li>Sufficient ablution facilities must be provided.</li> <li>The integrity of the holding/conservancy tanks must be checked at a frequency as determined by the tank suppliers.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Operational activities.	Pollution of surface and/or groundwater resources due to poor waste management.	To ensure that waste (general waste and hazardous waste) is managed in an environmentally responsible manner.		<ul style="list-style-type: none"> <li>Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>No waste may be stored within wetlands and/or watercourses.</li> <li>Sufficient ablution facilities must be provided.</li> <li>Refuse bins must be provided for domestic waste.</li> <li>Large volumes of waste may not accumulate onsite.</li> <li>No waste may be burnt or buried onsite.</li> <li>Ash must be stored on a concrete area, under a roof, or in suitable, closed container prior to removal.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>



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				<ul style="list-style-type: none"> <li>The ash must be managed according to best practice requirements and its waste classification. The ash has been classified and is a Type 3 waste.</li> <li>Should ash be disposed of off-site, a safe disposal certificate must be obtained and kept on record.</li> </ul> <p><b>Litter/manure</b></p> <ul style="list-style-type: none"> <li>Litter/manure should be removed from the farm as soon as possible after it has been removed from the chicken houses (during cleaning at the end of each production cycle).</li> <li>No litter/manure may be disposed of onsite.</li> <li>If the litter/manure cannot be removed offsite immediately, it must be kept in a dry area, covered by sheeting or within a shed to protect it from rain and leaching.</li> </ul> <p><b>Mortalities</b></p> <ul style="list-style-type: none"> <li>The temporary storage area for mortalities must be an enclosed area or room with access control to prevent the unlawful removal of mortalities. Mortality rooms (enclosed and roofed buildings) are acceptable.</li> <li>Mortalities must be removed offsite as soon as possible to accredited facilities.</li> </ul> <p><b>Mass mortalities</b> In the event of a disease outbreak:</p> <ul style="list-style-type: none"> <li>Notify the state veterinarian.</li> <li>The state veterinarian must visit the site.</li> <li>The state vet will place the property, or the specific chicken site or house that is infected, under quarantine.</li> <li>Depending on the disease and severity, the state veterinarian will specify how the infected chickens should be treated and disposed of. This should also be conducted in accordance with requirements from the National Department of Environmental Affairs.</li> </ul>	
Operational activities.	Unsustainable utilisation of groundwater.	To ensure that valuable resources are not wasted.		<ul style="list-style-type: none"> <li>Determine the sustainable yield of each borehole that is to be used for the development.</li> <li>Only abstract groundwater at the sustainable yield rate, as determined from the borehole yield pump tests.</li> <li>Install water meters to measure the quantity of water abstracted on a daily basis from each borehole.</li> <li>Regularly inspect reservoirs, water pipes, JoJo tanks and taps for leakages and repair where necessary.</li> <li>All hose pipes must be fitted with the correct nozzle attachments and high-pressure hoses must be used where possible.</li> <li>Running water taps or hoses may not be left unattended.</li> <li>High pressure hoses should be used, where possible.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Runoff of contaminated stormwater.	Pollution of surface and/or groundwater resources.	To prevent the contamination of storm water.		<ul style="list-style-type: none"> <li>Storm water must be diverted around areas where there are pollution sources.</li> <li>Storm water drainage infrastructure must be regularly inspected for obstructions.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Post-construction and Rehabilitation Phase</b>					
Post-construction and rehabilitation activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Cumulative Impacts</b>					
None anticipated.	None anticipated.	Not Applicable.			Not Applicable.
<b>Fauna</b>					
<b>Construction Phase</b>					
Direct impact on mammal and herpetofaunal communities.	The construction of the chicken farms will each displace natural habitat over a small area, but relative to the extent of the property this <b>will be insignificant.</b>	To minimise direct impacts on mammal and herpetofaunal communities.		Mitigating of the impacts is impossible.	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Loss of mammal and	The construction of the chicken farms	To prevent the loss of		Mitigating of the impacts is impossible considering the prerequisite design and application of a chicken farm.	<ul style="list-style-type: none"> <li>Applicant</li> </ul>

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
herpetofaunal habitat and ecological structure.	will entirely displace natural habitats.	mammal and herpetofaunal habitat and ecological structure.			<ul style="list-style-type: none"> <li>Construction contractor</li> </ul>
Loss of avian habitats.	Depending on the size of the chicken facilities, an area in the region of 100ha of avian habitats comprising mainly "randjiesveld" woodland will be destroyed by the proposed development. The construction of road network will result in additional losses. This will represent a moderate loss of habitat and is unlikely to significantly negatively impact bird communities at the site or in the region.	To prevent the loss of avian habitats.		<ul style="list-style-type: none"> <li>Areas cleared for the chicken facilities, roads and other infrastructure must be minimised during both the construction and operational phases.</li> <li>The facility at site 13, where the artificial dam is located, should be positioned so as avoid destroying the dam. During the site visit, it was indicated that the intention is to build the facility at the site of existing dam, and that the dam would be relocated. However, this approach does not take into account the well-developed vegetation surrounding the existing dam, which represents important avian habitat. Moving the facility so as to avoid destroying the dam is the recommended solution.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Increased disturbance of birds by human activities.	In addition to direct habitat loss, the disturbance of birds in the surrounding areas will increase because of increased human activity and movements in the area. This impact will be more pronounced during the construction phase than the operational phase.	To minimise and prevent the disturbance of birds through human activities.		<ul style="list-style-type: none"> <li>Construction activities must be limited to the sites of the chicken facilities and personnel should not be allowed to disturb birds in the surrounding areas.</li> <li>Measures must be put in place to ensure that no illegal hunting of birds takes place on the property or in surrounding areas.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Mortality associated with new roads linking the chicken facilities.	Vehicles using the roads will result in an increased mortality risk for birds, mammals, reptiles and amphibians through collisions with moving vehicles.	To prevent birds and other fauna being driven into or over on access roads.		<ul style="list-style-type: none"> <li>Strict enforcement of a 40 km/h speed limit.</li> <li>Minimise unnecessary driving and in particular limit driving at night.</li> <li>Ensure that all personnel driving on the property are aware of the risk of road kills.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Environmental contamination, including disease transmission from chickens to wild birds.	The new chicken facilities will create a risk of contamination of natural habitats in the surrounding areas if spillages of substances such as chicken manure should occur. A related risk concerns the possibility of contact between chickens and wild birds and the possibility of disease transmission subsequently occurring.	To prevent environmental contamination and disease transmission.		<ul style="list-style-type: none"> <li>Standard biosecurity procedures must be implemented in order to ensure that no contact between chickens and wild birds, mammals or any other groups takes place.</li> <li>Access to and from the breeder farm should only be by prior arrangement.</li> <li>The RCL Poultry Health and Biosecurity Plan for Rearing and Breeder Operations, Roodewal, October 2007, must be followed. This includes Sanitation requirements, a Vaccination Program and a Disease Control Program.</li> <li>There should be a requirement for staff and visitors to shower onsite before gaining access to chicken houses.</li> <li>Footbaths with disinfectant should be installed.</li> <li>Installation of rodent bait traps and flytraps.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Power lines: collision and electrocution risk to birds.	It is assumed that new distribution lines will need to be constructed to provide power to the chicken facilities. These will create electrocution and collisions risks for birds, although these will be minor compared to those associated with large transmission lines.	To prevent the collision of birds with power lines.		<ul style="list-style-type: none"> <li>Assuming that the usual small transmission lines are used, no specific mitigation measures are required. If any collisions are recorded subsequently, the installation of devices to increase the visibility of lines to birds can be considered. But the risk posed by low distribution lines is very minor compared to larger transmission lines.</li> <li>Information regarding the design of these lines should be made available to the ornithologist before construction commences, in order to confirm the assumptions made here about their height and likely impacts.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>					
Direct impact on	The construction of the chicken farms	To minimise direct impacts		<ul style="list-style-type: none"> <li>Same as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>

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mammal and herpetofaunal communities.	will each displace natural habitat over a small area, but relative to the extent of the property this <b>will be insignificant.</b>	on mammal and herpetofaunal communities.			
Loss of mammal and herpetofaunal habitat and ecological structure.	The construction of the chicken farms will entirely displace natural habitats.	To prevent the loss of mammal and herpetofaunal habitat and ecological structure.		<ul style="list-style-type: none"> <li>• Same as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Loss of avian habitats.	Depending on the size of the chicken facilities, an area in the region of 100ha of avian habitats comprising mainly "randjiesveld" woodland will be destroyed by the proposed development. The construction of road network will result in additional losses. This will represent a moderate loss of habitat and is unlikely to significantly negatively impact bird communities at the site or in the region.	To prevent the loss of avian habitats.		<ul style="list-style-type: none"> <li>• Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Increased disturbance of birds by human activities.	In addition to direct habitat loss, the disturbance of birds in the surrounding areas will increase because of increased human activity and movements in the area. This impact will be more pronounced during the construction phase than the operational phase.	To minimise and prevent the disturbance of birds through human activities.		<ul style="list-style-type: none"> <li>• Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Mortality associated with new roads linking the chicken facilities.	Vehicles using the roads will result in an increased mortality risk for birds, mammals, reptiles and amphibians through collisions with moving vehicles.	To prevent birds and other fauna being driven into or over on access roads.		<ul style="list-style-type: none"> <li>• Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Environmental contamination, including disease transmission from chickens to wild birds.	The new chicken facilities will create a risk of contamination of natural habitats in the surrounding areas if spillages of substances such as chicken manure occur. A related risk concerns the possibility of contact between chickens and wild birds and the possibility of disease transmission subsequently occurring.	To prevent environmental contamination and disease transmission.		<ul style="list-style-type: none"> <li>• Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Power lines: collision and electrocution risk to birds.	It is assumed that new distribution lines will need to be constructed to provide power to the chicken facilities. These will create electrocution and collisions risks for birds, although	To prevent the collision of birds with power lines.		<ul style="list-style-type: none"> <li>• Same mitigation measures as under construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
	these will be minor compared to those associated with large transmission lines.				
<b>Post-construction and Rehabilitation Phase</b>					
Post-construction and rehabilitation activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Cumulative Impacts</b>					
Development associated with the proposed project.	The proposed development will result in additional avifaunal habitat loss in the region. However, the small area involved means that this impact is minor.	To prevent the loss of avian habitats.		<ul style="list-style-type: none"> <li>Implement the mitigation measures as provided under the construction and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Development associated with the proposed project.	Increased disturbance at a local scale, but unlikely to be significant.	To minimise and prevent the disturbance of birds through human activities.		<ul style="list-style-type: none"> <li>Implement the mitigation measures as provided under the construction and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Construction and operational activities.	Increased road kill mortality at a local scale, but unlikely to be significant.	To prevent birds and other fauna being driven into or over on access roads.		<ul style="list-style-type: none"> <li>Implement the mitigation measures as provided under the construction and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Operation of the breeder farm.	Poultry farms, by their nature, elevate the risk of disease transmission between wild and domestic species. However, as long as adequate biosecurity measures are put in place, the cumulative impact should not be cause for concern.	To prevent disease transmission.		<ul style="list-style-type: none"> <li>Implement the mitigation measures as provided under the construction and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Flora Construction Phase</b>					
Removal of natural, good condition vegetation.	<ul style="list-style-type: none"> <li>Destruction of vegetation;</li> <li>Potential loss of individuals of large tree species and associated microhabitats;</li> <li>Potential loss of species of conservation concern and their habitats;</li> <li>Potential increase in runoff and erosion;</li> <li>Potential spread of alien invasive vegetation; and</li> <li>Potential contamination of soils with hydrocarbons and/or other pollutants.</li> </ul>	To minimise the extent of vegetation removal and the impact of removal that cannot be prevented.		<ul style="list-style-type: none"> <li>An independent Ecological Control Officer (ECO) should be appointed to oversee construction.</li> <li>Planning of the construction site must incorporate eventual rehabilitation of areas destroyed by construction and areas that do not contain infrastructure.</li> <li>Plan site layout and construction plan to leave as much of the natural vegetation intact as possible, while limiting the removal of tree species. Leaving groundcover and surrounding trees intact could help with dust suppression, as well as erosion control.</li> <li>A perimeter fence must be erected around the works area to prevent access to sensitive environs.</li> <li>Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. Ideally, the construction areas should be fenced off.</li> <li>Maintain site demarcations in position until the cessation of construction work.</li> <li>Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution.</li> <li>Ensure there is a method statement in place to immediately remedy any accidental spillages.</li> </ul> <p><b>General</b></p> <ul style="list-style-type: none"> <li>A rehabilitation plan, using indigenous species from the study area, must be implemented that will restore disturbed areas beyond the footprint of the infrastructure to what it was prior to construction, thereby making the impact on the remainder of the site negligible in the long term. Due to the dry climate, natural colonisation could take a long time, in which vegetation may degrade further or become dominated by encroacher species. Therefore, timeous rehabilitation is imperative. Even in the event of good rains, annual pioneer plants are short-lived and therefore an effort must be made to keep as many shrubs in place as possible or to replace these as part of rehabilitation. As a start, runoff water needs to be trapped by either the mechanical breaking of the soil</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> <li>ECO</li> </ul>

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
				<p>surface to trap water, packing of stones, tyres or brush along contours to trap mulch, slow down water movement and reduce the impact on bare soil (Esler, <i>et al.</i>, 2006). Pitter basins work well on fine textured soil and must be orientated and shaped to face upslope. The basins trap seeds, organic matter and water that could lead to rapid colonisation after rains (Esler, <i>et al.</i>, 2006).</p> <ul style="list-style-type: none"> <li>• No open fires are permitted under trees or within naturally vegetated areas.</li> <li>• No vegetative matter may be removed for firewood or any other purpose other than the approved activity.</li> <li>• Do not remove any large tree without the permission of the ECO. In all areas, mark trees earmarked for removal prior to felling for approval by the ECO. No protected trees or plants may be removed without the relevant permits from the local authority.</li> <li>• Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.</li> <li>• Workers may not tamper or remove flora and neither may anyone collect seed from the plants without permission from the local authority.</li> <li>• Do not permit vehicular or pedestrian access into natural areas.</li> <li>• Removed herbaceous plants could be housed in a temporary nursery and used to rehabilitate the areas affected during construction. The nursery and rehabilitation should form part of the rehabilitation plan.</li> <li>• The planned conservation of the remainder of the farm must be formalised and written into the record of decision for this proposed development. The protection of this area should be enhanced by implementing amongst others a Vegetation and Grazing Management Plan, based on the carrying capacity of the land, as well as an Alien Invasive Species Management Plan.</li> </ul>	
Erosion, compaction and subsequent sedimentation.	soil and	<ul style="list-style-type: none"> <li>• Soil compaction;</li> <li>• Potential increase in runoff and erosion;</li> <li>• Possible change of natural runoff and drainage patterns;</li> <li>• Possible permanent loss of re-vegetation potential of soil surface;</li> <li>• Potential spread of alien invasive vegetation; and</li> <li>• Negative impact on indigenous species' growing conditions.</li> </ul>	To minimise erosion, soil compaction and sedimentation.	<ul style="list-style-type: none"> <li>• No storm water from the construction site (or operational site) is allowed to be channelled directly into a non-perennial drainage line or the pan. Any water released from the site should conform to specification as per a licence granted by the DWA.</li> <li>• Do not allow erosion to develop on a large scale before taking action.</li> <li>• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area (DWA, 2005).</li> <li>• Runoff from roads must be managed to avoid erosion and pollution problems.</li> <li>• Remove only the vegetation where essential for operation and do not allow any disturbance of the adjoining natural vegetation cover.</li> <li>• Where topsoil needs to be removed, store such in a separate area where the soil can be protected until it can be re-used for post-construction rehabilitation. Never mix topsoil with subsoil or other spoil materials.</li> <li>• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.</li> <li>• Make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.</li> <li>• Runoff water needs to be trapped by either the mechanical breaking of the soil surface to trap water, packing of stones, tyres or brush along contours to trap mulch, slow down water movement and reduce the impact on bare soil (Esler <i>et al.</i>, 2006). Pitter basins work well on fine textured soil and must be orientated and shaped to face upslope. The basins trap seeds, organic matter and water that could lead to rapid colonisation after rains (Esler, <i>et al.</i>, 2006).</li> <li>• Mulch and brush also reduces the force of raindrops, limiting the dispersion of clay and the extent of mineral crusting (Esler <i>et al.</i>, 2006). It also traps dust, sand and seeds to ensure plant establishment (Esler <i>et al.</i>, 2006).</li> <li>• Vehicles may not veer from the dedicated roads.</li> <li>• Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Removal of protected species or species of conservation concern.		<ul style="list-style-type: none"> <li>• Potential loss of individuals or populations of conservation concern; and</li> <li>• Changes in species composition.</li> </ul>	To protect protected species and/or species of conservation concern.	<ul style="list-style-type: none"> <li>• Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Invasion by alien invasive plant species.	Increase in alien invasive plant species and densities on the site.	To prevent the invasion by alien invasive plant species.		<ul style="list-style-type: none"> <li>• All alien seedlings and saplings must be removed as they become evident for the duration of construction.</li> <li>• Manual/mechanical removal is preferred to chemical control.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction</li> </ul>

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				<ul style="list-style-type: none"> <li>All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.</li> <li>Dispose of the eradicated plant material at an approved solid waste disposal site.</li> </ul>	contractor
Bush densification.	<ul style="list-style-type: none"> <li>Increase in bush encroacher species; and</li> <li>Change in vegetation structure.</li> </ul>	To prevent bush densification.		<ul style="list-style-type: none"> <li>Leave as much natural vegetation intact as possible.</li> <li>Do not disturb soil unnecessarily.</li> <li>Monitor rehabilitation and do not allow grazing to take place until such time that re-vegetation was found to be successful.</li> <li>Ensure that areas outside of the operational footprint that was disturbed are adequately rehabilitated and that dense stands of encroacher species are prevented.</li> <li>Develop a burning, cutting and/or grazing management plan with an ecologist which takes into account safety of the operation, local by-laws and national legislation, in order to effectively manage veld areas.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Deterioration of watercourses and riparian vegetation.	<ul style="list-style-type: none"> <li>Destruction of vegetation;</li> <li>Deterioration of vegetation and watercourse; and</li> <li>Potential contamination of soils with hydrocarbons and/or other pollutants.</li> </ul>	To prevent the deterioration of watercourses and riparian vegetation onsite.		<ul style="list-style-type: none"> <li>Where access through drainage lines and non-perennial rivers is unavoidable, only one road is permitted, constructed perpendicular to the drainage line. Avoid roads that follow drainage lines within the floodplain. Access roads through the watercourses should be formalised and any road construction within watercourses could only be undertaken if authorised by a Water Use License or permission from Department of Water and Sanitation (DWS).</li> <li>No contaminated storm water from the construction site (or operational site) is allowed to be channelled directly into a non-perennial or perennial river. Any water released from the site should conform to specification as per a licence granted by the DWS.</li> <li>An ecologically sound, Storm Water Management Plan must be implemented, including all measures as set out above.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>					
Erosion, soil compaction and subsequent sedimentation.	<ul style="list-style-type: none"> <li>Soil compaction;</li> <li>Potential increase in runoff and erosion;</li> <li>Possible change of natural runoff and drainage patterns;</li> <li>Possible permanent loss of re-vegetation potential of soil surface;</li> <li>Potential spread of alien invasive vegetation; and</li> <li>Negative impact on indigenous species' growing conditions.</li> </ul>	To prevent soil compaction, sedimentation, soil erosion, an increase in runoff, changes to natural drainage patterns, permanent loss of re-vegetation potential of the soil surface, the spread of alien invasive vegetation and negative impacts on indigenous species' growing conditions.		<ul style="list-style-type: none"> <li>After construction, clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoil and landscape to surrounding level.</li> <li>Disturbed areas must be re-vegetated as soon as possible.</li> <li>Ideally, grass sods should be removed prior to construction and these sods be re-used for re-vegetation. Smaller plant species that were removed from the development footprint should also be re-planted where possible. The areas could be left to re-vegetate naturally, provided that the establishment of indigenous vegetation similar to that which was removed is monitored. Monitoring must prevent invasion by alien invasive or bush densification species and ensure indigenous vegetation cover within 2-3 years.</li> <li>Bare soil must be protected from erosion and compaction until such time as an indigenous vegetation cover is re-established.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Invasion by alien invasive plant species.	Increase in alien invasive plant species and densities on the site.	To prevent the establishment and spread of alien invasive plant species.		<ul style="list-style-type: none"> <li>Dispose of the eradicated plant material at an approved solid waste disposal site.</li> <li>Compile and implement an Alien Invasive Monitoring Plan to remove alien invasive plant species as they become apparent.</li> <li>Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.</li> <li>Ensure that only properly trained people handle and make use of chemicals.</li> <li>Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species.</li> <li>In addition, only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Bush densification.	<ul style="list-style-type: none"> <li>Increase in bush encroacher species; and</li> <li>Change in vegetation structure.</li> </ul>	To prevent bush densification.		<ul style="list-style-type: none"> <li>Monitor the establishment of dense stands of encroacher species and remove them as soon as detected.</li> <li>A rehabilitation plan, using indigenous species from the study area, must be implemented to restore disturbed areas beyond the footprint of the infrastructure to what it was prior to construction, thereby making the impact on the remainder of the site negligible in the long term.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Deterioration of watercourses and riparian vegetation.	<ul style="list-style-type: none"> <li>Destruction of vegetation;</li> <li>Deterioration of vegetation and watercourse; and</li> </ul>	To prevent the deterioration of watercourses and riparian vegetation onsite.		<ul style="list-style-type: none"> <li>No contaminated storm water from the operational site is allowed to be channelled directly into a non-perennial or perennial river. Any water released from the site should conform to specification as per a licence granted by the DWA.</li> <li>An ecologically sound, Storm Water Management Plan must be implemented, including all measures as set out above.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>

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	<ul style="list-style-type: none"> <li>Potential contamination of soils with hydrocarbons and/or other pollutants.</li> </ul>				
<b>Post-construction and Rehabilitation Phase</b>					
Post-construction and rehabilitation activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Cumulative Impacts</b>					
Construction and operational activities.	<p>Removal of natural, good condition vegetation:</p> <ul style="list-style-type: none"> <li>Possible erosion of surrounding areas if no mitigation is implemented;</li> <li>Possible increased fragmentation of remaining natural vegetation;</li> <li>Possible bush densification or invasion by alien invasive plant species; and</li> <li>Possible expansion of the chicken farm with additional infrastructure and chicken houses that will increase fragmentation and impact on the vegetation composition and structure (Note: no further expansion is planned by the applicant).</li> </ul>	To minimise the removal of natural, good condition vegetation and to prevent impacts from the removal of natural, good condition vegetation, where such removal cannot be avoided.		Implement the mitigation measures as provided under the construction and operational phases.	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Construction and operational activities.	<p>Erosion, soil compaction and subsequent sedimentation:</p> <ul style="list-style-type: none"> <li>Sedimentation;</li> <li>Possible bush densification or invasion by alien invasive plant species;</li> <li>Further fragmentation of natural habitats;</li> <li>Altered topsoil conditions; and</li> <li>Potentially barren areas remaining after construction.</li> </ul>	To prevent erosion, soil compaction and sedimentation.		Implement the mitigation measures as provided under the construction and operational phases.	<ul style="list-style-type: none"> <li>Applicant</li> <li>Applicant</li> </ul>
Site clearance.	<p>Removal of protected species or species of conservation concern:</p> <ul style="list-style-type: none"> <li>Loss of diversity;</li> <li>Decline in provincial or national numbers of species of conservation concern; and</li> <li>Future expansion of the chicken farm will lead to a further</li> </ul>	To minimise the impacts of site clearance on vegetation communities.		Implement the mitigation measures as provided under the construction and operational phases.	<ul style="list-style-type: none"> <li>Applicant</li> </ul>

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	reduction in these species and fragmentation and should therefore be prohibited (Note: no further expansion is planned by the applicant).				
Construction and operational activities.	Invasion by alien invasive plant species: <ul style="list-style-type: none"> <li>Increase in alien invasive plant species in the area that the site is situated in; and</li> <li>Loss of indigenous species diversity.</li> </ul>	To prevent the establishment and spread of alien invasive plant species and the loss of indigenous species diversity.		Implement the mitigation measures as provided under the construction and operational phases.	• Applicant
Construction and operational activities.	Bush densification: <ul style="list-style-type: none"> <li>Possible bush densification on the site and loss of indigenous species diversity.</li> </ul>	To prevent bush densification.		Implement the mitigation measures as provided under the construction and operational phases.	• Applicant
Construction and operational activities.	Deterioration of watercourses and riparian vegetation: <ul style="list-style-type: none"> <li>Possible loss of the ecological function of riparian vegetation and erosion of riverbanks;</li> <li>Decrease in water quality; and</li> <li>Flooding downstream.</li> </ul>	To prevent the deterioration of watercourses and riparian vegetation onsite.		Implement the mitigation measures as provided under the construction and operational phases.	• Applicant
<b>Heritage Resources</b>					
<b>Construction Phase</b>					
Construction activities.	Disturbance or destruction of cultural and heritage resources – Site 13 (possible Stone Age knapping area and open air surface site) and Site 24 (LIA stone-walled settlement site).	To prevent the disturbance or destruction of cultural and heritage resources.		The subterranean presence of archaeological or historical sites, features or objects should always be kept in mind. Should any new sites be uncovered during the development process, an archaeologist should be called in to investigate and recommend on the best way forward. The presence of other low stone packed- or unmarked graves should also be kept in mind.  For Sites 13 and 24 the following measures need to be implemented: <ul style="list-style-type: none"> <li>A permit application in terms of section 35 of the National Heritage Resources Act, Act No. 25 of 1999 (NHRA) and Chapter IV of the NHRA Regulations (No. R548 of 2000) must be applied for in order to mitigate sites 13 and 24.</li> <li>Archaeological mitigation measures need to be implemented as follows: The in detail mapping of Sites 13 and 24, the collection of representative samples of material (for Stone Age Site 13) as well as Archaeological Excavation work on Site 24. Once this work has been completed and the go-ahead has been obtained from SAHRA, these sites can be demolished.</li> <li>A Heritage Management Plan (HMP) must be developed for <i>in situ</i> conservation and management of heritage resources located within the development footprint. The HMP must be submitted to SAHRA for approval.</li> </ul>	• Applicant • Construction contractor
Construction activities.	Disturbance or destruction of cultural and heritage resources – Sites 17, 19, 20 and 23 – the sites will not be directly impacted upon.	To prevent the disturbance or destruction of cultural and heritage resources.		• A no-go buffer zone of 30m must be put in place around Sites 17, 19, 20 and 23.	• Applicant • Construction contractor
Construction activities.	Disturbance or destruction of cultural and heritage resources – Sites 18 and 21 (pottery scatters) – the sites are of no significance.	To prevent the disturbance or destruction of cultural and heritage resources.		No mitigation measures are required as Sites 18 and 21 are of no significance.	• Applicant • Construction contractor
<b>Operational Phase</b>					



Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
Operational activities.	Disturbance or destruction of cultural and heritage resources – Site 13 (possible Stone Age knapping area and open air surface site) and Site 24 (LIA stone-walled settlement site) – Phase 2 archaeological mitigation measures need to be implemented and a Destruction Permit obtained from SAHRA before these sites can be destroyed.	To prevent the disturbance or destruction of cultural and heritage resources.		<ul style="list-style-type: none"> <li>The subterranean presence of archaeological or historical sites, features or objects should always be kept in mind. Should any new sites be uncovered during the development process, an archaeologist should be called in to investigate and recommend on the best way forward. The presence of other low stone packed- or unmarked graves should also be kept in mind.</li> <li>The approved Heritage Management Plan (HMP) must be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Operational activities.	Disturbance or destruction of cultural and heritage resources – Sites 17, 19, 20 and 23 – the sites will not be directly impacted upon.	To prevent the disturbance or destruction of cultural and heritage resources.		<ul style="list-style-type: none"> <li>A no-go buffer zone of 30m must be maintained and enforced around Sites 17, 19, 20 and 23.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
Operational activities.	Disturbance or destruction of cultural and heritage resources – Sites 18 and 21 (pottery scatters) – the sites are of no significance.	To prevent the disturbance or destruction of cultural and heritage resources.		No mitigation measures are required as Sites 18 and 21 are of no significance.	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Post-construction and Rehabilitation Phase</b>					
Rehabilitation activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Cumulative Impacts</b>					
Construction and operational activities.	Disturbance or destruction of cultural and heritage resources onsite resulting in a decline in the overall cultural and heritage value of the greater area.	To prevent the disturbance or destruction of cultural and heritage resources.		Mitigation measures detailed for the construction phase must be implemented.	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Palaeontological Resources</b>					
<b>Construction Phase</b>					
Construction activities, if deep excavation is envisaged.	High possibility that significant micro-organism fossil remains may be present in the Silverton Formation parts of the site. The alluvium areas may also contain significant fossils not yet recorded for the area. Stromatolitic structures may be uncovered if bedrock is exposed during foundation excavations.	To prevent the unregulated/uncontrolled destruction of fossil assemblages.		<ul style="list-style-type: none"> <li>The EAP as well as the ECO for this project must be made aware of the fact that the Silverton Formation sediments are Highly significant for fossil remains of micro-organisms and the alluvium might contain significant fossils not yet recorded for this area.</li> <li>If bedrock is exposed during excavation for foundations, the ECO must report exposure of possible stromatolitic structures. The likelihood of these structures being present is, however, small.</li> <li>A suitably qualified palaeontologist must be appointed to do a Phase 1 PIA investigation at the onset of excavations and to also update the basic recommendations made in the “Chance Find Protocol”.</li> <li>The Chance Finds Protocols must be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>					
Operational activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Post-construction and Rehabilitation Phase</b>					
Rehabilitation activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Cumulative Impacts</b>					
Construction and operational activities.	None anticipated.	Not Applicable.			Not Applicable.

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
<b>Air Quality and Noise</b>					
<b>Construction Phase</b>					
Construction activities.	Generation of dust.	To prevent the generation of dust.		<ul style="list-style-type: none"> <li>Implement dust suppression techniques.</li> <li>Limit vegetation clearance until it is necessary for soil stripping.</li> <li>A complaints register must be kept onsite and be easily accessible to any party who wishes to lodge a complaint. The complaints register must include the following fields: <ul style="list-style-type: none"> <li>The date of the complaint;</li> <li>The name and surname of the person lodging the complaint;</li> <li>Details of the complaint; and</li> <li>How and when the complaint was addressed.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Construction activities.	Release of emissions from construction vehicles.	To minimise emissions from construction vehicles.		<ul style="list-style-type: none"> <li>Regular maintenance of vehicles to minimise the release of emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Construction activities.	Generation of nuisance and noise from construction vehicles and equipment/machinery.	To prevent the generation of excessive noise.		<ul style="list-style-type: none"> <li>Noisy activities must be scheduled during times of the day that will result in the least disturbance to adjacent sensitive receptors.</li> <li>Noisy work must be avoided on weekends and public holidays.</li> <li>No amplified music is allowed onsite.</li> <li>Sirens and/or hooters may only be used during emergencies and drills.</li> <li>Vehicles must not be left idling unnecessarily.</li> <li>All vehicles must be regularly maintained.</li> <li>A complaints register must be kept onsite and be easily accessible to any party who wishes to lodge a complaint. The complaints register must include the following fields: <ul style="list-style-type: none"> <li>The date of the complaint;</li> <li>The name and surname of the person lodging the complaint;</li> <li>Details of the complaint; and</li> <li>How and when the complaint was addressed.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>					
Operational activities.	Generation of emissions, such as carbon dioxide, carbon monoxide, sulphur dioxide and nitrous oxides, from coal hot water boilers.	To minimise emissions from coal hot water boilers.		<ul style="list-style-type: none"> <li>Use high-grade coal as far as possible to decrease sulphur emissions.</li> <li>Hot water boilers must be maintained according to the supplier's maintenance schedules to minimise emissions.</li> <li>Mitigation measures should be implemented on the hot water boilers to minimise particulate matter (PM) emissions.</li> <li>Ash should be stored in enclosed containers/areas.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Post-construction and Rehabilitation Phase</b>					
Rehabilitation activities.	Generation of nuisance and noise from construction vehicles and equipment/machinery.	To prevent the generation of excessive noise.		Same mitigation measures as under construction phase.	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Cumulative Impacts</b>					
Construction and operational activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Soil</b>					
<b>Construction Phase</b>					
Site clearance during the construction phase.	Soil erosion due to the clearance of vegetation.  Degradation of topsoil due to incorrect storage practices.	To prevent erosion during site clearance.  To conserve/ protect topsoil.		<ul style="list-style-type: none"> <li>Limiting vegetation clearance until it is necessary for soil stripping.</li> <li>Implement adequate erosion prevention measures, such as measures to dissipate runoff water velocities.</li> <li>Implement adequate storm water management measures.</li> <li>Topsoil and subsoil must be stored on separate stockpiles.</li> <li>Cover topsoil stockpiles to prevent the soil being washed away during rainfall events.</li> <li>Topsoil must be replaced during rehabilitation and landscaping.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
Construction activities.	Soil compaction to create foundations for buildings and other associated infrastructure.	To prevent soil compaction.		<ul style="list-style-type: none"> <li>The development footprint must be optimised to minimise the area that will be compacted during the construction activities.</li> <li>Soil should be moved when dry, as far as possible.</li> <li>Excessively heavy vehicles should not be used for earthmoving activities. This will minimise compaction of the soil.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Construction activities.	Soil pollution due to the incorrect management of chemical substances and dangerous goods.	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.		<ul style="list-style-type: none"> <li>No wastewater or wash water may be released into the environment from construction activities.</li> <li>Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Construction activities.	Soil pollution due to poor waste management (general and hazardous waste).	To ensure that waste (construction waste, general waste and hazardous waste) is managed in an environmentally responsible manner.		<ul style="list-style-type: none"> <li>Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>No waste may be stored within wetlands and/or watercourses.</li> <li>Sufficient ablution facilities must be provided.</li> <li>Chemical toilets must be serviced regularly and must be provided with toilet paper at all times.</li> <li>Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste.</li> <li>Construction waste must be stored in a designated area.</li> <li>Building rubble must be stored separately from domestic waste and may be stored on bare soil as it is inert in nature. It must, however, be ensured that other waste (general and/or hazardous waste) is not mixed together with the building rubble.</li> <li>Refuse bins must be provided for domestic waste.</li> <li>Large volumes of waste may not accumulate onsite.</li> <li>No waste may be burnt or buried onsite.</li> <li>Building rubble must be kept clean of plastic and brick ties.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Spillages from chemical toilets.	Soil pollution.	To prevent spillages from chemical toilets and ensure that any spillages are cleaned effectively.		<ul style="list-style-type: none"> <li>Sufficient ablution facilities must be provided.</li> <li>Chemical toilets must be serviced regularly.</li> <li>Any spillages from the chemical toilets must immediately be cleaned and the contaminated soil disposed of as hazardous waste. Safe Disposal Certificates must be obtained and kept on record.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
The mixing of concrete.	Soil pollution.	To prevent the contamination of soil during to concrete mixing.		<ul style="list-style-type: none"> <li>Concrete should ideally be mixed on an impermeable surface such as a concrete slab.</li> <li>Cement bags (new and used) must be stored under roof or in closed containers where they will not be exposed to rain.</li> <li>Dry concrete must be removed and disposed of together with other building rubble.</li> <li>Ready-mix concrete trucks may clean chutes into foundations, but not elsewhere onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
Runoff of contaminated stormwater.	Soil pollution.	To prevent the contamination of storm water.		<ul style="list-style-type: none"> <li>Storm water must be diverted around areas where there are pollution sources.</li> <li>Storm water drainage infrastructure must be regularly inspected for obstructions.</li> <li>No contaminated storm water may be released into the environment from the construction activities.</li> <li>Washing or cleaning of equipment or machinery must occur in a designated area and the contaminated wash water must be contained. Such an area could be a plastic drum, a container or a plastic lined pit.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>

**Operational Phase**

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
Operational activities.	Soil pollution due to the incorrect management of chemical substances and dangerous goods.	To prevent the release of pollutants, chemical substances and dangerous goods, such as fuels, into the environment.		<ul style="list-style-type: none"> <li>• Vehicles should regularly be inspected to ensure that any fuel or oil leaks are repaired.</li> <li>• Spill kits must be readily available onsite and personnel must be trained on the appropriate procedures to clean hydrocarbon spillages.</li> <li>• A register must be compiled of all chemical substances and dangerous goods used onsite.</li> <li>• MSDS' (Material Safety Data Sheets) must be maintained for all chemical substances and dangerous goods. The MSDS' must also be displayed onsite.</li> <li>• The chemical substances and dangerous goods must be stored safely and as per the requirements of the MSDS for each chemical substance and dangerous good. Locked storage areas are preferable.</li> <li>• Drip trays must be readily available onsite and used for any repair work, maintenance work of refuelling undertaken onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
Operational activities.	Soil pollution due to poor waste management (general and hazardous waste).	To ensure that waste (general waste and hazardous waste) is managed in an environmentally responsible manner.		<ul style="list-style-type: none"> <li>• Waste must be managed according to its hazard classification (i.e. general vs. hazardous waste). General and hazardous waste streams should not be mixed.</li> <li>• Waste stored onsite must be kept in appropriate containers with lids that can be closed.</li> <li>• Waste must be taken to appropriately licensed facilities for reuse, recycling, recovery or disposal. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• Any soil that has been contaminated by oil, diesel or petrol must be regarded as hazardous and disposed of at an appropriately licensed facility. Safe Disposal Certificates must be obtained and kept on record.</li> <li>• No waste may be stored within wetlands and/or watercourses.</li> <li>• Sufficient ablution facilities must be provided.</li> <li>• Ablution facilities must regularly be cleaned.</li> <li>• Broken or blocked pipes must be repaired immediately.</li> <li>• If toilets run slowly, this should be investigated as this could be the result of a blockage or breakage in a pipe underground.</li> <li>• Refuse bins must be provided for domestic waste.</li> <li>• Large volumes of waste may not accumulate onsite.</li> <li>• No waste may be burnt or buried onsite.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> </ul>
<b>Post-construction and Rehabilitation Phase</b>					
Rehabilitation activities.	Soil erosion due to inefficient rehabilitation of construction areas.	To prevent soil erosion.		<ul style="list-style-type: none"> <li>• Rehabilitation must already be initiated during the construction phase, where possible.</li> <li>• Areas for rehabilitation must be cleared of any building rubble and/or debris before rehabilitation is commenced with.</li> <li>• Soil should be moved when dry, as far as possible.</li> <li>• Weeds must be removed prior to soil replacement.</li> <li>• Areas under rehabilitation must be cordoned off to prevent pedestrian and vehicular access.</li> <li>• Re-vegetation must be undertaken using indigenous species.</li> <li>• Areas under rehabilitation must be monitored to ensure successful vegetation establishment. Organic fertilizers and topsoil should be added to areas where vegetation establishment is not effective.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
Runoff of contaminated stormwater.	Soil pollution.	To prevent the contamination of storm water.		<ul style="list-style-type: none"> <li>• Storm water must be diverted around areas where there are pollution sources.</li> <li>• Storm water drainage infrastructure must be regularly inspected for obstructions.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicant</li> <li>• Construction contractor</li> </ul>
<b>Cumulative Impacts</b>					
Construction and operational activities.	None anticipated.	Not Applicable.			Not Applicable.
<b>Socio-economic Construction Phase</b>					
Construction activities.	Generation of a large number of job opportunities.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
Construction activities.	The stimulation of the local and provincial economy and supply chain	This is a positive impact and no mitigation measures are therefore required.			Not applicable.

Aspect	Impact and Nature	Impact Outcomes	Management	Impact Management Actions and Statements in order to avoid, modify, remedy, control or stop pollution or environmental degradation	Responsible party/person(s)
	industries.				
Construction activities.	Potential increase in crime due to the influx of workers.	To prevent an increase in incidents of crime in die area.		<ul style="list-style-type: none"> <li>Reference checks should be conducted on all workers before they are appointed.</li> <li>Workers should not be allowed to leave the construction site during the day and should be transported to and from the site on a daily basis.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>					
Operational activities.	Generation of a large number of job opportunities.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
Operational activities.	The stimulation of the local and provincial economy and supply chain industries.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
Operational activities.	Contributing to food security in South Africa.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
<b>Post-construction and Rehabilitation Phase</b>					
Rehabilitation activities.	Generation of a large number of job opportunities.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
Rehabilitation activities.	The stimulation of the local and provincial economy and supply chain industries.	This is a positive impact and no mitigation measures are therefore required.			Not applicable.
Rehabilitation activities.	Potential increase in crime due to the influx of workers, especially during the construction phase.	To prevent an increase in incidents of crime in die area.		Same mitigation measures as under construction phase.	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Traffic</b>					
<b>Construction Phase</b>					
Construction activities.	Increase in traffic volumes to the site.	To minimise the effect of an increase in traffic volumes.		<ul style="list-style-type: none"> <li>Avoid using access roads during peak times, as far as possible.</li> <li>Ensure that construction vehicles are roadworthy and that drivers comply with road rules.</li> <li>Loads must be securely fastened and may not exceed the tonnage limitations for each vehicle.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>
<b>Operational Phase</b>					
Operational activities.	Increase in traffic volumes to the site.	To minimise the effect of an increase in traffic volumes.		<ul style="list-style-type: none"> <li>Ensure that construction vehicles are roadworthy and that drivers comply with road rules.</li> <li>Loads must be securely fastened and may not exceed the tonnage limitations for each vehicle.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> </ul>
<b>Post-construction and Rehabilitation Phase</b>					
Rehabilitation activities.	Increase in traffic volumes to the site.	To minimise the effect of an increase in traffic volumes.		<ul style="list-style-type: none"> <li>Avoid using access roads during peak times, as far as possible.</li> <li>Ensure that construction vehicles are roadworthy and that drivers comply with road rules.</li> <li>Loads must be securely fastened and may not exceed the tonnage limitations for each vehicle.</li> </ul>	<ul style="list-style-type: none"> <li>Applicant</li> <li>Construction contractor</li> </ul>

## 8.2 Applicable Environmental Management Standards and Practices

The water quality monitoring programme must be designed and implemented according to the Department of Water Affairs and Forestry, 2006. Best Practice Guideline G3. Water Monitoring Systems document.

No dust monitoring is not required as part of this EMPr.

## 8.3 Applicable provisions of the NEMA, 1998, as amended, regarding closure

The provisions of NEMA, 1998, pertaining to closure are not applicable to this proposed development as the development does not include the prospecting, exploration or extraction of a mineral or petroleum resource.

## 8.4 Applicable provisions of the NEMA, 1998, as amended, regarding financial provision for rehabilitation

The provisions of NEMA, 1998, pertaining to financial provision for rehabilitation are not applicable to this proposed development as the development does not include the prospecting, exploration or extraction of a mineral or petroleum resource.

## 8.5 Method of monitoring the implementation of the impact management actions

### Construction Phase

An independent Environmental Control Officer (ECO) must be appointed to conduct monthly compliance audits during the construction phase of the proposed development. The audits must verify compliance with the Environmental Authorisation and this Environmental Management Programme and a formal report must be compiled after each audit. The reports must be submitted to the Competent Authority. Once the construction phase has been completed, a post-construction audit must be conducted by the independent ECO and the report also submitted to the Competent Authority.

### Operational Phase

An internal ECO must be appointed to conduct monthly compliance audits during the operational phase of the proposed development and to ensure that corrective actions are implemented where required. Reports resulting from these audits do not need to be submitted to the Competent Authority.

An independent ECO must be appointed to conduct annual compliance audits during the operational phase of the proposed development. The audits must verify compliance with the Environmental Authorisation and this Environmental Management Programme and must comply with the requirements of Appendix 7 of the Environmental Impact Assessment Regulations of 2014, as amended. A formal report must be compiled after each audit and the reports must be submitted to the Competent Authority.

## 8.6 The frequency of monitoring the implementation of the impact management actions

### Construction Phase

Monthly independent ECO compliance audits.

### Operational Phase

Monthly internal ECO compliance audits and annual external ECO compliance audits.

## **8.7 Persons who will be responsible for the implementation of the impact management actions**

The applicant is ultimately responsible for the implementation of the impact management actions, during all phases of the development, even where the implementation of the actions may be contracted out to a third party. During the construction phase, sub-contractors will for the most part be carrying out the required impact management actions and these actions should therefore be adequately communicated to the contractors. It is recommended that this document forms part of the tender documentation and contract documentation for all contractors. During the operational phase, the applicant will mostly be responsible for carrying out the required impact management actions.

The applicant must appoint a designated person for the function of internal/in-house ECO and an external, suitably qualified Environmental Assessment Practitioner for the function of external, independent ECO.

## **8.8 Time periods within which the impact management actions must be implemented**

### **Planning and Design Phase**

The management actions for the Planning and Design Phase must be completed before the Pre-construction Phase is commenced with.

### **Pre-construction Phase**

The management actions for the Pre-construction Phase must be completed before the Construction Phase is commenced with.

### **Construction Phase**

The management actions for the Construction Phase must be completed prior to the completion of the Construction Phase (i.e. before the Operational Phase is commenced with).

### **Operational Phase**

The management actions for the Operational Phase must be implemented during the Operational Phase, on a continual basis.

### **Post-construction and Rehabilitation Phase**

The management actions for the Post-construction and Rehabilitation Phase must be completed within one year from the completion of the Construction Phase.

## **8.9 Mechanism for monitoring compliance with the impact management actions**

Please refer to Sections 8.5 and 8.6 of this EMPr.

## 8.10 Program for reporting on compliance, taking into account the requirements as prescribed by the EIA Regulations, 2014, as amended

Table 3: Reporting program

Type of reporting			Reporting Frequency	Authority to report to
<b>Construction Phase</b>				
Monthly independent ECO compliance audits			Monthly, for the duration of the construction phase	Competent Authority (NWREAD)
Post-construction independent ECO compliance audit	phase		Once-off, upon completion of the construction phase	Competent Authority (NWREAD)
<b>Operational Phase</b>				
Monthly independent ECO compliance audits			N/A – Internal reporting	N/A – Internal reporting
Annual external ECO compliance audits			Yearly	Competent Authority (NWREAD)

## 9. ENVIRONMENTAL AWARENESS PLAN

The applicant will ensure that its employees are adequately informed of the environmental risks that may result from work that they conduct onsite and how these risks must be dealt with in order to avoid pollution or the degradation of the environment, through the implementation of this Environmental Awareness Plan.

The Environmental Awareness Plan for the Roodewal Breeder Farm Expansion project consists of two parts, namely, initial Induction Training and ongoing job-specific, Toolbox-talk Training. The same training material will be utilised during both the Induction Training and Toolbox-talk Training.

### Induction Training

Before any employees or contactors commence work at the breeder farm, each individual must undergo an Induction Training session. This is required during the following phases of the proposed project:

- Pre-Construction phase;
- Construction phase;
- Post-construction and rehabilitation phase; and
- Operational phase.

An attendance register must be kept by RCL Foods Limited and each individual who has completed the Induction Training must complete the attendance register. This will also function as an acknowledgement that each individual has understood the training received.

### Toolbox-talk Training

Toolbox-talk Training must be conducted biannually during the operational phase of the proposed development and all operational employees must attend these sessions.

An attendance register must be kept by RCL Foods Limited and each individual who has completed the Toolbox-talk Training must complete the attendance register. This will also function as an acknowledgement that each individual has understood the training received.



### **Training Material**

The same material will be used for both the Induction Training and Toolbox-talk Training sessions and will cover the following topics:

- What is meant by the term “environment”;
- Why the environment requires protection;
- The environmental risks that may result from work that is performed at the breeder farm, during the above mentioned phases of the project;
- How the identified risks may impact upon the environment;
- How the identified risks can be mitigated;
- The protection of workers who refuse to do environmentally hazardous work, as provided for in the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended;
- Environmental Management Programme conditions that are specifically applicable to employee’s work onsite;
- Fire-fighting procedures; and
- Hydrocarbon spill response procedure, including spill kit usage training.

The training can be presented in a verbal format if required.

## **10. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

No specific information has been required by the Competent Authority at this stage of the application process.