BIOSECURITY PLAN

FOR THE

PROPOSED EXPANSION OF A CHICKEN LAYER FACILITY AND ASSOCIATED INFRASTRUCTURE ON PORTION 65 OF THE FARM GROOTVLEI 272 JR, ROOIWAL IN PRETORIA WITHIN THE JURISDICTION OF CITY OF TSHWANE METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

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DOCUMENT CONTROL SHEET				
REVISION **001**	**NAME OF REPORT** **BIOSECURITY PLAN** THE PROPOSED EXPANSION OF A CHICKEN LAYER FACILITY AND ASSOCIATED INFRASTRUCTURE ON PORTION 65 OF THE FARM GROOTVLEI 272 JR, ROOIWAL IN PRETORIA WITHIN THE JURISDICTION OF CITY OF TSHWANE METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE			
	NAME	**DESIGNATION**	**SIGNATURE**	**DATE**
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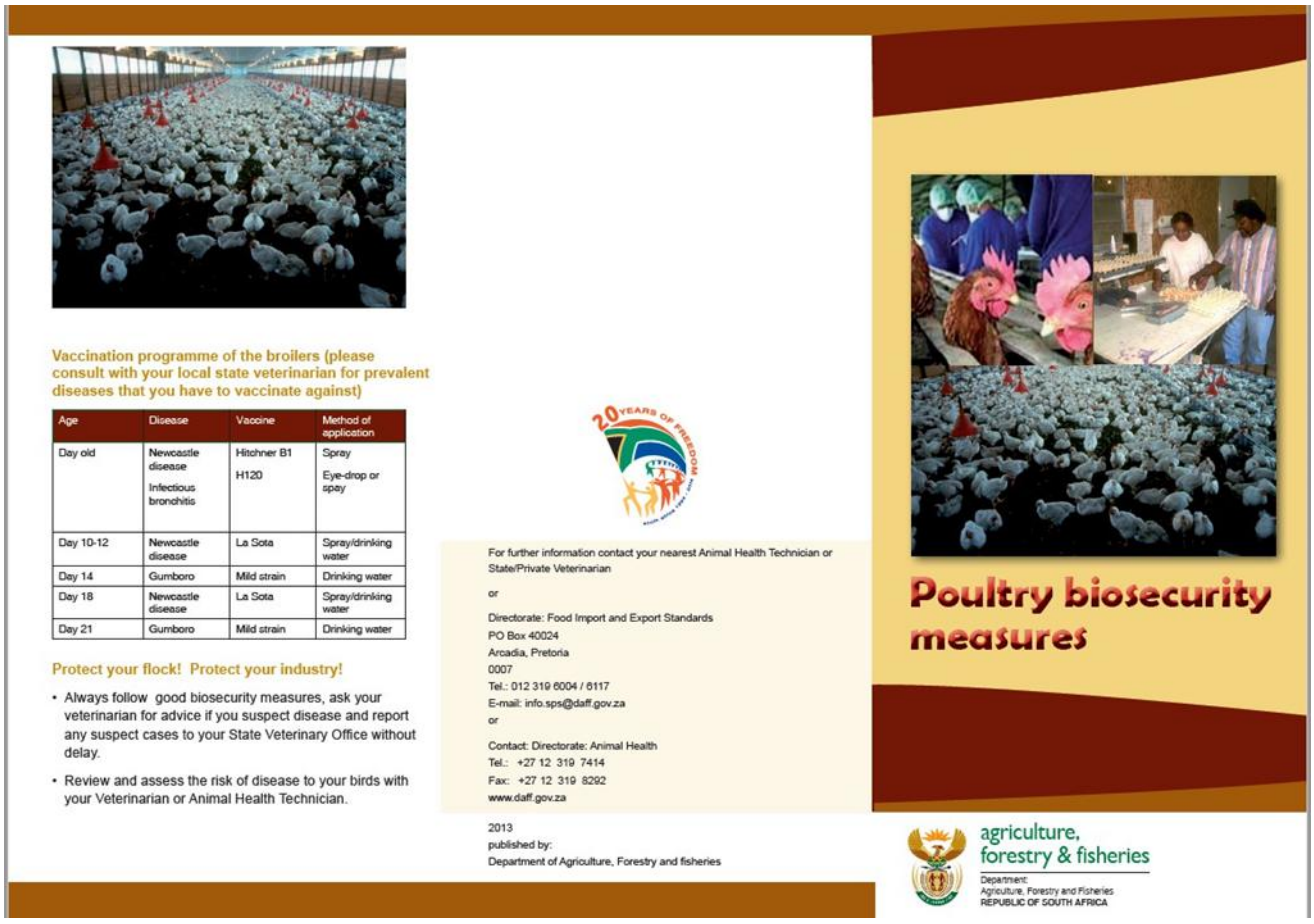
Definitions

Production area -	Includes poultry sheds, egg collection amenities, egg storage areas, egg grading and processing floors, dry storage areas, change rooms, on-site feed production or storage areas, loading pads and truck movement areas and ranges used for free-range production. It should be surrounded by a well-defined perimeter fence with a lockable gate.
Egg storage areas	A cool room where eggs are accumulated having been obtained from a shed or sheds within the immediate vicinity or a centrally located facility where eggs from the entire property are kept/stored.
Egg grading floors	An area where eggs are delivered from the property and graded, packed and sorted ready for storage and eventual distribution.
Egg processing	Where eggs are received from the property and are cracked and processed into a variety of products for storage and distribution.
Property	Refers to the land on which the production area is located and typically includes the facility manager's home or other accommodation and may include other farmland used for livestock or cultivation or waste disposal
Sheds	Refer to roofed fixed buildings, mobile housing and shelters capable of being used for containing poultry securely within their perimeter.
Range	refers to fenced pastures that are, or at times are, accessed by the poultry being farmed.
Spent hens	A hen at the end of her egg-laying cycle is referred to as spent. Pullets

1 INTRODUCTION

Selahle Consultancy and Projects (Pty) Ltd (SCP) as an independent Environmental Consultant was appointed by Viomec Farm (Pty) Ltd, to undertake the Environmental Impact Assessment process for the Proposed Expansion of a Chicken Layer Facility and associated Infrastructure on Portion 65 of the Farm Grootvlei 272 JR at Rooiwal town, located in Pretoria, Gauteng Province of South Africa. Projects of this nature need biosecurity measures for egg production farms. For the control and prevention of endemic diseases on egg production farms other enhancements to these standards may be required and must include vaccination and may include medication.



Vaccination programme of the broilers (please consult with your local state veterinarian for prevalent diseases that you have to vaccinate against)

Age	Disease	Vaccine	Method of application
Day old	Newcastle disease Infectious bronchitis	Hitchner B1 H120	Spray Eye-drop or spay
Day 10-12	Newcastle disease	La Sota	Spray/drinking water
Day 14	Gumboro	Mild strain	Drinking water
Day 18	Newcastle disease	La Sota	Spray/drinking water
Day 21	Gumboro	Mild strain	Drinking water

Protect your flock! Protect your industry!

- Always follow good biosecurity measures, ask your veterinarian for advice if you suspect disease and report any suspect cases to your State Veterinary Office without delay.
- Review and assess the risk of disease to your birds with your Veterinarian or Animal Health Technician.

For further information contact your nearest Animal Health Technician or State/Private Veterinarian

or

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2013
published by:
Department of Agriculture, Forestry and fisheries

Poultry biosecurity measures

agriculture, forestry & fisheries
Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

What are the benefits?

Good biosecurity:

- Helps to prevent diseases not occurring on your farm from entering your farm and those on your farm from spreading to other farms, e.g. diseases such as avian influenza and Newcastle disease, etc.;
- Reduces the risk of zoonotic diseases such as salmonella becoming established; limits the occurrence and spread of diseases and helps to protect your neighbours, public health and the rural areas;
- Improves overall flock health, cuts costs of disease treatment and reduces losses, which could improve the profitability of the farm.

How to prevent poultry diseases?

- What you can do to prevent your birds from becoming sick with diseases like avian influenza, Newcastle disease, ect.
- Plan how you will manage any free ranging and/or wild birds if there is a need to isolate these from broilers.
- Feed and water should be provided indoors, where possible, to reduce contact between your chickens/birds and wild birds.

How does diseases spread?

Diseases are spread through:

- Movement of poultry, people, vehicles and equipment between and within farms;
- The introduction of birds of low or unknown health status;
- Contact with the neighbour's flocks;
- Using/sharing farm equipment and vehicles, which have not been effectively cleansed and disinfected;
- Contact with vermin and wild birds;
- Birds drinking from contaminated water sources;
- Birds eating contaminated feed; and unsatisfactory cleansing and disinfection of vehicles, sheds, feeding troughs and other equipment.

Current and future action Even if you already implement good biosecurity measures, you are encouraged to take the following steps:

- If you farm free-range birds you should plan how you will manage them if there is a need to isolate them from wild birds.
- Water and feed should be provided indoors for free-range birds where possible to reduce contact between your birds and wild birds.
- Look out for the guidance on local risk assessment, available from your local State Veterinary Office.

How to stop disease and keep your farm clean?

Do not bring infection into your farm, or spread it around your farm, on your clothes, footwear or hands

- Strictly limit and control access to poultry flocks.
- Have pressure washers, brushes, water and an approved disinfectant available.
- Clean and disinfect all vehicles thoroughly after each journey.
- Regularly clean and disinfect all crates, containers and other equipment before and after use.
- Keep farm access routes, parking areas, yards, areas around buildings and storage areas clean and tidy and well maintained.

Taking care of your chickens

- The welfare of your birds is always an important concern, and particularly so in the case of a disease outbreak.
- Movement restrictions can have a negative impact on poultry, with confinement potentially leading to health and behavioural problems.
- Allow for appropriate stocking density and avoid overcrowding. Stocking density will be determined by the type of housing and the weather conditions where your farm is situated.
- Having a contingency plan in place will make sure that the welfare of your flock remains a priority at a critical time.

Housing

- The house should face east direction.
- It should be designed to protect the chickens against rodents, wild birds and adverse weather (rain).
- It should contain the relevant equipments.
- Corrugated iron sheets are used for roofing.
- It is advisable to place between 15-20 birds per square metre in the mechanically controlled houses and between10-14 birds per square metre in naturally ventilated/open-sided houses to avoid overcrowding and spread of infections.
- The broilers should not be mixed with other domestic birds.
- The poultry houses should be secured to prevent stock theft.

Record keeping

- Record keeping helps with the indication of the economic progress.
- Helps to monitor health, growth and management practices;
- The simpler the records are the better;
- Manual records are often easier and simpler than computerised records.

There are five vaccination methods of broilers:

- Eye-drop method;
- Spray method;
- Drinking water method;
- Needle through the wing-web method;
- Injection method.

2 LOCALITY

The study area is located 12 km North of Hammanskraal on Portion 65 of the Farm Grootvlei 272 JR, Rooiwal in Pretoria within the Jurisdiction of the City of Tshwane Metropolitan Municipality. The study area will cover an extent of approximately 8.5 Hectares and the proposed study area can be accessed through Kremetart Street & unnamed gravel road in Rooiwal Town. The coordinates for the site are **25°30'37.39"S 28°16'59.28"E** (refer to Figure 1 for the site locality).

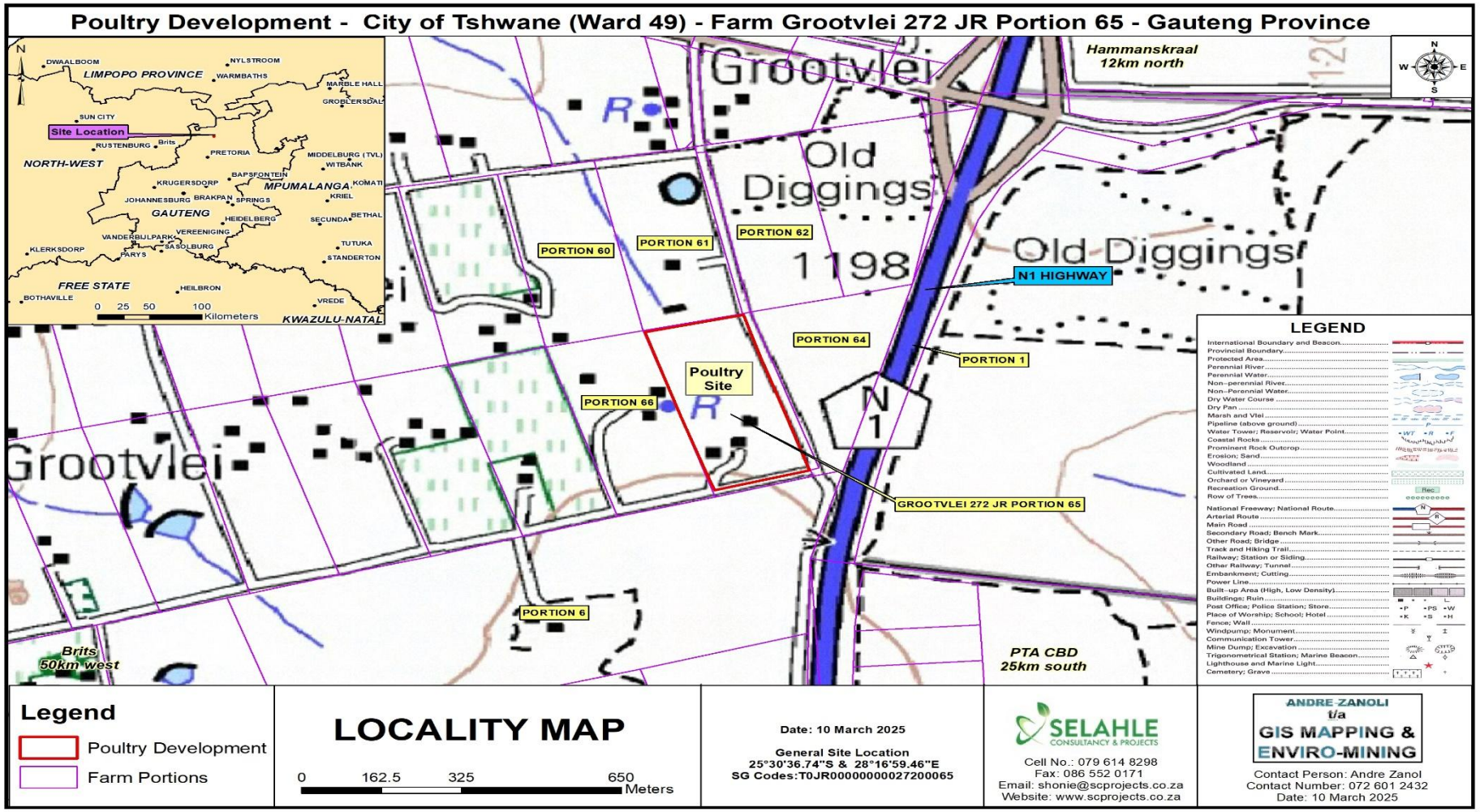

Figure 1: Locality Map of the proposed expansion

3 EGG PRODUCTION BIOSECURITY

3.1 Biosecurity Objectives

- To prevent the introduction of infectious disease agents to poultry.
- To prevent the spread of disease agents from an infected area to an uninfected area.
- To minimise the incidence and spread of microorganisms of public health significance.

Quarantine and biosecurity are essential components of any successful poultry production system. Biosecurity procedures are those taken to prevent or regulate the introduction and spread of infectious pathogens into a flock. Such infectious agents, whether they induce clinical or subclinical disease, dramatically affect a poultry operation's production, profitability, and long-term financial viability. Biosecurity is about risk management to achieve the goals. Each organisation must conduct a risk assessment to determine the amount of risk in each step of its operations and to design and execute control mechanisms suited to these levels of risk.

A risk assessment is necessary because of factors that may affect the biosecurity of the production region. These factors include the location and layout of the property and production area, the source of water supply, the town/province's disease status, proximity to other production areas with birds and other livestock species, the presence and type of wildlife, and the interface with the organisations and/or individual clients that are supplied. Live poultry movements, service people, industry personnel, contractors, delivery of feed and disposables such as egg fillers, manure, used litter, and the transportation of eggs and egg products between facilities are examples of these interactions. The incorporation of all other livestock and pets (dogs, cats, and birds) on the property should be done with caution.

3.2 Pathways of disease and pathogen transmission

3.2.1 Poultry

- Introduction of new birds
- Transfer of birds between production areas
- Dead bird disposal
- Movement of eggs and egg products between establishments
- Other poultry moving through the production area

3.2.2 The farm

- Inadequate cleaning leaving infection in the shed environment and surroundings.

3.2.3 Other animals

- Wild birds by having dams close to farms or lack of bird proofing of sheds
- Wild and domestic animals, including other livestock and pets
- Insects (e.g., flies and external parasites)
- Rodents – rats/mice
- Backyard, fancy poultry and other aviary birds

3.2.4 People

- Farm personnel and family members living on site.
- Contractors, maintenance personnel, neighbours, service personnel and visitors who have recently been on other poultry farms.
- Disease can be transmitted by hands, footwear, clothing and bodily fluids.
- People who have recently recovered from or still suffering from gastrointestinal disease.
- People who have encountered any poultry, pigs/other avian species overseas in the last 5 days.

3.2.5 Equipment

- Housing equipment, husbandry equipment and packing materials.
- Vaccination equipment that has not been cleaned and disinfected.
- Inadequately cleaned equipment from the previous batch of poultry.

3.2.6 Vehicles

- Dirt/manure/contaminants carried on and within cars, trucks and tractors.

3.2.7 Air

- Transmission as an aerosol, dust or air/wind movement from adjacent farms.
- Air transmission from trucks carrying chickens/waste to processing facilities travelling past the farm.

3.2.8 Water supply

- Water supplies including dams may become contaminated by runoff or other birds/animals.
- Water supplies used for shed cooling or drinking that have not been treated adequately.

3.2.9 Feed

- Exposure to rodents and birds at the site of production or on the recipient property.
- Spilt feed around silos encourages wild birds, rodents and other wildlife species.

3.2.10 Litter and waste

- Transport of litter material on/off the farm site as well as storage of used litter or manure on-site.
- Transporting and burial of egg waste and dead birds on site.
- Accumulation of debris on/around the production site that can act as a rodent harbourage.

4 VETERINARY PROFESSIONAL SUPPORT

Consultation with the local state veterinary doctors must form part of the compulsory farm support, as frequently as needed, preferably consult your state vet each production cycle and also consult your private vet or specialist each quarter or as frequently as required. The workers must know how to assess and know the general health of the chickens and also report any unexpected behaviour of the chickens. Workers must be trained on how to identify sickly chickens. Sickly chickens must be removed away from healthy chickens and be culled as per the veterinary guidelines. Any unusual symptoms or high mortalities on the chickens must be reported immediately to the local agricultural extension officers and the state vet. The administration of the vaccination programme for the chickens must be done according to the veterinary doctors' guidelines. The chickens must receive the correct and relevant vaccines.

General chicken diseases to be vaccinated regularly by the State Vet guidelines are:

- Avian Influenza
- Salmonella
- New Castle
- Gumboro
- Infectious Bronchitis
- Brucellosis
- Foot and mouth disease
- Tuberculosis
- Mycoplasma
- And any other chicken disease that may infest the farm.

5 BIOSECURITY PROTOCOLS

5.1 Training and Documentation

Objective: To ensure that all production area employees are aware of and are trained in all necessary biosecurity requirements by ensuring that the:

- Biosecurity plan is available to employees.
- Staff-relevant sections of the document should preferably be displayed within the poultry facility.

- The Staff must be trained in the appropriate sections of the Manual, and such training must be documented, together with a staff statement that they have completed the required training.

6 FACILITY OPERATIONAL STANDARDS

Objective: To limit and manage vehicle, equipment, and human access to poultry production zones, as well as to prevent livestock, wild birds, and other animals (including rodents and insects) from entering by ensuring that:

- A perimeter fence establishing a clearly defined biosecurity zone with adequate signs must surround the production area.
- If livestock grazes on the site, the producing area must be surrounded by a stock-proof fence. Grazing near sheds (i.e., on part of the production area) is only authorised if the grazing area is isolated from the poultry area by a stock- proof barrier, effectively limiting contamination transmission from grazing cattle to poultry. Access to other portions of the production area must not be gained through the grazing area.
- Drainage from livestock pastures or holding grounds must not reach poultry enclosures or locations where fowl can access (e.g., through fences). In free-range egg operations where dogs protect poultry in the range area from attack from other animals or birds of prey, these guard animals should be tested for salmonella-free before the introduction and ideally retested annually.
- A drawing or plan of the property's layout, indicating the production area, sheds, ranges, access roads, and gates, must be developed and kept up to date. Each of the staff and visitors must have easy access to this.
- Geographic separation of farms can reduce the danger of disease spread via aerosols, but it is not a replacement for adequate "on-farm" biosecurity. A biosecurity buffer, for example, will not safeguard a badly maintained flock that enables wild birds unrestricted access to sheds. A poultry enterprise's level of risk varies depending on its nature, size, location, and management. It is also affected by the diseases present, the amount of infection in the flock, the terrain of the place, and the direction of the wind.
- Breeder farms are perceived to be the most economically vulnerable because of the value of the viable eggs obtained from these flocks and the productive life of the flocks (8-12 months).
- Replacement stock should be obtained directly from reliable suppliers with flocks of equivalent or higher health status. Flocks in good health typically buy certified stock from companies that have quality assurance and immunisation programmes that have been approved by farm management.
- Before use, incoming stock should be inspected and housed in a shed that has been cleaned and disinfected. All-in/all-out systems are preferred.
- Litter and feed should also be acquired from authorised vendors that have quality assurance programmes in place that satisfy industry standards. Each set of birds should be given new litter.

- The main entrance to the production area must be able to be closed off to vehicle traffic (e.g., a lockable gate that should be always maintained and secured) and must show suitable notice such as "Biosecurity Area No Entry Unless Authorised" or similar phrasing. Furthermore, visitors must be directed to contact the producer before advancing (i.e., phone number and/or enquire at the house).
- A vehicle disinfection station equipped with a pressure hose should be positioned at the property's entrance gate to clean and disinfect the wheels of cars needing access. Consider disinfecting cars that are leaving the premises and are likely to visit another poultry operation.
- There must be a parking place some distance away for vehicles that are not entering the production area. A changing space away from the sheds and clean protective clothing and boots must be provided. Showering and changing into clean protective farm gear is advisable, especially for pullets who are sensitive to endemic chicken diseases until their vaccination programme is completed.
- Methods for storing and disposing of dead birds must meet appropriate sanitary containment and environmental compliance criteria.
- All poultry housing must be designed and maintained to prevent the entry of wild birds, particularly wild birds of prey, and other animals, as well as to limit vermin access to the greatest extent possible. In free-range operations, there are restrictions to controlling wild birds.
- Free-range landscape - trees (no fruit trees), bushes, and other range amenities should be chosen to reduce the possibility of attracting the types of wild birds that pose a significant biosecurity risk, especially in free-range operations. The area around sheds must be kept clear of debris, vegetation, and surface water accumulation, and it must be mowed regularly to deter wild birds, insects, and rodents, all of which are possible disease vectors.
- The production area should be effectively drained to prevent the collection and stagnation of water that may attract ducks, particularly around sheds and range areas.
- In the production area, only pullets and/or layers are permitted, and no other avian species (including fancy birds and pet birds) or domestic animals are permitted, domestic poultry species can be asymptomatic carriers of the disease (e.g., Salmonella spp.), no other poultry species or backyard (domestic) chickens should be kept in a commercial production plant.
- Feeding systems, including silos, storage bins, feed troughs, and feeder pans, must be safe whenever feasible to prevent access by wild birds and vermin.Feed spills should be cleaned up as soon as possible to avoid attracting wild birds and vermin, and scatter feeding in range areas should be avoided.
- When bird weighing is done, it must be done with the production area's own weighing frames and scales. Company service personnel may use their scales as long as they are cleansed and disinfected before moving them between production zones.
- Before being used on another site, all portable equipment used between sheds and production areas should be physically cleaned, detergent washed, and disinfected. Where there is a risk of ectoparasite transmission, a pesticide should also be considered.

Electrical appliances and other sensitive equipment should be hand-cleaned and disinfected.

- Transferring equipment or disposables that cannot be successfully cleaned and disinfected between sites is not permitted unless the farm shed/facility is depopulated and subjected to terminal disinfection before repopulation with livestock.
- Environmental compliance should not be jeopardised by compromising vegetation barriers. Trees can be used as shelter belts, along fence lines, and on free-roaming grounds to give shade and protection from adverse weather and flying predators. insects that can serve as disease vectors. To manage potholes or water pooling after heavy rain, a range management strategy should be implemented.

7 PERSONNEL STANDARDS AND PROCEDURES

Objective: To minimise the risk of introducing or spreading a disease or contaminant through vehicle and/or people movement, including staff (including production, service and grading floor personnel), contractors, suppliers and other service personnel, visitors and family members and to document such movements to facilitate tracing in case of a concern.

7.1 Production Personnel

While actively engaged in working in the production area, production area personnel or any individual residing on the land, including owners, shall not have contact or interactions with any other poultry, cage birds, ratites (i.e., ostriches), pigeons, or pigs.

- The Production area personnel shall wear clean clothes to work every day or on-farm apparel and footwear after removing street clothes and showering.
- Personnel in the production area, including grading floor personnel, should not move between different operational areas, including production and/or grading facilities, without first assessing the biosecurity concerns.
- The issue of "clean sites" and "dirty sites" for endemic disease must be examined. Personnel movements must always be from clean to unclean areas, not the other way around.
- In an emergency, access can be gained from production zones with lesser biosecurity standards following a shower and complete change of clothing. Footwear should be disinfected, although changing shoes is recommended.
- Pullets are regarded as a clean site in an egg production firm facility (unless specific avian disease testing reveals otherwise), followed by a single-age production site and then a multi-age production site in terms of risk.
- Due to many egg source inputs, the grading floor should be considered the highest risk area, especially if the grading floor accepts eggs and egg products from different sites and companies.

- Employees must declare all abroad trips, including any contact with bird species or pigs. Employees returning from international trips should be prohibited from entering production areas for at least 5 full days (or longer if required by the company).
- Personnel suffering from gastrointestinal disease should not be allowed in the production area until they have recovered clinically. This condition does not stop prospective pathogens like Salmonella from continuing to be carriers.
- In elite breeding facilities where a high disease-free status of the animals is essential, in-touch staff should be tested for Salmonella regularly.

7.2 Company service personnel

- Company service staff may be required to visit various production areas on a single day. Wherever possible, this technique should be avoided. In the production area, site-specific protective clothes and footwear should be worn. Showering of personnel at the moment of entry is the desired procedure.
- Visits should always begin in 'clean' locations, such as the house, pullets (younger to older), or locales with confirmed endemic disease-free status. If necessary, visits from manufacturing locations with lower known endemic disease status may be made after a shower and a complete change of clothing. Footwear should be disinfected, although changing shoes is recommended.

7.3 Maintenance and repair

- Repair and maintenance contractors who have had contact with poultry or other birds that day must not enter sheds and/or ranges populated or ready to be populated with birds unless (a) it is an emergency and (b) they have showered and changed into site-dedicated clothes and boots, wear a hair covering, and follow the facility biosecurity practices.
- When using a single-age batch system, routine maintenance should be performed between batches before final disinfection, if possible, before entering sheds, tools and personal equipment brought into the production area must be decontaminated to remove dust and organic matter.

7.4 Contractors, suppliers, other service personnel and visitors

- **Rules of admission to poultry sheds and poultry ranges**

All visitors must agree to abide by the entry rules of the farm (which must be conspicuously placed near the Visitors' Log). Before guests may enter sheds and ranges, all visits must be approved by the manager. This rule also applies to vaccination teams.

- **Visitors' Log**

A record of all visitors to the poultry sheds and poultry ranges, including contractors and business workers, must be kept. All visitors must sign in and exit.

- **Exceptions**

Farm personnel covered by the Personnel Quarantine Declaration (Appendix 2) are the only people who may enter the sheds, poultry ranges, and grading facilities without signing the Visitors' Log. When visiting the farm, all contractors involved in live bird transfers, egg and egg product transportation, vaccination crews, dead bird and waste removal, and feed delivery must sign in to allow traceability of all personnel movement and operations.

- All contractors must be fully informed of the biosecurity precautions that apply to the site. All the entrance conditions may not apply to all contractors.
- Any authorised visitor (including owners, neighbours, friends, family, other producers, or equipment suppliers) who is likely to have been exposed to poultry, other commercial poultry, backyard, fanciers and other aviary bids, egg handling/poultry processing establishments, or pigs on that day must not enter the sheds unless they have had a shower and changed clothes and boots, or must limit their visit to the property's residence while wearing clean clothes.
- Visitors suggest a 48-hour stand-down period before showering and entering the manufacturing area in clean clothing and footwear.
- Unless it is necessary (e.g., maintenance contractors), all visitors must park their cars outside the manufacturing area.
- Where vehicular access is required, the vehicle's movement history should be investigated, and the vehicle should preferably be cleansed and disinfected at the entry point. It is critical to carefully evaluate the potential internal contamination of the vehicle, particularly the driver's footwells. Non-essential vehicles should be parked at least 30 metres away from the production area, preferably in a barrier-secured area.

7.5 Requirements for Specific Movements

Objective: To minimise the risk of introduction of disease or contaminants by specified movements.

- **Pick-up of pullets and spent hens**

Pick-up crews (whether contracted or in-house) shall only transport one single-age pullet flock from any given production region on any given day. Pick-up workers must not keep birds or livestock, including pigs, at their residences and must be trained and mentored in biosecurity and welfare fundamentals. They must sign certifications stating that they have been taught and are aware of the quarantine rules. Between farms, pick-up vehicles, modules, and crates must be completely cleaned, detergent washed, and disinfected. Before entering the farm, the vehicle and trailer should be thoroughly inspected, and the movements of the driver and crew should be authenticated. The pick-up teams' boots and gear should also be clean. Prior communications should ensure that the contractor understands their biosecurity responsibilities and the poultry farm operator's policies.

- **Delivery of day-old chicks**

Trucks and chick boxes must be cleaned and disinfected every day and between homes. Before each delivery, drivers must put on clean protective clothing and footwear. Sanitation of hands is required. Where the chick delivery vehicle must visit multiple farms during a single delivery run, precautions must be taken to reduce the possibility of infectious agent transfer between properties.

This would entail visiting authorised rearing farms first, followed by mixed rearing and producing farms, with off-loading equipment and chick boxes confined to the clean and disinfected placement shed. In addition, each property's endemic illness status must be known.

- All farms should maintain an approved suppliers list that outlines the allowed firms for each activity as well as the checks and guarantees given by each company to uphold the site's biosecurity criteria.
- There must be a mechanism in place for tracking delivery crew movements (for example, through delivery paperwork and feed company records).
- Dead bird pick-up vehicles should not enter farms.
- Fresh litter distribution and collection of manure and old litter should be limited to those tasks.
- Vehicles transporting new litter should be from respectable companies and should not be utilised to transport used litter and manure.
- Trucks carrying manure and used litter should not be used for backloading grain unless a complete cleaning programme has been implemented and all parties for other deliveries (e.g., feed) - drivers must not enter sheds, wear protective equipment and boots and keep to the immediate vicinity of the truck and trailer.
- External feed providers should be certified and have internal biosecurity and hygiene regulations that poultry producers can access.

7.6 Entry procedures for poultry sheds and ranges

Objective: To prevent the introduction of disease agents and contaminants entering bird sheds and ranges through people's movements.

- Any person entering sheds must sanitise their hands and use footbaths (unless separate shed-specific boots or other ways to minimise organic material into the shed are being used) before entering each shed and exiting if going into another production facility.
- To prevent diseases from entering the production area, it is ideal to have distinct shed boots for each shed/producing facility (including free-range activities). Persons who have been in earlier sheds that may have compromised the birds in another shed due to positive endemic disease status should only enter after showering and changing into farm-based attire. This is often required when transitioning from farm production regions to raising and pullet facilities.
- Before disinfection in the footbaths, the bottoms of the boots must be scraped and free of any adherent organic debris. Footbaths must be inspected regularly (for example, for excessive organic matter) and the contents replaced as needed to ensure an acceptable concentration of suitable disinfectant used in accordance with the company or manufacturer's instructions. It's best to keep the footbath away from anything that could deactivate the disinfectant.
- Hand sanitizer or a comparable alternative must be accessible at all shed entrances and used before entry.
- Before access, facilities for cleaning and disinfecting equipment should be available.

- The habit of having a change of boots and coveralls to put over clothing at the shed door is the ideal approach for going between like sheds and impedes worker movement as little as possible.

8 OPERATIONAL STANDARDS

8.1 Water supply

Objective: The goal is to ensure that the water used in poultry sheds for drinking, cooling, and washing is of livestock-safe quality.

It is vital to achieve effective biosecurity by using a high-quality water source that is free of dangerous avian infections. Effective treatment of surface water and roof runoff water to limit pollution and eradicate avian disease pathogens is critical, but it can be technically challenging. Any water treatment process should be checked regularly.
Water with a high quantity of organic matter, or with a low or high pH, cannot be properly sanitised without the proper pre-treatment, such as filtering. Water treatment with ultraviolet light is limited to low flow rate pure water with no turbidity. To ensure a safe water supply, it may be important to seek expert advice.

- At the continuous point of drinking by the birds, a chlorinated water supply treatment must attain a level of 1.0 - 2.0 ppm Free Available Chlorine (FAC). Effectively chlorinated water may test negative for FAC after sitting in storage for extended periods, but this is still acceptable if the water storage is sealed. This is frequently the case for manually handling numerous water tanks or early morning water entering the shed right after the lights are turned on.
- When chlorinating water, a minimum of 2 hours of contact time with chlorine is required before usage. The effective level of FAC required over these two hours can vary due to variations in water quality. The Oxidation Reduction Potential (ORP) of treated waters, which should be about 650 mv, is one of the most precise techniques to assess if the chlorine level is effective. This should be done in tandem with monitoring the pH of the water, which may need to be adjusted. This figure (650 mv) applies to any oxidative chemical used to sanitise water.
- Water sanitation tests must be performed and recorded daily, and a maintenance programme must be implemented.
- Chlorine dioxide water sanitisation systems are becoming more popular in the poultry sector and have advantages over sodium hypochlorite chlorination.
- Water treatment systems, including alternative methods (e.g., UV), must be evaluated before use, and treatment systems require a maintenance and monitoring strategy to guarantee effectiveness.
- Production area data must be preserved to demonstrate the effectiveness of water treatment. Microbiological validation of the treatment system's efficacy must be performed

at least once a year. Producers should consult the National Water Biosecurity Manual - Poultry Production for further information on water biosecurity.

- The quality of drinking water must be kept at a level adequate for use in cattle.

9 VERMIN BAITING

Objective: To minimise the potential for the introduction of infectious agents and pathogens by vermin, foxes, wild dogs and cats and in particular, rodents, through their presence in the production area. Procedures should be in place to prevent wild bird aggregation and the aversion of wild ducks.

- A suitable management strategy that includes provisions for dealing with rodents, roaming dogs and cats must be established and implemented. This includes making certain that any baits used are licenced and approved for the particular vermin species.
- Bait stations must be strategically located around the sheds, as indicated by vermin species, tracking routes, and movements within the facility. In places where there is evidence of increasing rodent activity, the number of bait stations should be increased.
- Bait stations must be numbered, and their locations documented on a map.
- Bait stations must be checked regularly using a risk-based approach, and fresh baits must be set as needed and each inspection and any activity should be documented.
- Bait stations must be adequately secured and tamperproof to prevent other mammals, natural species, and birds from accessing the bait.
- Other methods of rodent management, such as traps and sonic sound aversion devices, may also be used.
- The chemical ingredient utilised in rodenticides should ideally be of the second generation, with low volume intake and rapid lethal action. The acceptability of rodenticides and their effectiveness should also be evaluated.
- Dead vermin should be removed promptly and appropriately to avoid scavenging by poultry and other animals within production areas.

9.1 Cleaning, ground and amenities maintenance

Objective: To reduce the likelihood of the introduction of disease agents and contaminants into poultry sheds and enclosures and reduce the attraction of rodents and wild birds to production areas.

- Long grass invites rodents and promotes the survival of viruses and germs on and around the production area, thus it must be maintained and mowed.
- To minimise water collection and stagnation, the free-range area must be adequately drained. The space must also be shaped to prevent runoff water from other portions of the land from entering.
- The usage of untreated manure or litter on adjacent land to the free-range zones from other parts of the poultry operation or other poultry farms should consider the spread of potential

endemic disease agents, such as Salmonella. To eliminate these dangers, windrow composting or off-site disposal is ideal.

- If the farm cannot treat the manure and used litter on the farm, the company that collects/purchases the manure and used litter must have measures in place to treat the manure and used litter before they can on- sell products as fertiliser for crop production and horticultural use.
- The characteristics of the pathogens determine the control and elimination of endemic infections between batches in free-range environments. The majority of other avian diseases and intestinal worm eggs require hot, dry conditions to be desiccated. As a result, several endemic diseases can be expected to persist across batches in free-range systems under normal conditions. This is where effective immunisation against a wide range of avian endemic illnesses in pullets before transfer becomes a key instrument in any biosecurity programme. This is in addition to a routine worming programme.
- To reduce the danger of a biosecurity incursion, monitor and examine unusual symptoms of disease and mortality in wildlife in regions surrounding production zones (particularly birds).

9.2 Record keeping

Objective: To assist early detection of animal health issues and the response to any biosecurity breach.

- Bird mortality, feed and water consumption, and production data must all be documented regularly to aid in the detection of any odd animal health concerns that could indicate a biosecurity breach.
- A record of bird movements must be kept aiding in tracking in the event of an animal health or food safety risk.
- Before the bird transfer, a batch summary document identifying all immunisations, treatments, and monitoring techniques and outcomes for each batch of pullets should be created and made accessible to the producing farm. This is done so that corrective steps, such as revaccination, can be conducted if serological evidence shows it is necessary or where a contingency is required for a health status change, such as with Salmonella.

9.3 Egg grading floors

- The egg grading floor can be positioned within egg production facilities, directly connected to a variety of sheds via conveyor belts or brought in from other sheds using internal vehicles. As a result, the disease status of the grading floor is the same as that of the "dirtiest" manufacturing shed. Before returning portable egg handling equipment to the shed, it must be cleaned and disinfected.
- The high degree of horizontal contact in centralised isolated grading floors with inputs from various sheds and farms raises the potential of endemic disease transmission between properties. It is necessary to guarantee that vehicles, persons, and egg-handling equipment (such as fillers, trolleys, and pallets) do not cross-contaminate and/or transfer

avian infections to previously contaminated eggs. This has been how egg drop syndrome (EDS) infection has historically been spread amongst layer farms.

- Reusing cardboard egg flats is a particularly risky method for spreading chicken diseases between homes. When grading flooring from various properties, clean and disinfected plastic fillers or heat-treated cardboard flats should be used, rather than the less desirable option of marked fillers (colour-coded for each farm) with a property identity.

9.4 Egg processing floors

Due to the growing quantity of eggs from various properties, diverse egg production kinds, and the wide geographical dispersion, the dangers of egg processing plants spreading avian infectious diseases are potentially larger.

10 REFERENCES

Animal Diseases Act, 1984 (Act No. 35 of 1984)

Poultry Biosecurity Measures by the Department of Agriculture, Forestry and Fisheries, 2013
Biosecurity guidelines: South African Poultry Association (SAPA)

Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947.

Appendix 1 – Production area audit checklist

Viomec Farm Biosecurity Manual – For Egg Production

Audit date:	
Auditor's Name:	**Auditee's Name:**
Auditor's Signature	**Auditee's Signature**

1.0	Documentation and training	Yes	No	N/A	Corrective action
1.1	Is a copy of the current Farm Biosecurity Manual for Egg Production held in the production area and readily available?				
1.2	Have staff been given instruction in the relevant parts of the Manual?				
1.3	Is a record kept of all relevant training received by employees?				
1.4	Is a bird mortality, feed and water register being maintained?				
1.5	Is an appropriate bird movement register being maintained?				

2.0	Facility standards	Yes	No	N/A	Corrective action
2.1	Does the production area have a perimeter fence, quarantine signage and can access routes be closed off to prevent vehicle entry?				
2.2	Is there a site map clearly defining the production area and the property, including all access roads and gates?				
2.3	Is there adequate signage to inform visitors of the Biosecure Area and what action they should take?				
2.4	Is there an off-site parking area for visitors?				
2.5	Are footbaths or a change of footwear available or ways to minimise organic material used at all entrances allowing personnel access to sheds?				
2.6	Are the footbaths, where used, inspected daily and replenished as required? And covered when not in use?				
2.7	Is the area around the sheds neat and tidy? E.g., mown grass.				
2.8	Is hand sanitizer or washing facilities available and used at all entrances allowing personnel access to sheds?				
2.9	Are other livestock excluded from the production area or effectively restricted to areas so that their feces cannot come in contact with poultry either directly or indirectly, e.g., water draining into poultry areas/sheds?				
2.10	Are the sheds bird proof?				
2.11	Are no other pet caged, avian species or intensive animals held on the property?				
2.12	Is equipment properly cleaned and disinfected between production areas?				
2.13	Is there a vehicle disinfection station located at the entrance gate?				

NOTES:

3.0	Personnel standards	Yes	No	N/A	Corrective action
3.1	Is there a signed Personnel Quarantine Declaration for each employee?				
3.2	Is there a Visitors Log and are all production area visitors required to complete their details in the book?				
3.3	Are the conditions of entry to the production area prominently displayed near the Visitors Log?				
NOTES:					

4.0	Water treatment	Yes	No	N/A	Corrective action
4.1	Is there a water sanitizing system in place for the drinking and cooling water?				
4.2	If chlorination or an alternative such as chlorine dioxide is used, is the level tested daily and recorded?				
4.3	If another sanitizing system is used, is there a system in place to ensure that the water is being sanitized effectively?				
4.4	Is the effectiveness of the sanitizing confirmed by independent microbiological testing at least once a year if required?				
NOTES:					

5.0	Vermin control program and rodent baiting program	Yes	No	N/A	Corrective action
5.1	Is there an appropriate vermin control strategy documented?				
5.2	Is there a rodent baiting program in place in the production area?				
5.3	Is there a plan showing the location of bait stations and are they properly secure and tamperproof?				
5.4	Are the baits regularly checked for activity and replaced; and is there a record of this process?				
5.5	Are dead vermin removed promptly and appropriately to avoid scavenging by poultry within production areas and other animals outside production areas?				
NOTES:					

6.0	Cleaning and ground maintenance	Yes	No	N/A	Corrective action
6.1	Has spilt feed been cleaned up around silos?				
6.2	Is the feed system closed to prevent contamination of feed by rodents and birds?				
6.3	Is there adequate drainage of the free-range area?				
NOTES:					

7.0	Dead bird disposal	Yes	No	N/A	Corrective action
7.1	Is there an appropriate procedure in place for the disposal of dead birds?				
7.2	Is the procedure both environmentally sound and biosecure?				
NOTES:					

8.0	Facility/company specific requirements	Yes	No	N/A	Corrective action
8.1	Are there dams on the property that allow wild waterfowl to congregate?				
NOTES:					

Appendix 2 – Personnel quarantine declaration

(Production Area Employee)

I, _____hereby agree to abide by MY EMPLOYER'S (Viomec Farm) BIOSECURITY rules and standards.

I understand that the following quarantine rules/standards apply at all times:

1. No avian species are to be kept at my place of residence i.e., no poultry or birds of any type (e.g., ostriches, aviary birds or racing pigeons). If any exemptions to this are approved by the employer, I must shower and change clothes before entering the production area, I will adhere to their required quarantine period and other requirements.
2. No other domestic livestock are to be kept at my place of residence without approval.
3. No untreated poultry manure from other properties is to be used at my place of residence.
4. No member of my household is to work in any area where contact can be made with poultry or other processing facilities without approval. For example, on other properties or at hatcheries, processing plants, by-product plants, laboratories or with pick-up crews, unless I shower and change clothes before commencing work or they work on the same farm.
5. I will not visit poultry abattoirs, livestock production areas or poultry shows unless approved by my employer and appropriate quarantine measures are taken.
6. Any overseas travel is to be declared with the employer, including whether contact with any poultry, pigs or other avian species was made while travelling.
7. I will advise my employer if I am experiencing flu-like or gastrointestinal symptoms and will not work in the production areas until clinically recovered.

Signature …… Date ……..……

Residential Address ……

Appendix 3 – Visitor's Log

By signing this visitor's log, you agree to comply with the conditions as detailed in the accompanying list of conditions of entry. All visitors entering poultry sheds or ranges must sign this log.

Date	Name	Company & contact number	Vehicle reg. number	Poultry/ livestock contact in last 48 hours?	Reason for visit	Recent overseas travel and dates	Time in	Signature	Time out	Signature