



Local Government Air Quality Toolkit

Meat chicken production guidance note

Information on good design and management practices to
reduce air emissions from meat chicken 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This resource may contain images or names of deceased persons in photographs or historical content.

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Jane Barnett/Zephyr Environmental

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1. Introduction

1.1 Industry overview

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

Meat chicken establishments with 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 and responsible for environment protection for meat chicken farms with the capacity to accommodate fewer than 250,000 birds.

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.

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

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 egg production.

Meat chicken farms are also referred to as broiler chicken farms in this and other documentation.

The intensive meat chicken industry has traditionally been located close to markets and processing plants. Most of the feed mills and processing plants are in metropolitan areas, with the chicken grower sector of the industry concentrated in the rural outskirts of these areas.

With increasing urban expansion into these traditionally rural areas there has been a rise in complaints by neighbouring residents, mainly about odour, dust and noise from the farms.

1.2 Industry structure

As of 2023, New South Wales is the leading poultry producing state, averaging 33% of national production over the past 4 years. The industry is dominated by vertically integrated companies (processors). Each of these companies contributes significant resources to in-house research and development, particularly regarding product development, processing technologies, quality control procedures, packaging, distribution and market research.

Growers have contracts with these large meat chicken processors:

- The grower provides labour, management, shedding, equipment and bedding material.
- The processor provides the day-old chicks, feed, medication, technical advice, chicken pick-up crews and transport.

The industry also includes a small percentage of extensively run (i.e. free-range) meat chicken farms. The extensive system of chicken production is based on the practice of allowing the bird access to foraging areas outside the chicken sheds.

This guidance note applies to intensive meat chicken / broiler farms only.

Breeding farms

Breeding farms produce fertile eggs that produce the chickens for commercial meat production. Day-old chicks from grandparent stock are reared to laying age and then mated to produce hatching eggs for commercial meat chicken production.

The birds that produce the meat 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. The grandparent and parent stock are productive for about 12 months. At the end of their productive life, these birds are removed for meat processing. The litter is cleaned from the sheds at the end of each cycle and the process starts again.

Hatcheries

Eggs from parent stock are incubated at hatcheries until they hatch. The chickens produced are graded for quality and sex, vaccinated, then consigned to meat chicken farms within hours of hatching.

Meat chicken farms

Batches of day-old chicks are delivered to farms. Here they are raised within large sheds, naturally or mechanically ventilated, with some climate control. Usually the day-old chicks are placed in an insulated, hot-air brooding section, which occupies about a third to half of the shed. The floor space is increased over the next 10–14 days until the chicks occupy the entire shed.

The chickens feed on demand from automatic feeders filled from bulk bins or silos. Drinking water is continuously available.

1.3 Meat chicken housing – facility design and structure

The meat chickens are housed on litter, which may consist of sawdust, wood shavings, paper, rice hulls or chopped straw, depending on availability, price and absorbency. The litter layer is generally 50–100 mm thick.

Litter cleaning

Litter may be cleaned out and replaced at the end of each batch of chickens reared (single batch), partially cleaned out after each batch (partial reuse) or cleaned out after several batches (multi-batch). The processor will generally determine the litter clean-out interval, but the aim should be to maintain conditions where the litter is dry and friable. Watson and Wiedemann (2019) provide outcomes of a review of different litter management options. While litter management will be a function of the farm / litter condition, litter is typically replaced after 50 days.

High moisture litter is a common issue that can lead to increased odour emissions and this can be a result of using foggers in heatwave conditions, or water spillage from drinkers. A vigilant approach to identifying and removing wet litter is now a well-accepted tenet of best practice management. More frequent changing of litter between batches also minimises odour impacts.

Size of sheds

Sheds are typically 100–150 m long and 12–20 m wide and house approximately 20,000 to 50,000 birds. Most farms have 3–4 sheds.

Meat chickens are generally raised in batches and when they reach market age they are loaded into crates for transport to processing plants. Generally, part of the flock is processed after about 5 weeks (thin-out), with most of the flock harvested between 6 and 8 weeks of age.

Sheds remain empty for one to 2 weeks after bird harvest for shed clean-out and disinfection between batches. Farms generally raise 5–6 batches of meat chickens per year.

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 meat chicken production are odour and dust. The potential sources of both dust and odour are noted below.

The flow chart in Figure 1 summarises the production process for meat chickens.

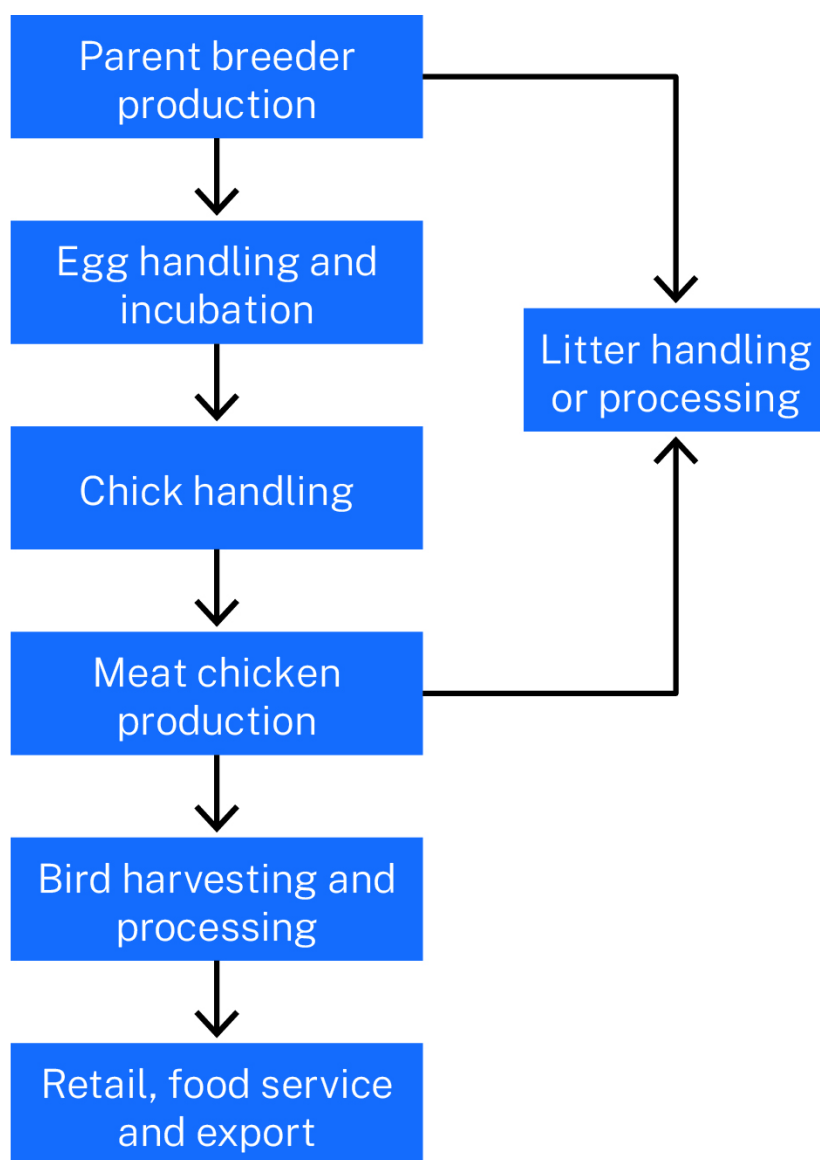


Figure 1 Summary of the meat chicken production process

Figure 2 shows the air quality issues that may occur during each stage of production.

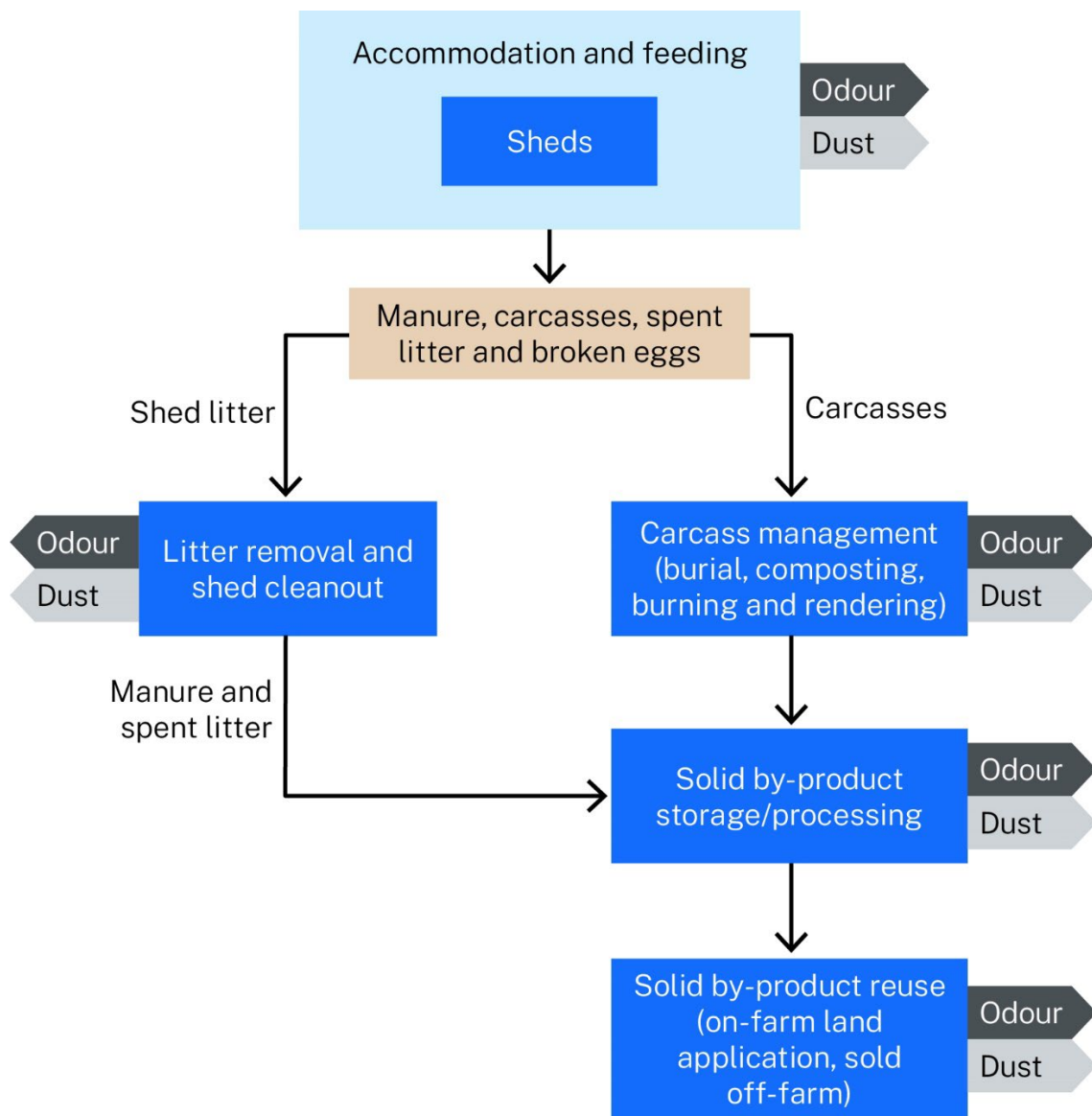


Figure 2 Meat chicken production process with air quality issues for each stage

2.2 Odour

Odour management can be a significant challenge for chicken farms, even for some operated with a view to minimising odour generation.

The farm complex (including sheds and shed litter, range areas, litter management areas, and dead bird management areas) all need to be managed to minimise the potential for odour impacts.

Odour in meat chicken production arises from:

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

2.3 Dust

Dust from meat chicken production arises from:

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

Windblown feathers are also a problem around some meat chicken farms.

3. Managing air pollution

Controls that meat chicken establishments 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 are required through sheds and cages 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 range of mitigation methods and best practice measures that operators can employ to reduce their air emissions and environmental impact.



Figure 3 Example of ventilation outlets at the end of the chicken shed

Source: Jane Barnett/Zephyr Environmental

3.1 Location of broiler farms

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.¹

¹ 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*.

Many existing meat chicken facilities in Australia are in outer-fringe urban areas. 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.²

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.

The *Technical Framework: Assessment and management of odour from stationary sources in NSW* (EPA 2006a) and the accompanying *Technical Notes: Assessment and management of odour from stationary sources in NSW* (EPA 2006b) outline a Level 1, or screening, assessment procedure for large diffuse sources such as meat chicken 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 *Planning and environment guideline for establishing meat chicken farms – Guide 1* (AgriFutures 2021a) describes a similar, but slightly different, industry-specific method. As it is more recent and also specific to the egg industry, it is recommended this method be used in preference to the one in the *Technical Framework*.

It is a 3-tiered approach to determining separation distances:

- Tier 1 – Minimum fixed separation distances
- Tier 2 – Separation distances calculated using an empirical (S-factor) formula
- Tier 3 – Detailed impact assessment using quantitative methodologies such as plume dispersion modelling.

Guide 1 notes that the Tiers 1 and 2 methodologies only apply to farms with a maximum of 600,000 birds. For larger farms, a detailed modelling (Tier 3) assessment should be undertaken. A farm of this size typically means that the operation would be a scheduled activity under the POEO Act (noted in Section 1.1) and is therefore regulated by the EPA and not the local council. As such, only Tiers 1 and 2 methods are described below.

Tier 1 – Fixed separation distances

Individual local councils may specify minimum separation distances between new/expanding farms and sensitive land uses.

Where distances are not specified by state and local government departments and agencies, the following minimum fixed separation distances are suggested:

- 500 m between the odour source and any land-use zone that is not compatible with the development (e.g. residential, rural residential)
- 250 m between the odour source and any sensitive land use (e.g. neighbouring houses) located on land that is compatible with the development (e.g. on land designated rural, farming or similar).

² 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’.

When specifying appropriate separation distances for sheds, the shortest distance between the odour source and the boundary of the sensitive land-use zone must be measured.

The odour source for tunnel-ventilated sheds is taken to be 10 m from the exhaust end of each shed. For naturally ventilated sheds, the odour source is the shed wall nearest to the sensitive land use.

Guide 1 notes that these minimum fixed separation distances should be applied, regardless of the distances calculated under Tier 2 or Tier 3.

Tier 2 – Separation distance formula

An S-factor formula can be used to calculate an appropriate minimum separation distance in all directions suitable for a new or expanding operation, as described in Guide 1 (AgriFutures 2021a). The S-factor formula used in this Tier 2 approach is defined as:

$$D = (N / 1,000)^{0.63} \times S$$

N = Number of birds

S = Composite site factor (S1 x S2 x S3 x S4 x S5 (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
- location / climate factor
- wind frequency factor (optional).

Using this equation can help determine whether the risk of odour impacts is acceptable. If this initial screening assessment determines the site may be at 'high risk' of resulting in odour impacts, further work may be required, such as dispersion modelling, to further clarify the extent of these impacts.

Each of these factors is described in detail in Appendix A of Guide 1 (AgriFutures 2021a), however a worked example is provided below.

Worked example

Scenario: A broiler chicken farm with 100,000 birds, in a relatively flat rural area, with average annual rainfall of about 600 mm and significant tree coverage.

Site data

| S factor | Value | Feature | Reference in Guide 1, Appendix A (AgriFutures 2021a) |
|----------|-------|----------------------------|--|
| S1 | 30 | Rural area | Table 2 |
| S2 | 0.85 | Level wooded country | Table 3 |
| S3 | 1.0 | Flat terrain | Table 4 |
| S4 | 1.0 | Rainfall from 450–1,500 mm | Table 5 |
| S5 | 1.0 | Based on local meteorology | Appendix A |

Equations

$$S = S1 \times S2 \times S3 \times S4 \times S5$$

$$D = (N / 1,000)^{0.63} \times S$$

Calculations

The minimum distance from a rural residence is:

$$D = (100,000 / 1,000)^{0.63} \times 30 \times 0.85 \times 1.0 \times 1.0 = 464 \text{ m}$$

Therefore, if there is a sensitive receptor within 464 m of the meat chicken farm, there is a high risk of odour impacts and potential complaints.

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.

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.

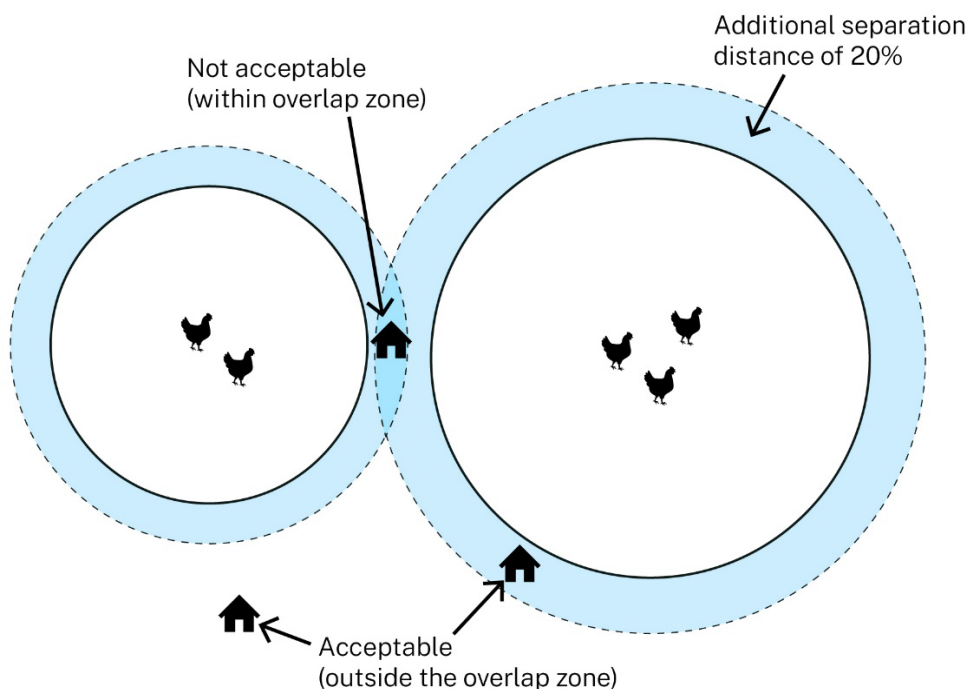


Figure 4 Separation distances when 2 farms are considered separately

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 receptors fall within this zone, dispersion modelling may 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.

3.2 Managing odour

Measures that can be adopted to minimise odour emissions from meat chicken production, and that may be considered as consent conditions at the site development planning and approval stage are:

- preventing excessive moisture build-up in the manure and the floor litter because when moisture content is >50% (wet basis) significant odour generation begins (see 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

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 |

- ensuring sheds are well maintained and do not leak
- keeping collected manure and bedding litter dry before spreading on land, composting or transferring off site
- storing manure in piles to maximise pile drainage; storage should be covered wherever possible and located away from sensitive receptors
- 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

- 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 (see case study in Section 4.4)
- 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. The current orders and exemptions with regard to the reuse of this material should be reviewed 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 loads when manure or waste litter are transported off site
- making sure that 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*)
- observing the following measures when burying carcasses on site:
 - 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 (see Figure 5).

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.



Figure 5 Example of a windbreak wall at the end of a chicken shed

Source: Jane Barnett/Zephyr Environmental

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 incorporated into consent conditions are:

- erecting wind breaks, wind barriers or screens in locations where dusty materials are stored; key locations are around manure, compost and waste litter storage. Low porosity wind barriers can be effective in trapping windborne feathers
- locating dusty material storage areas 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 (see Figure 5).

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 of 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 Activity | Column 2 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 the *Environmental Planning and Assessment Act 1979* (the EP&A Act)
- environment protection notices under Chapter 4 of the POEO Act (see 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 clean-up notice.

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.

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.

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 below.

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) 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 and consent conditions 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 emissions and impacts from meat chicken production.

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.

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 6 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.

ACMF (Australian Chicken Meat Federation) (2020) *National farm biosecurity manual for chicken growers*, Australian Chicken Meat Federation Inc., North Sydney NSW, www.farmbiosecurity.com.au/wp-content/uploads/2020/05/National-Farm-Biosecurity-Manual-for-Chicken-Growers_May2020.pdf [PDF 2.3 MB]

AgriFutures (2021a) *Planning and environment guideline for establishing meat chicken farms, Guide 1 – Assessment guide*, AgriFutures Australia, Wagga Wagga NSW, agrifutures.com.au/wp-content/uploads/2021/12/21-080.pdf [PDF 11.6 MB].

AgriFutures (2021b) *Planning and environment guideline for establishing meat chicken farms, Guide 2 – Applicant guide*, AgriFutures Australia, Wagga Wagga NSW, agrifutures.com.au/wp-content/uploads/2021/12/21-162_singlepage.pdf [PDF 3.9 MB].

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.

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 [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 [PDF 254 KB].

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 [PDF 248 KB].

DPI (2012a) *Best practice management for meat chicken production in NSW: Manual 1 – Site selection & development*, NSW Department of Primary Industries, www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/poultry-planning-and-keeping/planning-for-poultry-development/bpm.

DPI (2012b) *Best practice management for meat chicken production in NSW: Manual 2 – Meat chicken growing management*, NSW Department of Primary Industries, www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/poultry-planning-and-keeping/planning-for-poultry-development/bpm.

DPI VIC (Department of Primary Industries Victoria) (2009) *Victorian Code for Broiler Farms 2009*, Department of Primary Industries Victoria, Melbourne VIC, agriculture.vic.gov.au/_data/assets/pdf_file/0006/530790/VIC-broiler-code-2009.pdf [PDF 4.8 MB].

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/rr016-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.

Industry & Investment NSW (2011) *Better site selection for meat poultry developments*, NSW Department of Industry and Investment, www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/poultry-planning-and-keeping/planning-for-poultry-development/better-site-selection.

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

RIRDC (Rural Industries Research and Development Corporation) (2009) *Control of Odour and Dust from Chicken Sheds: Review of 'add-on' technologies*, Rural Industries Research and Development Corporation, Barton ACT, agrifutures.com.au/wp-content/uploads/publications/09-034.pdf [PDF 1.8 MB].

Watson K and Wiedemann SG (2019) *Review of fresh litter supply, management and spent litter utilisation*, AgriFutures Australia, Wagga Wagga NSW,