



Local Government Air Quality Toolkit

# Egg production guidance note

Information on good design and management practices to  
reduce air emissions from egg production

## Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

© 2024 State of NSW

With the exception of photographs, the State of NSW, Environment Protection Authority and Department of Climate Change, Energy, the Environment and Water (the department) are pleased to allow this material to be reproduced in whole or in part for educational and non-commercial use, provided the meaning is unchanged and its source, publisher and authorship are acknowledged. Specific permission is required to reproduce photographs.

Learn more about our copyright and disclaimer at [nsw.gov.au/copyright](https://nsw.gov.au/copyright)

The Local Government Air Quality Toolkit has been developed by Department of Climate Change, Energy, the Environment and Water in collaboration with the NSW Environment Protection Authority, the NSW Department of Planning, Housing and Infrastructure, Local Government NSW and local councils.

Cover photo: Caged hens. Barbara Gibbons/iStock

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

Published by:  
Environment Protection Authority and  
Department of Climate Change,  
Energy, the Environment and Water  
Locked Bag 5022, Parramatta NSW 2124  
Phone: +61 2 9995 5000 (switchboard)  
Phone: 1300 361 967 (Environment and Heritage enquiries)  
TTY users: phone 133 677, then ask for 1300 361 967  
Speak and listen users: phone 1300 555 727, then ask for 1300 361 967  
Email [info@environment.nsw.gov.au](mailto:info@environment.nsw.gov.au)  
Website [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)

ISBN 978-1-923200-85-2  
EH 2024/0191 July 2024

Find out more at:

[nsw.gov.au/dcceew](https://nsw.gov.au/dcceew)



# Contents

|     |  |    |
|-----|--|----|
| 1.  | Introduction   | 1  |
| 1.1 | Industry overview                                      | 1  |
| 1.2 | Egg production housing – facility design and structure | 2  |
| 2.  | Potential emissions to air                             | 3  |
| 2.1 | Overview   | 3  |
| 2.2 | Odour  | 4  |
| 2.3 | Dust   | 4  |
| 3.  | Managing air pollution                                 | 5  |
| 3.1 | Location of production facilities                      | 5  |
| 3.2 | Managing odour   | 8  |
| 3.3 | Managing dust  | 11 |
| 4.  | Considerations for local councils                      | 12 |
| 4.1 | Scheduled or non-scheduled activity                    | 12 |
| 4.2 | Compliance testing                                     | 14 |
| 4.3 | Assessment and dispersion modelling                    | 14 |
| 4.4 | Operational and control recommendations                | 14 |
| 5.  | References and other resources                         | 18 |

## List of figures

|          |  |    |
|----------|--|----|
| Figure 1 | Egg production process diagram showing air quality issues for each stage | 3  |
| Figure 2 | Feed silos   | 4  |
| Figure 3 | Separation distance when 2 farms are considered separately               | 8  |
| Figure 4 | Example of a windbreak wall at the end of a chicken shed                 | 10 |
| Figure 5 | Example of a chicken litter pile   | 16 |

# 1. Introduction

## 1.1 Industry overview

This guidance note provides general information on good design and management practices to reduce air emissions from egg production. It does not cover animal health and work health and safety.

Egg production facilities that have the capacity to accommodate more than 250,000 birds are scheduled activities under the *Protection of the Environment Operations Act 1997* (the POEO Act), being 'livestock intensive activities'. Scheduled activities require an environment protection licence and the NSW Environment Protection Authority (EPA) is the appropriate regulatory authority (ARA) for the purposes of the POEO Act.

Local government is the ARA in relation to egg farms with fewer than 250,000 birds.

There are many similarities between egg production and poultry production, both being based on managing large numbers of chickens. However, there is a separate guidance note in the Local Government Air Quality Toolkit for chicken meat production.

Local councils can influence the initial siting of all intensive agricultural industries through land-use planning and the development approval process. This is usually the most important decision on air quality management for these premises.

The environmental management and resolution of any off-site odour or dust impacts are the direct responsibility of the site operator.

### Breeding farms

Breeding farms keep both breeding hens and roosters to produce fertile eggs. The birds that produce the egg chickens are known as parent or secondary stock. They are housed in large, deep-litter sheds. The eggs produced by the parent stock are collected daily and stored for transport to the hatchery.

It is common for breeding birds to be removed for meat processing at the end of their 12-month productive life. The litter is cleaned from the sheds at the end of each 12-month cycle and the process starts again.

### Hatcheries

Hatcheries incubate the eggs from the parent stock until they hatch. The chickens produced are consigned to egg chicken farms within hours of hatching. They are promptly graded for quality, sexed and vaccinated. They are then either kept on site for laying hens or sold to other egg farms as pullets or day-old chicks. Because egg farms and breeder farms have different requirements, egg producers often purchase day-old chicks or pullets (young birds), rather than operating their own breeder farm.

### Production systems

In most operations, day-old chicks are obtained from hatcheries and reared to around 17 weeks, when they begin to lay.

At around 21 weeks of age the birds reach about 50% of their productive capacity, which peaks at around 27 weeks. By about 80–85 weeks the productivity of the birds has significantly declined and they are removed for slaughter.

There are 3 distinct egg production systems:

- caged hens
- barns
- free-range systems.

Each has different impacts on air quality.

## 1.2 Egg production housing – facility design and structure

### Caged hens

Caged systems have steadily been decreasing however, as of 2023, still represent over 40% of egg production in New South Wales. Modern cages (environmental cages) must meet the *Australian Animal Welfare Standards and Guidelines for Poultry* (DAFF 2022):

- Modern cages have computerised climate control and tunnel ventilation.
- Many of the modern environment control systems include automated feeding systems.
- Most of these cages are also fitted with manure belts that collect the manure from under the cages and automatically remove it from the sheds.
- These manure belts are often fitted with a drying system that removes moisture from the manure.
- Cages are designed to allow eggs to roll clear of the hens for daily collection either manually or automatically via a conveyor belt.

### Barns

The barn system in New South Wales represents about 2% of the eggs produced. These systems generally consist of an automated deep-litter system, with the hens group-housed in sheds with nest boxes and perches. No more than two-thirds of the shed is slatted. The flooring of the barn consists of litter, slats or wire.

The space allocation per bird is greater in barn systems than in cages. Barn systems generally have lower production than cage systems, although this can partly be overcome with recent advances in management.

### Free-range systems

Free-range accommodation represents about 50% of eggs produced in New South Wales. The average flock size is much smaller than in the other systems, typically only 1,000–2,000 birds. However, a few free-range farms in New South Wales have flock sizes ranging from 5,000–20,000 birds.

Free-range systems consist of a weatherproof shed where hens can roost, lay, drink and eat. Adjoining the shed is an outdoor range. The sheds protect the birds from the elements and predators while the free-range area allows them access to open space and vegetation.

Free-range egg production is considerably more expensive than the alternatives because of the greater land area needed, increased labour requirements, higher feed consumption and small economies of scale. Mortality rates can be considerably higher.



## 2. Potential emissions to air

### 2.1 Overview

All air pollutants should be considered during the planning process and addressed within consent conditions, where relevant. The site operator is responsible for compliance with all consent conditions. The main air emissions relevant to egg production are odour and dust.

Figure 1 represents the flow of by-products through a typical egg production farm and the relevant air quality issues with each stage of the production system.

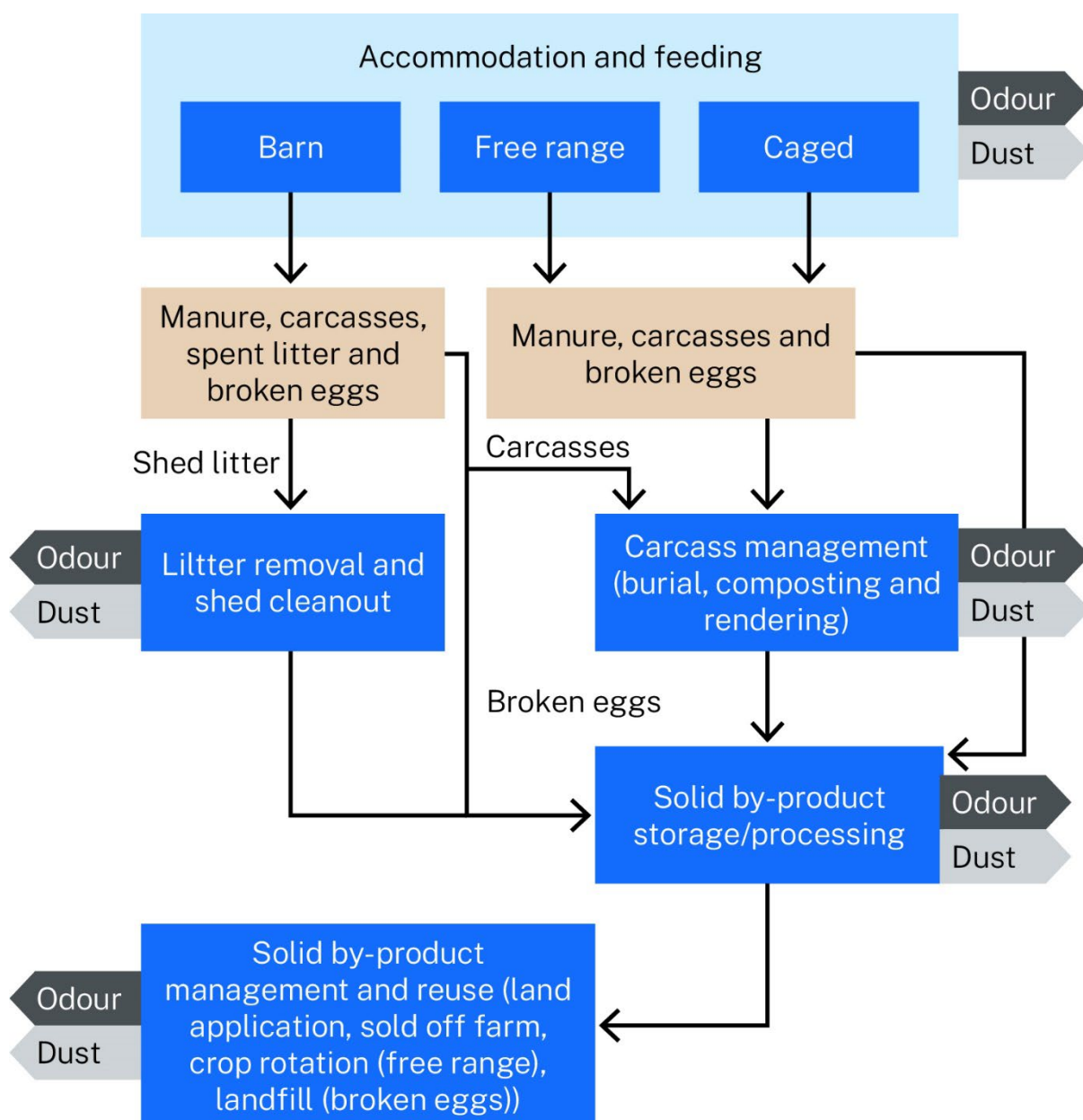


Figure 1 Egg production process diagram showing air quality issues for each stage

## 2.2 Odour

Odours from egg production arise from:

- manure, and moving and storage of the manure
- high moisture in litter
- cleaning out shed litter between cycles
- composting litter materials
- applying stored or treated bird waste to land
- disposing of bird carcasses
- transporting treated and untreated wastes off site.

## 2.3 Dust

Dust from egg production arises from:

- cleaning out shed litter between cycles
- applying stored or treated bird waste to land
- handling feed materials (Figure 2)
- transporting treated and untreated wastes off site.



**Figure 2**      **Feed silos**  
Source: Naypong/iStock

## 3. Managing air pollution

Control mechanisms that egg producers can use to minimise air pollution are limited where:

- anaerobic processes (the processes by which bacteria break down organic matter in the absence of oxygen) are necessarily involved
- large odorous surface areas are exposed
- large ventilation air flows through sheds and cages are needed to maintain suitable production conditions.

Management that promotes aerobic breakdown or complete anaerobic breakdown of manure results in less odour.

The following sections outline a number of mitigation methods and best practice measures that operators can employ to reduce their air emissions and environmental impact.

### 3.1 Location of production facilities

As noted in Chapter 1, local councils can influence the initial siting of a production facility through the development approval process. Siting the operation well by considering its proximity to neighbours is critical, because dispersion is the main method of managing off-site impacts of both odour and dust.<sup>1</sup>

Many existing egg production facilities in New South Wales, and Australia in general, are in outer-fringe urban areas. In New South Wales, this includes egg production facilities located in the northwest, west and southwest of Greater Sydney, and on the Newcastle urban fringe. These areas were often semi-rural when the facilities were first established, but increasing urban or semi-urban development continues to encroach on operations, with resulting consequences for neighbourhood amenity leading to complaints.

The use of appropriate separation or buffer distances is a widely recognised method of mitigating off-site odour impacts. The fundamental principle is that fugitive odour and dust emissions tend to radiate out from a source and are diluted along the way.<sup>2</sup>

Controlling such air emissions with pollution control equipment is often not feasible for the large areas / air volumes involved, so separation distance is the most practical means of dispersion. Thorough assessment at the approval stage is therefore very important. However, in some instances it may be feasible to introduce vertical vents for mechanically ventilated poultry sheds, and this should be considered as an odour management option.

---

<sup>1</sup> The fundamentals of dispersion and how this affects air quality are discussed in the Local Government Air Quality Toolkit – Module 3, *Air pollution control techniques*.

<sup>2</sup> Fugitive emissions are uncontrolled emissions that do not arise from controlled point sources, such as vents, stacks, ducts and exhausts. They typically arise from evaporation, windblown or mechanical disturbances. It is usually impractical or impossible to capture or contain such emissions – hence they are termed ‘fugitive’.



The *Technical Framework: Assessment and management of odour from stationary sources in NSW* (DEC 2006a) and the accompanying *Technical Notes: Assessment and management of odour from stationary sources in NSW* (DEC 2006b) outline a Level 1, or screening, assessment procedure for large diffuse sources such as egg production farms. This is to determine whether a new facility is likely to cause odour impacts, primarily based on a calculation for optimum separation distance for the number of birds at that facility.

Appendix A of the *Egg Industry Environmental Guidelines* (Australian Eggs 2018) describes a similar, but slightly different, industry specific S-factor formula to determine the risk-based separation distances between egg layer farms and sensitive receptors. As it is more recent and specific to the egg industry, it is recommended this method be used in preference to one in the *Technical Framework*.

The S-factor approach can be used to assess if the available separation distances would be sufficient for a proposed new egg layer facility or an expansion of an existing facility.

Whether a facility is likely to cause odour impacts is primarily based on a calculation for optimum separation distance for the number of birds at that facility.

The Australian Eggs documentation shows this equation as follows:

$$D = (N / 1000)^{0.63} \times S$$

N = Number of birds

S = Composite site factor (S1 x S2 x S3 x S4 (optional))

The composite site factors are determined according to site-specific information relating to:

- sensitive land-use factor
- land surface roughness factor
- terrain weighting factor
- wind frequency factor (optional).

Each of these factors is described in detail in Appendix A of the *Egg Industry Environmental Guidelines*, however a worked example is provided below.

## Worked example

**Scenario:** A layer farm with 30,000 birds, within a rural zone, limited groundcover with few trees, in a broad valley.

### Site data

| S factor | Value | Feature                      | Reference in Australian Eggs 2018 |
|----------|-------|------------------------------|-----------------------------------|
| S1       | 20    | Rural zone                   | Table 5 (Appendix A)              |
| S2       | 1.0   | Few trees                    | Table 6 (Appendix A)              |
| S3       | 1.2   | Broad valley with slopes <2% | Table 7 (Appendix A)              |
| S4       | 1.0   | Based on local meteorology   | Appendix A                        |

## Equations

$$S = S1 \times S2 \times S3 \times S4$$

$$D = (N / 1000)^{0.63} \times S$$

## Calculations

The minimum distance from a rural residence is:

$$(30,000 / 1000)^{0.63} \times 20 \times 1.0 \times 1.2 \times 1.0 = 205 \text{ m}$$

## Two farms considered as one

For calculating the separation distance to a receptor, the 2 farms can be considered as one single farm if they are closer than half the shortest separation distance from each farm to the receptor.

For example, if 2 farms have individual separation distances of 400 m and 600 m from a receptor, they will be assumed to be one farm for the purpose of calculating separation distances if they are closer than 200 m from one another. If the farms are further apart than 200 m, they will be treated as separate farms.

Appendix A of the *Egg Industry Environmental Guidelines* (Australian Eggs 2018) also provides discussion around whether further assessment might be required to account for cumulative impacts if farms are close together.

## Two farms considered separately

Where the 2 farms are considered as separate entities, a 20% increase in separation distance may apply to the proposed second farm. For each farm:

1. add 20% to the required separation distance
2. consider this distance as the radius of a 'separation zone'
3. determine whether the 2 zones overlap.

If the zones overlap, the added 20% applies to the separation distance of the second farm. If the zones do not overlap, the 'normal' separation distance applies and the separation distance of the existing farm is not affected for its current level of operation.

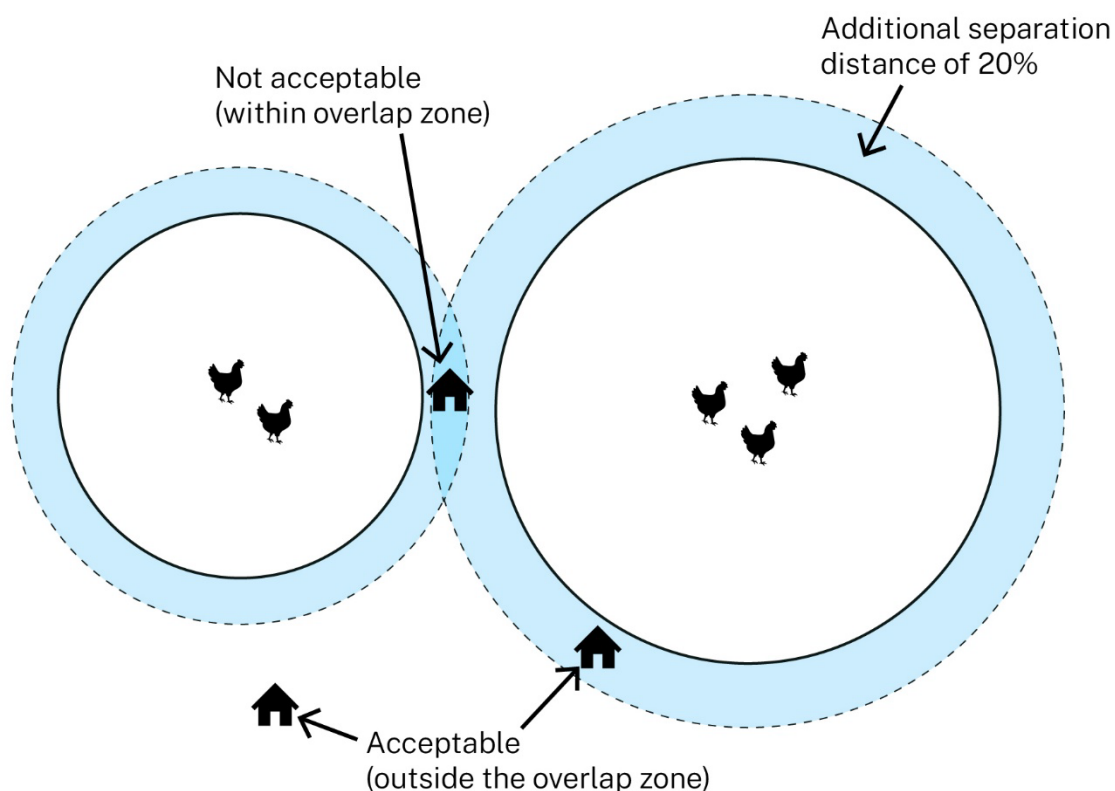
Figure 3 is a visual representation of this method.

As noted previously, this is a simple screening method to understand if impacts on local receptors may occur. The screening assessment should present all the information used to calculate the separation distances as well as justification for all inputs.

The screening methodology is by nature conservative. Therefore, where sensitive receptors are sufficiently removed so as to fall outside the calculated separation distance, the likelihood of impacts is low and no further odour assessment is needed.

However, when the calculation yields a distance that does not satisfy the existing environment and receptors fall within this zone, dispersion modelling should be completed to refine the assessment further. For requirements and considerations for modelling, see Section 4.3 of this guidance note.

Each assessment should be site-specific and determined on a case-by-case basis whether it is appropriate to use a separate distance calculation and/or air modelling.



**Figure 3 Separation distance when 2 farms are considered separately**

## 3.2 Managing odour

Measures that can be adopted to manage odour in egg production that may be incorporated within consent conditions at the site development planning and approval stage include:

- preventing excessive moisture build-up in the manure and the floor litter because when moisture content is >50% (wet basis) significant odour generation begins (Table 1). This has to be balanced against maintaining suitable temperature and humidity for the birds. Excessive moisture can be caused by:
  - unsuitable bedding material (litter)
  - rainfall entering the shed due to lack of maintenance
  - water spillage from drinkers
  - the use of foggers or from condensate from evaporative coolers
  - insufficient replacement of wet bedding at the end of a batch
- ensuring sheds are well maintained and do not leak
- keeping collected manure dry before spreading on land, composting or transferring off site. Store manure in piles to maximise pile drainage; storage should be covered wherever possible. Locate away from sensitive receptors and prevent stock from accessing piles. A compacted base and bunding should be used to reduce run-off in sensitive locations near waterbodies. A sediment fence could also be used. The NSW Department of Primary Industries recommends keeping piles to 1.2 m high and 2.4 m wide to achieve temperatures of 60–70°C to reduce overheating and risk of fires

**Table 1 Litter description according to moisture content**

| Litter description            | Moisture content (% wet basis) |
|-------------------------------|--------------------------------|
| Dusty                         | <15                            |
| Dry to friable                | 15–20                          |
| Friable to moist              | 20–30                          |
| Sticky – beginning to cake    | 30–40                          |
| Wet and sticky – heavy caking | 40–50                          |
| Very wet and sticky           | >50                            |

- moving manure and litter piles, or recovering solids from them, during conditions that favour dispersion such as during sunny periods and when moderate winds are blowing away from nearby receptors; clearing during early morning, evening or night should be avoided. Anaerobic conditions in the piles mean that odorous gases are likely to be released when they are moved; movement and disturbance of piles should be kept to a minimum to minimise odour impacts
- using manure and waste litter soon after it has been collected; that is, spreading it on land or composting it as soon as possible rather than leaving it in stockpiles
- avoiding the spreading of manure and / or waste litter near sensitive receptors (residents) and waterways and during periods of high winds when odours can be transported off site. Review the current orders and exemptions with regard to the reuse of this material prior to reuse via application to land, to ensure conditions are met
- observing the following measures when spreading dried or treated waste solids (litter and manure) on land:
  - apply only when the soil surface is dry
  - apply during weather conditions when dispersion is good and the wind is blowing away from sensitive receptors (when possible)
  - use treated (composted) material rather than material straight from production
  - apply at a rate and in a manner such that minimal material remains on the soil surface after application
  - incorporate material into the soil immediately after application
  - keep neighbours informed about when short-term application will occur
- covering the load when manure or waste litter are transported off site
- making sure composting systems are designed and operated according to recognised principles to minimise odour, especially during windrow turning (see the Local Government Air Quality Toolkit – Module 3, *Air pollution control techniques*)
- burial may require development consent or other regulatory approval. The operator should seek advice from the local council or EPA before considering on-site burial. If burying carcasses on site, an operator should:
  - use deep trenches that are well removed (at least 2 m) from groundwater and protected from surface water infiltration

- cover each placement of dead birds with a 0.3 m layer of soil or odour absorbing material (e.g. sawdust); the depth of this cover can be reduced to 0.15 m when the next layer of birds is added, with the top-most layer covered with a minimum 0.3 m layer
- cover filled pits with a domed layer of impermeable material
- taking extra care when changing the rations fed to birds because in some circumstances this can result in significant changes in their excretions, with the litter becoming very moist and more odorous; avoiding certain feeds or sudden changes can sometimes alleviate the intensity of odour (see the Local Government Air Quality Toolkit – Module 3, *Air pollution control techniques*)
- where natural ventilation is to be replaced by fully enclosed forced ventilation, wherever possible situating the exhaust end of the shed furthest from sensitive neighbours to maximise the separation distance
- for forced ventilation sheds there may also be opportunity to design the outlet to optimise dispersion (i.e. using a vertical stack). Improving vertical momentum of the plume will enhance dispersion, reducing odour concentrations more effectively. This can be done using windbreak walls at the end of the shed to force the exiting air upwards (Figure 4).



**Figure 4** Example of a windbreak wall at the end of a chicken shed  
Source: Jane Barnett/Zephyr Environmental

Regarding composting, the size of the operation and type of waste will determine whether the scheduled activity of ‘composting’ under the POEO Act is being carried out at the facility or whether a non-scheduled activity is being carried out, and therefore who the ARA is. This is detailed in Chapter 4 of this guidance note.



### 3.3 Managing dust

The main method for managing dust emissions is to separate the source of the dust as far as possible from sensitive receptors. The same management principles apply for both odour and dust.

Wherever possible, activities such as cleaning sheds, moving waste materials (manure, litter, etc.) or spreading wastes on land should not be carried out during strong wind conditions because this would enhance dust generation and transport.

Some additional measures for dust control that may be included within consent conditions are:

- erecting wind breaks, wind barriers or vegetation screens in locations where dusty materials are stored; key locations are around manure, compost and waste litter storage
- locating storage areas for dusty materials as far away as possible from sensitive neighbours
- scheduling the movement of dusty materials during the day whenever possible
- applying water sprays to unsealed roads and other dusty surfaces to reduce dust raised by vehicle movement. However, water sprays should not be used extensively on stockpiles of stored manure because of the risk of generating odour
- if dust emissions are a problem when cleaning out shed litter, applying water to the litter beforehand could help – but extra moisture could also lead to an increase in odour
- for forced ventilation sheds, improving vertical momentum of the plume will enhance dispersion and reduce particulate concentrations more effectively. This can be done using windbreak walls at the end of the shed to force the exiting air upwards (Figure 4).

Dust is likely to be a minor issue relative to odour, and dust sources can be relatively well managed. Mitigation measures should be incorporated into assessments for new facilities but it is unlikely modelling would be required.

## 4. Considerations for local councils

### 4.1 Scheduled or non-scheduled activity

As discussed previously, an activity carried out at a facility is designated as scheduled or non-scheduled in the POEO Act depending on its size and the processes being undertaken at the site.

If the activity is a scheduled activity, the EPA is the ARA for the purposes of the POEO Act. Schedule 1, Part 1 of the POEO Act provides a definition for the scheduled activity of *Livestock intensive activities* and specifically *bird accommodation*.

#### Clause 22 Livestock intensive activities

1. This clause applies to the following activities —  
**bird accommodation**, meaning the accommodation of birds for commercial production
2. Each activity referred to in Column 1 of the Table to this clause is declared to be a scheduled activity if it meets the criteria set out in Column 2 of that Table.

| Column 1<br>Activity | Column 2<br>Criteria  |
|----------------------|---|
| bird accommodation   | capacity to accommodate more than 250,000 birds at any time |

If the activity being carried out at a facility is a non-scheduled activity, the local council is the ARA and can also direct the operators to ensure the activity is carried on in an environmentally satisfactory manner and is operating under best practice.

Existing problems can be addressed using 2 sets of regulatory tools:

- orders requiring compliance with consent conditions under Division 9.3 and Schedule 5 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act)
- environment protection notices under Chapter 4 of the POEO Act (see the Local Government Air Quality Toolkit – Module 2 and Module 4), including:
  - a prevention notice (Part 4.3) or series of notices, where the ARA suspects the activity is being carried out in an environmentally unsatisfactory manner
  - a clean-up notice (Part 4.2), where there is a pollution incident within the meaning of the POEO Act
  - both a prevention notice and a clean-up notice.

Under the POEO Act notice provisions, local councils are empowered to direct a recipient to take clean-up action or preventative action, for example, requiring studies to be carried out by the operation's management. Time spent making sure the brief for any investigation is thorough, and covers all the relevant aspects raised in this guideline, is time well spent – for the management, for the local council and for the neighbours and wider community.

If issues are identified, the following tools are available in the Local Government Air Quality Toolkit – *Resource pack*:

- Chapter 3 – checklists for investigating odour, fallout (dust deposition) or other complaints
- Chapter 6 – checklists for reviewing air quality assessments and dispersion modelling.

## Composting and the POEO Act Schedule 1

Composting on site is permitted, providing there is development consent for this activity and relevant guidelines, protocols and legislation are complied with; for example, responsibilities under biosecurity legislation are met and composting ensures adequate pasteurisation to manage pathogen and weed risks.

Compost generated exclusively from on-site organics does not trigger the licensing thresholds for the scheduled activity of ‘composting’ under clause 12 of Schedule 1 of the POEO Act. This includes disposal of carcasses generated exclusively on site via alternative methods not captured under Schedule 1, such as pit burial.

Receipt of carcasses from off site for burial, composting or similar that are above prescribed thresholds would trigger licensing requirements.

Licensing requirements for composting are only triggered when the organic materials are received from off site and are above the thresholds set out in Schedule 1 of the POEO Act.

The composting thresholds may vary depending on the location of the receiving site and whether the organics received are classified as putrescible or non-putrescible. For further details please refer to clause 12 of Schedule 1 of the POEO Act (excerpt below) and clause 50 of Schedule 1 of the POEO Act for definitions of the terms ‘organics’ (including ‘putrescible organics’ and ‘non-putrescible organics’) and ‘regulated area’.

### Schedule 1, Part 1, clause 12 – Composting

1. This clause applies to composting, meaning the aerobic or anaerobic biological conversion of organics into humus-like products –
  - a. by methods such as bioconversion, biodigestion or vermiculture, or
  - b. by size reduction of organics by shredding, chipping, mulching or grinding.
2. The activity to which this clause applies is declared to be a scheduled activity if –
  - a. where it takes place inside the regulated area, or takes place outside the regulated area but receives organics from inside the regulated area (whether or not it also receives organics from outside the regulated area) –
    - i. it has on site at any time more than 200 tonnes of organics received from off site, or
    - ii. it receives from off site more than 5,000 tonnes per year of non-putrescible organics or more than 200 tonnes per year of putrescible organics, or
  - b. where it takes place outside the regulated area and does not receive organics from inside the regulated area –
    - i. it has on site at any time more than 2,000 tonnes of organics received from off site, or
    - ii. it receives from off site more than 5,000 tonnes per year of non-putrescible organics or more than 200 tonnes per year of putrescible organics.

3. For the purposes of this clause, 1 cubic metre of organics is taken to weigh 0.5 tonnes.

Consideration should be given to existing non-scheduled activities that may be approaching the production limits outlined above.

Composts containing animal carcasses cannot be supplied for use off site (i.e. outside the premises where the compost was generated) unless a site has obtained a specific resource recovery order and resource recovery exemption from the EPA that covers that particular waste type. The EPA's order for compost (the compost order; EPA 2016) defines compost as any combination of mulch, garden organics, food waste, manure and paunch that has undergone composting. It was not developed for composting carcasses and does not apply to composting dead stock or animal parts.

'Paunch' is defined in the compost order as the undigested food contained in the stomach of ruminant animals. This is generally considered to include partially digested grass, hay and other feed products such as grain.

Any person proposing to produce/supply compost should give careful consideration to the intended use and all relevant regulatory requirements before determining whether to include animal parts or carcasses in the process.

While carcasses are not an allowed input under the existing compost order, a specific order and exemption can be sought by making a submission to the EPA under the Resource Recovery Framework. Supporting evidence is needed to show that the final compost generated is beneficial or fit for purpose and poses minimal risk of harm to the environment and human health. Information on applying for a specific exemption is available on the EPA's *Apply for an order and exemption* webpage (EPA 2018).

## 4.2 Compliance testing

The need for compliance testing should be considered in each situation, balancing potential expense incurred by the operator against likely sensitivity and the extent of likely impact.

Typical compliance testing conditions are included in Chapter 7 of the Local Government Air Quality Toolkit – *Resource pack*.

## 4.3 Assessment and dispersion modelling

There are a few important aspects for local government to consider when reviewing external consultants' air quality assessment and dispersion modelling studies, to make sure the best outcome is achieved. These are included in Chapter 6 of the Local Government Air Quality Toolkit – *Resource pack*.

It should also be noted that dispersion modelling only applies to projects during the development and approvals stage. Once a facility is operational, odour surveys can be a more useful tool for evaluating odour impacts. The methodology for conducting an odour survey is provided in Chapter 3 of the Local Government Air Quality Toolkit – *Resource pack*.

## 4.4 Operational and control recommendations

If the local council is the ARA for the purposes of the POEO Act, consideration should be given to appropriate operational procedures to control and limit air emissions.

Chapter 7 of the Local Government Air Quality Toolkit – *Resource pack* lists operational measures that are helpful in reducing air emissions and impacts from egg production, as well as any relevant requirements under the POEO (Clean Air) Regulation.

Sections 3.2 and 3.3 of this guidance note indicate a number of odour and dust mitigation considerations that could be included in consent conditions. In addition, where odour is considered to be a significant air quality issue, an Odour Management Plan may be required as a consent condition to ensure the operator is aware of the odour sources and what measures they should have in place to mitigate these.

The local council may need to conduct a site inspection to investigate current management practices. Chapter 2 of the Local Government Air Quality Toolkit – *Resource pack* provides helpful information for council officers prior to these inspections, including a checklist.

Before going on site for an inspection, council officers should be aware of whether scheduled or non-scheduled activities are being carried out at the premises and should review any previous reports (including diagrams, photographs and maps).



## Case study – Spreading of chicken litter

Note that this case study is for illustrative purposes only. It does not indicate a procedure that ARAs, authorised officers and enforcement officers should follow in all cases and does not constitute legal advice. Readers should seek their own legal advice in relation to their specific circumstances.

**Issue:** A farmer has placed a large pile of chicken litter within 50 m of an adjoining residential premises. The adjoining property owners have complained about the odour and have questioned why the litter could not be placed further away from their house. The farmer does not want to move the pile, claiming their truck gets stuck if they drive further onto the property. The litter has been on the property for a few weeks and the farmer is only spreading a small amount at a time, which is resulting in the pile being frequently disturbed, and a regular source of odour nuisance for the neighbour.



**Figure 5** Example of a chicken litter pile

Source: Emily Nicolson/Mid-Coast Council

**Response:** The council officers responded with several steps:

1. A letter was sent to the farmer explaining the complaint and advising that they may be conducting their activities in an 'environmentally unsatisfactory manner', as defined in s 95 the POEO Act.
2. An authorised council officer inspected the site under the provisions of the POEO Act. This investigation included, among other things, an odour survey by the council officer during a period when litter was being spread.

3. The complainant was sent an odour diary template to be completed to support their claim.
4. The diary was returned with notes indicating that whenever litter spreading occurred in conjunction with winds blowing towards the residence, strong odour was experienced at the property.
5. The council officer's site inspection determined that:
  - a. the litter pile was approximately 30 m from the adjoining residential property boundary, and 50 m from the house
  - b. the litter pile had been in place for an extended period and would be disturbed periodically when litter spreading takes place
  - c. there was no apparent consideration by the farmer concerning wind conditions during litter spreading
  - d. there were alternative locations for litter stockpiles that could be considered by the farmer
  - e. the farmer did not want to use alternative locations as they were further from the land application areas and could be difficult to get to after heavy rains.
6. Evidence (from the resident and the council investigation) therefore supported that the activity was carried on in an 'environmentally unsatisfactory manner' (as defined in s 95 of the POEO Act).
7. A prevention notice was issued under s 96(2) of the POEO Act on this basis.

**Mitigation:** The prevention notice directions required the farmer to implement mitigation measures:

1. Find an alternative stockpile location well removed from the neighbour.
2. Adhere to a litter spreading plan that allowed for larger applications each time and therefore less frequent disturbance of the pile.
3. Carry out litter spreading only when the nearest neighbours are upwind of the application areas.

**Outcome:** The farmer was reluctant to make any changes until they were issued with the prevention notice. However, once this had occurred, they were able to find solutions that both reduced odour at the neighbouring property and improved the performance of their farm.

## 5. References and other resources

All documents and webpages that are part of the Local Government Air Quality Toolkit are available from the EPA website.

Australian Eggs (2018) *Egg Industry Environmental Guidelines*, Australian Eggs Ltd, North Sydney NSW, [www.australianeggs.org.au/what-we-do/leading-research/egg-industry-environmental-guidelines](http://www.australianeggs.org.au/what-we-do/leading-research/egg-industry-environmental-guidelines).

Australian Eggs (2023) *Environmental Sustainability*, Australian Eggs Ltd, North Sydney NSW, [www.australianeggs.org.au/what-we-do/leading-research/category/environmental-sustainability](http://www.australianeggs.org.au/what-we-do/leading-research/category/environmental-sustainability).

DAFF (Department of Agriculture, Fisheries and Forestry) (2022) *Australian Animal Welfare Standards and Guidelines for Poultry*, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra ACT, [www.agriculture.gov.au/agriculture-land/animal/welfare/standards-guidelines/poultry](http://www.agriculture.gov.au/agriculture-land/animal/welfare/standards-guidelines/poultry).

DEC (Department of Environment and Conservation) (2006a) *Technical Framework: Assessment and management of odour from stationary sources in NSW*, NSW Department of Environment and Conservation, Sydney South NSW, [www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060440framework.pdf](http://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060440framework.pdf) [PDF 259 KB].

DEC (2006b) *Technical Notes: Assessment and management of odour from stationary sources in NSW*, NSW Department of Environment and Conservation, Sydney South NSW, [www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060441notes.pdf](http://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/20060441notes.pdf) [PDF 254 KB].

DPI (Department of Primary Industries) (n.d.) *Egg production systems in Australia*, NSW Department of Primary Industries, [www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/poultry-planning-and-keeping/poultry-keeping-environment/egg-production-systems](http://www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/poultry-planning-and-keeping/poultry-keeping-environment/egg-production-systems).

DPI (2011) *Best practice guidelines for using poultry litter on pastures*, NSW Department of Primary Industries, [www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0004/140359/Best-practice-guidelines-for-using-poultry-litter-on-pastures.pdf](http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0004/140359/Best-practice-guidelines-for-using-poultry-litter-on-pastures.pdf) [PDF 248 KB].

DPIRD (Department of Primary Industries and Regional Development) (2018) *Newcastle disease – information for commercial poultry producers*, WA Department of Primary Industries and Regional Development, South Perth WA, [www.agric.wa.gov.au/livestock-biosecurity/newcastle-disease-information-commercial-poultry-producers](http://www.agric.wa.gov.au/livestock-biosecurity/newcastle-disease-information-commercial-poultry-producers).

EPA (Environment Protection Authority) (2016) *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014: The compost order 2016*, NSW Environment Protection Authority, Parramatta NSW, [www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastegrants/rro16-compost.pdf](http://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wastegrants/rro16-compost.pdf) [PDF 128 KB]

EPA (2018) *Apply for an order and exemption*, NSW Environment Protection Authority, Parramatta NSW, [www.epa.nsw.gov.au/your-environment/recycling-and-reuse/resource-recovery-framework/apply-for-an-order-and-exemption](http://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/resource-recovery-framework/apply-for-an-order-and-exemption).

Poultry Hub Australia (2024) *Odour emissions*, Poultry Hub Australia, Armidale NSW, [www.poultryhub.org/all-about-poultry/husbandry-management/odour-emissions](http://www.poultryhub.org/all-about-poultry/husbandry-management/odour-emissions).