

**Industry Sector:  
Livestock Processing Industries  
(Animal Slaughter and Rendering)  
September 2003**

**Compliance Performance Report**



ENVIRONMENT PROTECTION AUTHORITY

This *Compliance Performance Report—Industry Sector: Livestock Processing Industries* was prepared by the Compliance Audit Section, NSW Environment Protection Authority.

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ISBN 1 74137 004 3  
EPA 2003/77  
September 2003  
Printed on recycled paper

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# EXECUTIVE SUMMARY

As part of its industry sector-based Compliance Audit Program, the Environment Protection Authority (EPA) conducted compliance audits at 19 licensed livestock processing industry facilities across NSW. The audit objectives were to:

- assess each enterprise's compliance with the statutory instruments issued to the premises and with legislation administered by the EPA
- outline a program of follow-up actions needed to address non-compliances and improve environmental performance.

This report is a collation of these findings. It provides an insight into the industry sector's overall compliance and a summary of other issues of environmental concern identified through 'further observations' during audits. The EPA is carrying out a systematic and rigorous process regarding follow-up actions to ensure that licensees of audited sites address all reported non-compliances. Follow-up actions required for audited sites can be found in the individual audit reports, available in the EPA library—phone (02) 9995 5302.

The procedures and protocols for conducting each audit in the sector are described in the *EPA Compliance Audit Handbook* (EPA 1997). Compliance at each premises was assessed by a detailed site inspection and a review of records and documentation. Officers of the EPA carried out the audits between September 2001 and August 2002.

The facilities included eleven animal slaughtering facilities, two rendering/fat extraction (rendering) facilities and six facilities that conducted both activities. A total of 52 premises are licensed to conduct animal slaughter and 34 are licensed to conduct rendering in NSW. It is therefore likely that the issues in this report are generally typical of those in the animal slaughtering and rendering components of the livestock processing facilities sector.

Based on the audits, the key areas where the industry could improve its compliance and environmental performance include:

- air pollution—by improving odour controls
- water pollution—by improving effluent management and the storage of materials
- monitoring—by improving effluent, soil, surface water and groundwater monitoring
- accountability—by notifying the public of the company's complaints line.

The EPA has worked with individual licensees to improve environmental performance. The Compliance Performance Report looks at ways environmental performance can be improved across the industry.

While the EPA ensures that issues are being addressed at the audited sites, they are likely to be of concern at any premises where animal slaughtering and rendering are undertaken and warrant an ongoing focus by all site managers. The EPA will continue to work with licensees and will ensure that issues are also being addressed at premises that were not audited.

The EPA will also use the findings of this report to review how its resources could best be channelled to guide industry overall in addressing the issues in this report. The EPA will consider using regulatory tools such as licence conditions and enforcement as well as policy documents, education, consultation and negotiation.

It is also hoped that the report will help the livestock processing industry understand and manage the environmental risk of operating animal slaughtering and rendering facilities.

## **Key issues from the audits**

### **Air pollution**

#### **Odour controls**

- There were odours from effluent treatment ponds and irrigation areas due to inadequate levels of effluent treatment.
- There were potential odours from rendering plants due to inadequate maintenance of ducting designed to capture vapours from cookers.

### **Water pollution**

#### **Effluent management**

- There were inadequate controls to minimise manure being flushed from stockyards to effluent treatment ponds which had insufficient capacity to deal with the effluent load.
- There were inadequate controls to prevent chemicals and uncontaminated stormwater entering the effluent treatment ponds, which could compromise the ponds' effectiveness.
- Sludge built up excessively in treatment ponds, limiting the ponds' capacity to adequately treat the effluent.
- The volume of effluent irrigated exceeded the capacity of the area to assimilate the hydraulic loading.
- Irrigation areas were inadequately managed due to limited soil sampling, understanding of nutrient budgets, agronomist assessments and action plans to address emerging issues.
- There was potential for groundwater to be contaminated by leakage from effluent treatment ponds.
- There was potential for runoff from irrigation areas due to inadequate wet weather storage.

#### **Solid organic and general waste management**

- Organic material collected by effluent pre-treatment devices was inadequately disposed of.
- Manure from stockyards was permitted to accumulate or was placed in an area from where it could be flushed to stormwater.
- Large quantities of building materials and disused batteries were inappropriately stored—this could cause pollution of waters and soil contamination.

#### **Materials storage**

- Materials were stored in areas from where they were likely to be flushed to stormwater.
- There was inadequate bunding of chemical containers, partially full drums and fuel storage tanks which could potentially cause pollution of waters and soil contamination.

#### **Miscellaneous**

- Surface water pollution due to poor housekeeping allowed material to build up in areas which drained to the stormwater system.

#### **Pollution of water**

- Effluent was irrigated onto an area from which it was flushed by stormwater.
- There were inadequate controls to prevent contaminated water from stockyards flowing off-site.

### **Monitoring**

#### **Effluent volume and concentration**

- The volume and concentration of effluent being irrigated was inadequately monitored, limiting the proper and efficient management of the irrigation area.
- Samples were taken at a point other than that specified on the licence, meaning they may not have been representative.
- All parameters required by the licence were not analysed.
- Parameters were not analysed in accordance with EPA approved methods.

#### **Irrigation and solid waste disposal area**

- Sampling was not conducted at the required frequency.
- The lack of soil sampling and inadequate analysis of irrigation and solid waste disposal areas meant the areas were not properly managed.
- Parameters were not analysed in accordance with EPA approved methods.

### **Surface water and groundwater**

- There was inadequate monitoring of groundwater to ensure irrigation practices were not causing pollution.

### **Accountability requirements**

#### **Records of monitoring**

- There were incomplete monitoring records.

#### **Pollution complaints**

- The public were not notified about telephone complaints lines or there were incomplete records of complaints.

## **Key practices observed during EPA audit inspections that contributed to competent environmental management**

### **Air pollution**

#### **Dust controls**

- Trafficable areas were sealed to prevent dust emissions.

#### **Odour controls**

- In certain conditions, anaerobic ponds were covered with plastic to minimise odours.
- Rendering plants had a biofilter and back up afterburner in case the biofilter failed.
- Vapours from the cookers were collected and directed to a biofilter, and the entire rendering plant building was maintained under negative pressure with the airflow discharged through a scrubber to remove any background odours.
- Floors and drains were regularly flushed, cleaned and inspected, preventing the build up of organic material which could contribute to odours.

### **Water pollution**

#### **Effluent management**

- Roofed stockyards prevented contaminated stormwater running off-site and reduced the effluent loading on the treatment system.
- Manure was scraped from the stockyards, rather than being flushed off, which limited the amount of liquid effluent that needed to be treated and irrigated.
- A separate blood drainage system directed any blood that collected on the floor of the process areas to a blood holding tank.
- The blood which collected on the floor of the process areas and the first flush of wash water that was applied to these areas were directed to the blood holding tank before the drains to the blood tanks were plugged, and subsequent wash water drained to the effluent treatment system.
- Parallel anaerobic ponds were used so one pond was operating when the other was taken offline to have accumulated sludge removed.
- Additional capacity, based on local climactic conditions, was incorporated into the treatment pond system designed to contain wastewater during rain, to ensure the hydraulic capacity of irrigation areas was not exceeded.
- Large terminal ponds captured any effluent which could be flushed off the irrigation area.

#### **Solid organic and general waste management**

- Manure was dry scraped from the stockyards and processed in a worm farm.
- Paunch material was removed from the waste stream and taken off-site to be composted in a worm farm.

#### **Miscellaneous**

- At several premises, external areas potentially subject to limited contamination, e.g. truck loading areas, were regularly vacuum swept and drained to a first flush system. This system captured any material flushed from the surface during rain and any spills. Spills were pumped into containers for transport to an appropriate disposal facility and the first flush from rain was directed to the effluent treatment system.

# INTRODUCTION

## Purpose of this report

This report presents the key findings of compliance audits carried out on a representative sample of premises conducting animal slaughtering and rendering/fat extraction (rendering) activities in the livestock processing industries sector. The audits were undertaken through the Industry Sector Compliance Audit Program on premises across NSW that are regulated through statutory instruments issued under environmental legislation the EPA administers.

The EPA expects the industry sector will use this report to:

- identify areas in which it can improve its overall level of compliance
- improve the environmental performance of the industry sector as a whole, and the individual premises within it.

To assist with these actions, the EPA will:

- present the findings of the Industry Sector Compliance Audit Program to relevant stakeholders
- consider issues the audits identified that were prevalent across the industry, with input from relevant stakeholders.

This report has been prepared for the purpose described and no responsibility is accepted for its use in any other context or for any other purpose.

## Selection of industry sector

Industry sectors targeted by the EPA's Industry Sector Compliance Audit Program are chosen on the basis of an assessment of major community and environmental concerns and EPA corporate objectives and strategies.

Individual premises in the industry sector are selected for audit in consultation with EPA regional offices to gain a representative sample.

In NSW, 52 premises are licensed to conduct animal slaughtering and 34 are licensed to conduct rendering. Nineteen licensed premises were audited, including eleven animal slaughtering facilities, two rendering facilities and six facilities that conducted both animal slaughtering and rendering. A description of the audited premises is provided on page 3.

## Audit methodology

EPA compliance audits were performed on the selected premises in accordance with the procedures and protocols in the *EPA Compliance Audit Handbook* (copies of the Handbook are available from the EPA's Pollution Line: phone 131 555). The audits were limited to a review of each enterprise's compliance with legislation administered by, and statutory instruments issued by, the EPA.

When an audit is completed, the findings are presented to the enterprise as an individual compliance audit report. These reports are based on information from the EPA's files, information supplied by representatives of the enterprise and observations made during site inspections, which were carried out between September 2001 and August 2002. The reports contain a plan of action, with recommendations on what must be done by each enterprise to comply within an agreed time period. These recommendations relate to non-compliances and other areas where enterprises can improve their environmental performance.

EPA staff follow-up on compliance audits. The EPA has a systematic and rigorous monitoring program that tracks these follow-ups to ensure the licensee completes all actions.

Individual compliance audit reports are publicly available in the EPA library on Level 15, 59–61 Goulburn Street, Sydney. The findings in this report are a collation of the findings in the individual compliance audit reports.

## Description of industry sector

Livestock processing industries include animal slaughtering, rendering or fat extraction, tanning or fellmongery, wool scouring and other activities that produce animal products, e.g. adhesives, fertilisers, pet food.

### Licensed activity

Premises conducting activities that are both listed in Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act) and are conducted above the identified thresholds are required to hold a licence with and are regulated by the EPA. Industrial and commercial premises conducting non scheduled activities are generally regulated by the local council.

‘Livestock processing industries’ is a class in Schedule 1 of the POEO Act and is outlined as follows.

*Livestock processing industries comprising commercial operations that:*

- (1) **slaughter animals** (including poultry) with an intended processing capacity of more than **3,000 kilograms live weight per day**, or
- (2) *manufacture products derived from the slaughter of animals including:*
  - a. *tanneries or fellmongeries, or*
  - b. **rendering or fat extraction plants** with an intended production capacity of more than **200 tonnes per year** or their derivatives or proteinaceous matter, or
  - c. *plants with an intended production capacity of more than 5,000 tonnes per year of products including hides, adhesives, pet food, gelatine, fertiliser or meat products, or*
- (3) *scour, top or carbonise greasy wool or fleeces with an intended production capacity of more than 200 tonnes per year.*

Table 1 provides the number of premises licensed for each livestock processing industry activity.



**Table 1: Number of licensed premises for each type of scheduled activity (December 2002)**

Scheduled activity	No. of licensed premises				
	All licences	Total no. licensed to carry out slaughter and rendering	No. licensed to carry out slaughter	No. licensed to carry out rendering	No. licensed to carry out slaughter and rendering
(1) Slaughter	27	61	52	34	25
(1) Slaughter and (2b) Rendering	19				
(1) Slaughter, (2b) Rendering and (2a) Tanning	1				
(1) Slaughter, (2b) Rendering and (2c) Other	4				
(1) Slaughter, (2b) Rendering, (2a) Tanning, (3) Scouring and (2c) Other	1				
(2b) Rendering	7				
(2b) Rendering and (2a) Tanning	1				
(2b) Rendering and (2c) Other	1				
(2a) Tanning	6				
(3) Scouring	5				
(2c) Other	15				

Note: 61 premises are licensed by the EPA to conduct animal slaughter and rendering in NSW. Of these, 52 are licensed to conduct animal slaughter, 34 are licensed to conduct rendering and 25 are licensed to conduct both animal slaughter and rendering.

## Description of the audited premises

Nineteen of the 61 premises licensed by the EPA to conduct animal slaughter and rendering in NSW were selected for auditing as a representative sample. Details regarding these premises are:

- the facilities included eleven animal slaughtering facilities, two rendering facilities and six facilities that conducted both animal slaughtering and rendering
- seventeen premises were audited that conducted animal slaughtering and eight that conducted rendering
- three of the seventeen facilities that conducted animal slaughtering processed poultry only
- the three poultry processing premises and one of the facilities that conducted both animal slaughter and rendering discharged treated effluent to the sewer
- one of the premises that conducted animal slaughter, but not rendering, discharged treated effluent to both the sewer and an irrigation area
- all the other fourteen premises audited discharged treated effluent to an irrigation area.

Details, including licence numbers, of the individual premises audited are listed in Appendix A.

One of the audited premises (Licence No. 2634) also conducted tanning, and although the activities associated with the tanning operation were audited, issues pertaining purely to these activities are not

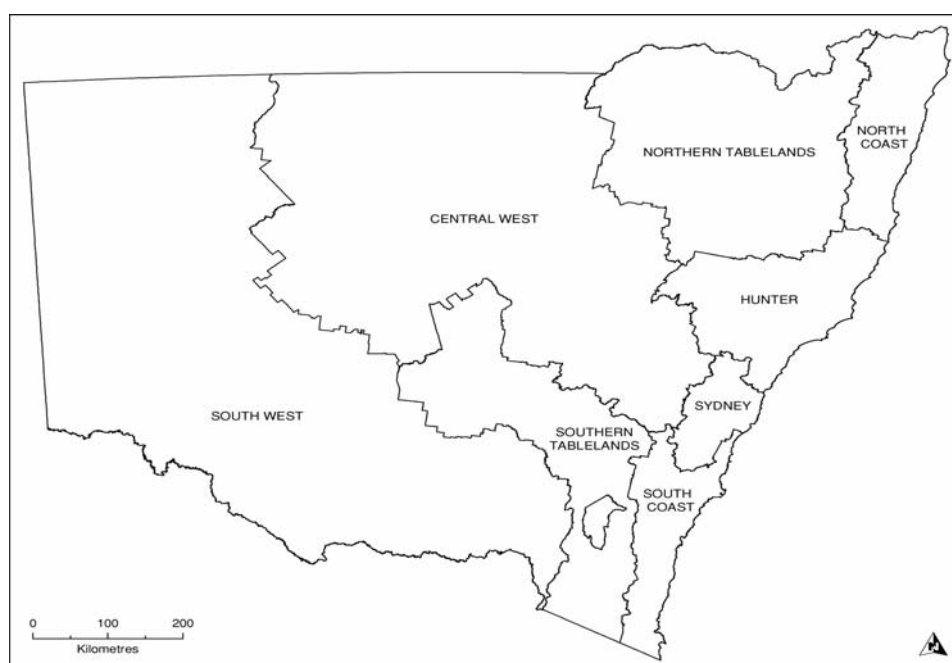
presented in this report. Information regarding these additional activities may be obtained from the individual report.

The scales of operation of the premises audited are listed in Table 2.

**Table 2: Scales of operation of premises audited**

Activity/Unit	Scale of facility	Licence nos and no of premises audited with this scale on the licence					
		Slaughter		Rendering		Both slaughter and rendering	
		Licence nos	No	Licence nos	No	Licence nos	No
Animal slaughter (Live weight capacity to process per annum in tonnes)	0–30,000 Tonnes	5348, 3903, 2880, 2656, 3102, 3284	6	-	-	3838	1
	> 30,000 Tonnes	5069, 11614, 422, 10815, 1399	5	-	-	1328, 11279, 6032, 341, 2262	5
Rendering (Tonnes produced per annum)	0–4,000 Tonnes	-	-	2634	1		-
	> 4,000 Tonnes	-	-	1100	1	3838, 1328, 11279, 6032, 341, 2262	6

EPA regions are shown in Figure 1. Details of the number of animal slaughtering facilities and rendering facilities licensed in each EPA region, and the number of audits carried out in each region as at December 2002, are shown in Table 3.



**Figure 1—EPA regions**

**Table 3: Number of premises licensed for animal slaughter or rendering audited in each EPA region as at December 2002**

EPA region	Animal slaughter		Rendering		Both slaughter and rendering	
	Number of premises licensed	Number of premises audited	Number of premises licensed	Number of premises audited	Number of premises licensed	Number of premises audited
South Coast	1	1	0	-	2	1
Sydney	9	4	4	1	0	-
Hunter	3	-	1	-	5	1
North Coast	3	1	1	-	3	-
Northern Tablelands	2	1	2	1	2	1
Central West	1	-	1	-	3	1
Southern Tablelands	1	0	0	-	6	1
South West	7	4	0	-	4	1
<b>Total</b>	27	11	9	2	25	6

## Process descriptions and key methods of pollution control

Various systems and processes are used at animal slaughter and rendering plants. A brief overview follows of some systems and processes encountered during the audit inspections and the key methods of pollution control that can be employed at these premises.

### Animal slaughter facility (cattle, sheep and pigs)

#### Description

Stock is delivered by dedicated trucks and received into the stockyards from where it is either processed directly or held for up to several days in the holding yards. The animals enter the facility and either electrical or mechanical means are used to make them unconscious before they are bled. The hides are then removed from the carcasses followed by the internal organs, heads and hooves (offal). The undigested contents from the first stomach (paunch) are also removed. The carcasses may then be sectioned. Either the whole carcass or the sections are stored in cool rooms prior to being transported off-site.

#### Key methods of pollution control

Odours from hides are usually minimised as the hides are generally preserved by salting (e.g. rotated in barrels with salt) or storage in a cool room. Odours from the offal and from the fat and bone discarded during sectioning are minimised by containing this material in covered bins or hoppers and transporting it to an on-site or off-site rendering plant as quickly as possible. As much as is practicable, the blood, which has a high biological oxygen demand (BOD) and salt content, is kept separate from any wash water directed to the effluent treatment system and is directed to a holding tank for storage before being regularly transported to a rendering plant, blood drying plant or land disposal area.

The facility should be cleaned daily which also minimises potential odours. However, the introduction of substances into the wash water which may compromise the effectiveness of the effluent treatment system, such as disinfectants, chlorine, detergents and hot water, should be prevented as much as is practicable. Wash water from the abattoir generally passes through removable sieves located in the floor drains and then through a preliminary treatment system (such as a save-all pit with screens or a rotating screen) to remove gross solids before it is discharged to the effluent treatment system.

Manure that accumulates in the stockyards is often flushed to the effluent treatment system. However, the manure should be dry scraped from the stockyards and applied to land as a fertiliser in appropriate on-site or off-site areas if it could overload the treatment system. Blood, paunch contents and solids collected in

pre-treatment systems may also be spread on an appropriate on-site or off-site land disposal area which is managed so the material is properly incorporated into the soil.

Land disposal should only occur if the disposal area is capable of assimilating the material and when weather conditions are such that any offensive odours which may occur will not impact upon off-site receptors. Foreign matter, such as plastic throat plugs, should also be screened from the material before it is applied. Animals who are not processed, such as those who are dead on arrival at the facility, may be buried in pits on-site. An appropriate soil, groundwater and surface water monitoring program should be in place to ensure the land disposal practices are sustainable in the long term.

## **Animal slaughter facility (poultry)**

### **Description**

To minimise stress during transportation, the live birds are delivered to the plant's live bird receival area during the night before the next day's processing. The birds are kept in this area until processing commences and then transported by forklift in modules and hung on a moving chain for killing and transport through the processing plant. The birds obtain an electric shock and are bled before passing through scold tanks. They are then plucked and gutted and have their heads and feet removed before being cooled by immersion in spin chillers and by movement through an air chill facility. The birds then move into the cut up and packing areas. Following processing the birds are placed in chillers prior to being loaded onto refrigerated trucks for transport off-site.

### **Key methods of pollution control**

Waste products from the processing of birds may be collected from the processing line by mechanical means and separated into three distinct waste streams comprising blood, feathers and internal organs/heads/feet (offal) for collection and regular transport to a rendering plant. As well as regular flush and 'spot' cleaning of the plant during a shift, a full daily cleaning should also occur. All sections of the plant including the live bird area and the wastewater pits and pipes should be cleaned and flushed daily to minimise potential odours. All internal factory areas and contaminated external areas usually drain to wastewater pits and then to the effluent treatment and disposal system.

## **Rendering facility**

### **Description**

Solid material (offal) is generally dumped into a hopper from where it is delivered via a delivery screw to a pre-breaker and then to the cookers. Blood may be processed in the cookers or in a separate drying plant. Cookers may be either batch or continuous. Batch cookers process one load at a time while continuous cookers are loaded at one end and the cooked material is drawn off at the other end. The material is heated to approximately 120°C for several hours. No water is added and the steam that is driven off by the cooking process passes through a condenser and the condensate may be reused in the boiler. The meal is removed from the cookers via a reverse screw and sits in a pan while free tallow runs through a screen. The meal is then augured into a press and further tallow is squeezed out. The tallow is pumped to a centrifuge, which removes very fine meal, before being pumped to storage tanks. Once cooled, the tallow solidifies and generally requires reheating to enable it to be pumped into mobile tankers for transport off-site. Depending on the grade, the tallow can be used for pharmaceuticals, food, soap or stock feed. Once the tallow has been squeezed from the meal, the meal passes through a hammer mill and is either bagged or contained in a bulk tipper for transport off-site, largely for use in the pet food and fertiliser industries.

### **Key methods of pollution control**

To prevent odours emanating from the unprocessed material, it is usually processed as soon as it is delivered. Vapours from the condenser and those collected by hoods over the cookers and presses within the plant should be ducted to an odour treatment system such as a biofilter or afterburner. Continuous cookers generally produce fewer odours than batch cookers. An additional effective means of minimising odours is to maintain the building housing the cookers under negative pressure with the air flow directed through an odour treatment system. Washdown water and spills collected by internal drains are directed to

an effluent treatment system via a save all pit with a screen, and the captured solids are returned to the cookers. Condensate not reused in boilers is also directed to the effluent treatment system.

## **Pond effluent treatment system and irrigation area**

### **Description**

Ponds are the most commonly used wastewater treatment system at both animal slaughtering and rendering plants. A common pond system involves one anaerobic pond followed by one or more aerobic ponds. The anaerobic pond is deep and a crust is encouraged to form on the surface to reduce the interchange of air with the pond surface and reduce offensive odours. Once the crust has formed, fats should be removed from the wastewater stream before it is discharged to the pond. Organic matter in the water is broken down by anaerobic bacteria and solids settle to the bottom. The retention time required in the anaerobic pond is dependent on the biological oxygen demand (BOD) loading in the effluent, although 28 days is generally considered appropriate. The effluent flows from the anaerobic pond into one or more aerobic ponds. Aerobic ponds are shallow to promote the exchange of oxygen, and aerobic bacteria further break down the organic matter. The retention time required in the aerobic ponds depends on the remaining BOD loading.

A facultative pond (a deep stratified pond) may be placed between the anaerobic and aerobic ponds to ensure the BOD loading in the wastewater can then be effectively treated in the aerobic pond. The effluent from the anaerobic pond is introduced into the bottom of the facultative pond for further anaerobic biological action. When the wastewater rises to the top of the facultative pond, drawn off and directed to the aerobic pond, the biological action is aerobic. Other pond systems are only aerobic and, if required and carefully monitored, enzymes may be added to the wastewater stream before it enters the ponds to facilitate the breakdown of organic matter. Treated effluent is pumped from the final aerobic pond to an irrigation area or to the sewer in accordance with a trade waste agreement.

### **Key methods of pollution control**

The ponds must be constructed of material or lined with material that prevents leakage. They should be designed to have sufficient capacity to ensure adequate anaerobic or aerobic treatment occurs. This will ensure a crust forms and is maintained on the anaerobic pond, and minimises the potential for odours from the ponds and excessive nutrient loading on the irrigation area. Any discharge from an anaerobic pond to another pond in the system should be to below the surface of the receiving pond to minimise the emission of odours. Preferably, the maximum quantity of blood and organic solids possible should be removed from the wastewater stream prior to it entering the ponds. This ensures the ponds are not overloaded and prevents an excessive build-up of sludge.

Mechanisms should also be in place to prevent stormwater and chemicals (that may compromise the effectiveness of the treatment system) entering the ponds. After several years, the accumulated sludge must be removed to ensure the required retention time is maintained for the effluent. Appropriate management tools should be used to minimise any odour impacts. These include removing sludge during favourable weather conditions, such as when the wind direction is away from sensitive receptors, and employing covered transport to an appropriate disposal site. Dual pond systems may be in place so that one is kept online while the other is being desludged. Some ponds are allowed to evaporate and dry, and the dried sludge is removed before the pond is recommissioned.

Any irrigation area must be of an adequate size to assimilate the hydraulic, nutrient and salt loadings that are applied. To ensure that the level of nutrients, salt and volumes of water irrigated is sustainable in the long term, the volume and concentration of the effluent should be periodically measured and the results monitored over time. The loads of nutrient removed by cropping or grazing should be fully assessed and appropriate nutrient budgets constructed. Soil sampling and analysis should also be periodically conducted and the results monitored over time to validate nutrient budgets and ensure the loads applied do not exceed the rates of removal by plants or assimilation in soil. Clear action plans should be in place for correcting any imbalances in the nutrient, salt or hydraulic budgets. If necessary, a consultant should be engaged to

review the monitoring results, prepare the nutrient budgets and provide advice on appropriate crops and pastures for the system.

The maximum hydraulic assimilative capacity of the area should be obtained by, for example, installing and maintaining diversion drains upslope of the area to prevent any water from upslope flowing onto the area. Adequate wet weather storage, based on local climatic conditions, should be available to prevent overtopping or uncontrolled discharges from ponds during wet weather and periods of low irrigation demand. Terminal collection ponds should also be provided so any effluent flushed off the area is collected and can be re-irrigated (or recirculated). Where necessary, an appropriate groundwater and surface water monitoring program should be in place to ensure the irrigation practice is not having adverse off-site impacts. All the above elements, including relevant sections of any consultant's report, should be integrated into an overall management plan which is periodically updated.

### **Dissolved air floatation treatment system**

At some poultry processing plants, wastewater may be directed to a compact effluent treatment system such as a dissolved air floatation (DAF) unit to remove grease and solids before it is discharged to the sewer in accordance with a trade waste agreement. Solid waste removed from the effluent by the DAF system may be, for example, transported daily to the local landfill to minimise odours.

### **Statutory instruments issued to the enterprises**

All the premises audited held environment protection licences issued under the *Protection of the Environment Operations Act 1997* (POEO Act). Two of the premises had pollution reduction programs (PRPs) attached to their licences. Both of these had been finalised before the audit inspections. One of the PRPs required an acoustical report to be submitted to the EPA and this had been completed and measures implemented by the company to address a number of the noise sources identified in the report. The other PRP required a farm management plan, designed to ensure the irrigation practices conducted on the premises were sustainable, to be submitted to the EPA and this had also been provided. No statutory notices, for example those requiring information to be provided to the EPA, had been issued to any of the premises audited at the time of the audit inspections.

The POEO Act requires the EPA to review licences every three years. As at May 2003, 12 of the 19 animal slaughter and rendering licences audited had been reviewed.

# SUMMARY OF FINDINGS OF COMPLIANCE AUDITS

The compliance of each premises with environmental legislation administered by the EPA and with conditions attached to the statutory instruments held, is described in the individual compliance audit reports available in the EPA library (see list in Appendix A). This report summarises the areas of environmental concern and the issues that contributed to the *non-compliances* and *further observations* reported in the individual compliance audit reports. *Non-compliances* are reported when there is clear evidence of a breach of licence conditions. *Further observations* are indicators of potential non-compliances or aspects of the operation where environmental performance may be improved. When an issue is observed that does not strictly relate to the scope of the audit or assessment of compliance, the issue is reported as a *further observation*.

The EPA is also carrying out a systematic and rigorous process of follow-up actions to ensure that licensees of audited sites address all *non-compliances* reported. These actions can also be found in the individual audit reports.

In this section of the report the following symbols are used to delineate between findings that have been reported in the individual audit reports as *non-compliances* and those reported as *further observations*:

- *non-compliances*
- *further observations*.

The numbers in brackets at the end of each finding indicate the number of premises for which the particular issue was identified out of the total number of relevant premises audited.

The areas of environmental concern and the issues that contributed to the *non-compliances* and *further observations* identified during the audits are summarised in Table 4. Some areas are interrelated where, for example, air pollution and water pollution are both affected by inadequate waste management. Similarly, specific issues such as inadequate removal of manure from stockyards may create a flow-on effect by creating possible issues with, for example, odour and surface water pollution.

This section also identifies practices that were observed during the audit inspections that contributed to the competent environmental management of some issues.

**Table 4: Issues contributing to non-compliances and further observations identified in the audits**

<b>Category</b>	<b>Issues contributing to non-compliances and further observations</b>	<b>No. of premises at which issue was identified (out of a total of relevant premises audited)</b>
<b>Air pollution</b>		
	Control of dust	2 (19)
	Control of odour	10 (19)
	Control of boiler emissions	2 (19)
	Control of open burning	1 (19)
<b>Water pollution</b>		
	Effluent management—stockyards	3 (14)
	Effluent management—process facility	4 (19)
	Effluent management—treatment	11 (19)
	Effluent management—irrigation area	15 (15)
	Solid waste management—organic material	5 (19)
	Solid waste management—general material	3 (19)
	Materials storage	11 (19)
	Miscellaneous (e.g. general housekeeping)	7 (19)
	Pollution of waters	2 (19)
<b>Hazards &amp; loss of amenity</b>		
	Dust controls	2 (19)
	Odour controls	10 (19)
	Noise controls	1 (19)
<b>Monitoring</b>		
	Effluent volume and concentration monitoring	12 (19)
	Irrigation area soil monitoring	11 (15)
	Surface water and groundwater monitoring	7 (15)
	Weather monitoring	1 (19)
<b>Accountability</b>		
	Provision of information and data to the EPA	1 (19)
	Recording and keeping monitoring records as required	4 (19)
	Notification of the public of complaints line/operating complaints line/keeping records of complaints	10 (19)
	Submission of a complete Annual Return	4 (19)
	Notification of the EPA of an incident contact number	2 (19)

Note: Of the 19 premises audited, 11 conducted animal slaughter only, 2 conducted rendering only and 6 conducted both animal slaughter and rendering. Therefore 17 premises conducted animal slaughter and 8 conducted rendering. Of the 11 premises conducting animal slaughter only, 3 were chicken processors. The 3 chicken processors and the 2 facilities that conducted rendering only did not have stockyards. Therefore the number of premises with stockyards was 14. Four of the premises discharged all their effluent to the sewer, in accordance with a trade waste agreement, and therefore the total number of premises with irrigation areas was 15.



## AIR POLLUTION

Air pollution arising from animal slaughtering and rendering can include offensive odours, dust and smoke emissions that may have impacts on human health and the environment. All operators should identify activities, plant and equipment that could cause air pollution. Operational procedures and process controls that minimise air emissions from the site should be developed and implemented. The effectiveness of these controls should be monitored on an ongoing basis.

The following issues relating to air pollution or potential air pollution were identified.

### Dust control issue

In dry windy conditions, dust may emanate from areas such as stockyards, compacted irrigation areas, unsealed accessways and yard areas.

The following issues relating to dust controls were identified at 2 of the 19 premises audited.

#### Common to both animal slaughtering and rendering

- Wind gusts caused dust emissions from unvegetated and unsealed areas of the site, beyond the boundary of the premises (1 of the 19 premises audited).
- There was potential for dust to be emitted from the premises due to unsealed accessways (1 of the 19 premises audited).

Dust controls should:

- minimise pollutants leaving the site as airborne dust
- reduce sediment pollutant load
- protect local amenity.

The effectiveness of controls should be monitored on an ongoing basis.

**A practice observed during EPA audit inspections that contributed to the competent environmental management of dust**

- Trafficable areas were sealed to prevent dust emissions.

### Odour control issue

The most common cause of complaints for animal processing facilities are those regarding odours affecting the amenity of the neighbouring community. Whether it is stated on the licence or not, section 129 of the POEO Act prohibits the emission of offensive odours from licensed premises unless the odour was emitted in accordance with conditions of the licence or the only persons affected were managing or operating the premises.

The processing of materials that are highly biodegradable causes odours. As well as odour from any single significant source, the cumulative impact of less significant odour sources, such as unclean drains, may result in offensive odours emanating from the premises during particular atmospheric conditions. Common sources of odour from both animal slaughter and rendering plants include improper management of effluent treatment ponds, irrigation areas and organic solid waste disposal areas,

particularly in warmer summer months. Another common potential source of odours in animal slaughtering facilities is the stockyards. For rendering plants, the primary source of odour is the vapours produced by the cookers.

The following issues relating to odour controls were identified at 10 of the 19 premises audited.

Note: In this section the number of relevant premises is considered to be the total for that category even though not all the premises necessarily had the particular equipment or conducted the particular activity in question.

#### **Common to both animal slaughtering and rendering**

- Odours emanated from the aerobic pond due to inadequate processing of effluent in the anaerobic pond (1 of the 19 premises audited).
- Odour emanated from the irrigation area due to insufficient treatment of effluent (1 of the 19 premises audited).
- There was potential for odours emanating from the aerobic pond to be offensive (1 of the 19 premises audited).
- There was potential for odours emanating from the aerobic pond to be offensive, due to insufficient capacity in the anaerobic pond, resulting in the aerobic pond turning anaerobic (1 of the 19 premises audited).
- Odours which emanated from the ponds when they turned over (i.e. when water from the bottom of the pond rose to the top due to climactic conditions) had the potential to be offensive (1 of the 19 premises audited).
- The disposal of treatment pond sludge had the potential to create offensive odours (1 of the 19 premises audited).
- Odours which could emanate from a small area of ponded runoff water from an unknown source had the potential to be offensive (1 of the 19 premises audited).
- The accumulation of organic material in drains had the potential to cause offensive odours (1 of the 19 premises audited).
- Discharging effluent to the sewer had the potential to cause offensive odours to emanate from the sewer vent downgradient of the site (1 of the 19 premises audited).

#### **Specific to animal slaughtering**

- Odours emanating from the shaker screen used to collect solids between the process plant and treatment ponds had the potential to be offensive (1 of the 17 premises audited).
- Due to no documented procedures to ensure odours were minimised or prevented, potentially offensive odours were emanating from sheep carcass burial pits (1 of the 17 premises audited).
- Odours were potentially offensive due to the accumulation of manure in stockyards (1 of the 17 premises audited).
- Paunch contents were being dried in a pit with the potential to cause offensive odours (1 of the 17 premises audited).

#### **Specific to rendering**

- There was inadequate maintenance of the vapour collection ducting which ensured odorous vapours were collected (2 of the 8 premises audited).
- The biofilter operated outside the operating pressure range required by the licence condition which was designed to ensure odours did not emanate from the filter (1 of the 8 premises audited).
- Vapours from the rendering process were not being captured and treated, with the potential for odours to be offensive (1 of the 8 premises audited).

All operators should identify any potential odour sources and where necessary implement appropriate controls and housekeeping measures to prevent odours emanating from these sources, such as regularly cleaning drainage systems. Manure in stockyards should be kept as dry as possible, by roofing where practicable, and be regularly collected. Effluent treatment ponds should be properly designed and maintained so effluent is treated to the required level in each pond before being discharged to the next pond or the irrigation area. Irrigation and organic solid waste disposal should only occur when weather

conditions are such that offensive odours will not impact upon off-site receptors. Odorous vapours from rendering plant cookers and other equipment should be captured and treated. The effectiveness of controls and measures may need to be monitored on an ongoing basis. The use of sufficient buffer zones between facilities and sensitive receptors may minimise the requirement for more stringent controls.

**Practices observed during EPA audit inspections that contributed to the competent environmental management of odour**

- In certain conditions, the anaerobic pond was covered with plastic to minimise odours.
- The rendering plant had a biofilter and back up afterburner in case the biofilter failed.
- In addition to the vapours from the cookers being collected and directed to a biofilter, the entire rendering plant building was maintained under negative pressure with the airflow discharged through a scrubber to remove any background odours.
- Floors and drains were regularly flushed, cleaned and inspected which prevented the build up of organic material which could contribute to odours.

## **Boiler emission control issue**

Inadequately controlled emissions from boilers due, for example, to inadequate maintenance or substandard fuel, can lead to regional and local environmental and human health impacts.

The following issues relating to boiler emissions were identified at 2 of the 19 premises audited.

### **Common to both animal slaughtering and rendering**

- Possibly due to the inadequate quality control of coal used in the boiler, significant emissions had the potential to exceed the regulatory standard (1 of the 19 premises audited).
- Significant emissions of black smoke observed during start-up had the potential to exceed the regulatory standard (1 of the 19 premises audited).

Appropriate maintenance and monitoring schedules should be implemented to ensure emissions from boilers comply with the Clean Air (Plant and Equipment) Regulation 1997.

## **Open air burning issue**

Smoke from the improper open burning of significant quantities of material can cause regional as well as local environmental and human health impacts.

The following issue relating to open air burning was identified at 1 of the 19 premises audited.

### **Common to both animal slaughtering and rendering**

- Inappropriate burning of green waste had the potential to contravene the Control of Burning Regulation (1 of 19 the premises audited).

Any open burning must be conducted in accordance with the Protection of the Environment Operations (Control of Burning) Regulation 2000.

## **WATER POLLUTION**

Surface water and groundwater are fundamentally interconnected and it is often difficult to separate the two because they 'feed' each other. Groundwater, in a broad sense, is all water that occurs below the land surface and largely occurs in aquifers sufficiently permeable to allow water to infiltrate, move through and leave. Filtered down from the surface, groundwater may seep slowly for numerous kilometres and many years, eventually emerging naturally in rivers, springs and marshes. Surface water and groundwater may

gather pollutants from various sources so may contain a variety of contaminants. Water contaminated with pollutants from land can reach surface and coastal waters via runoff from rain, or through contaminated groundwater. Contaminated water can also infiltrate land to an extent where the land itself requires some form of remediation.

Section 120 of the POEO Act prohibits the pollution of any waters including surface water and groundwater. Water pollution from animal slaughtering and rendering facilities can occur from a variety of sources, particularly inadequate effluent management and inadequate storage of materials and waste. All operators should identify activities, plant and equipment that could cause water pollution. Operational procedures and process controls that prevent polluted water emanating from the site should be implemented and maintained. These should include:

- segregating clean stormwater from contaminated water, effluent and waste
- storing chemicals in a contained area
- collecting and treating all effluent and contaminated stormwater.

The effectiveness of controls should be monitored on an ongoing basis.

The following issues relating to water pollution or potential water pollution were identified.

## **Effluent management issue**

Effluent management is the primary environmental issue for animal processing facilities. Typical wastewater from livestock processing industries contains high levels of grease, blood, viscera and manure resulting in high levels of total suspended solids, salt, BOD and nutrients (nitrogen and phosphorous) in the effluent. Nutrients may be flushed or run off from irrigation areas. When excessive quantities of nutrients enter streams and wetlands they contribute to several pollution problems such as algal blooms, fish kills, and general environmental degradation. These problems may persist for many years and be difficult and expensive to rectify. Nutrients may also leach from effluent treatment ponds and irrigation areas, and poorly operated effluent treatment systems and irrigation areas are considered the most likely potential sources of groundwater contamination.

### **Stockyards**

The following issues were identified relating to effluent management from stockyards at 3 of the 14 premises audited.

Note: The three chicken processing premises and two plants conducting rendering only do not have stockyards.

#### **Specific to animal slaughtering**

- Inadequate controls to minimise manure entering treatment ponds meant the ponds had insufficient capacity to deal with the effluent load (1 of the 14 premises audited).
- The quantity of manure in the washdown water directed to the effluent treatment system had the potential to cause the capacity of the system, which effectively treated the effluent, to be exceeded (1 of the 14 premises audited).
- Manure permitted to build up in stockyards for several weeks had the potential to be flushed off-site during wet weather (1 of the 14 premises audited).

If manure is hosed or otherwise flushed from the stockyards and directed to the effluent treatment system, mechanisms should be implemented to ensure the manure in the wash water does not place an excessive load on the treatment system. Additionally, stockyards should be designed and operated so manure is not flushed off-site by wash water or rainwater, particularly during significant rainfall.

**Practices observed during EPA audit inspections that contributed to the competent environmental management of the stockyards**

- Roofed stockyards reduced the effluent loading on the treatment system and prevented contaminated stormwater running off-site.
- Manure was dry scraped rather than flushed from the stockyards, which limited the amount of liquid effluent that needed to be treated and irrigated.

**Process facility**

The following issues were identified relating to effluent management at process facilities at 4 of the 19 premises audited.

**Common to both animal slaughtering and rendering**

- Drains transporting wastewater from the plant to the treatment system were inadequately maintained so drains were blocked with sediment or manure (2 of the 19 premises audited).

**Specific to animal slaughtering**

- There was potential to reduce phosphorous concentrations in wastewater by further preventing bone dust, resulting from bone cutting, entering the waste stream (1 of the 17 premises audited).
- Spent phosphoric acid used for cleaning rusted meat hooks was discharged to the effluent treatment system with the potential to contribute to elevated levels of phosphorous in the soil in the irrigation area (1 of the 17 premises audited).
- There was inadequate handling of salt during the skin salting process, potentially resulting in excess salt entering the effluent treatment system and causing elevated salt concentrations in the soil of the irrigation area (1 of the 17 premises audited).

As much as is practicable, contaminants (such as blood, phosphorous, salt) and solid waste (such as paunch contents) should be excluded or separated from the wastewater stream before it enters the treatment ponds. Fats should be excluded from the wastewater stream once an adequate crust has formed on the anaerobic pond. Drainage systems should be regularly cleaned and maintained to prevent overtopping and inappropriate discharges.

**Practices observed during EPA audit inspections that contributed to the competent environmental management of the process facility**

- A separate blood drainage system directed any blood that collected on the floor of the process areas to a blood holding tank.
- The blood which collected on the floor of the process areas and the first flush of wash water that was applied to these areas were directed to the blood holding tank before the drains to the blood tanks were plugged, and subsequent wash water drained to the effluent treatment system.

**Effluent treatment**

The following issues were identified relating to effluent management at the treatment facility at 10 of the 19 premises audited.

**Common to both animal slaughtering and rendering**

- The concentration of contaminants in effluent discharged to the irrigation area exceeded the limit specified on the licence (1 of the 19 premises audited).
- The effluent storage tank was not maintained in a proper and efficient condition (1 of the 19 premises audited).

- There was inadequate treatment of effluent due to limited retention time in treatment ponds caused by sludge build-up limiting the capacity of the treatment pond (4 of the 19 premises audited).
- There was no treatment of effluent, leading to high BOD concentrations applied directly to the irrigation area (1 of the 19 premises audited).
- Chemicals, such as cleaning agents, which compromised biological processes were flushed into the treatment ponds (1 of the 19 premises audited).
- There was potential for the capacity of treatment ponds, and therefore the level of effluent treatment achieved, to be inadequate (1 of the 19 premises audited).
- The biological treatment process in the effluent treatment pond was potentially compromised by use of inappropriate herbicide around the edges of the pond (1 of the 19 premises audited).
- Insufficient wet weather storage capacity in the ponds potentially resulted in overflow during prolonged wet weather (1 of the 19 premises audited).
- There was potential for significant quantities of uncontaminated water to enter the effluent treatment system during wet weather which could have compromised the effectiveness of the effluent treatment system (3 of the 19 premises audited).
- Seepage from ponds could be occurring, as groundwater monitoring indicated the levels of nutrients were elevated downgradient of the ponds (2 of the 19 premises audited).
- There was potential for the level of treatment to be compromised by excessive build-up of sludge in treatment ponds (2 of the 19 premises audited).

All operators must ensure that appropriate systems and controls are installed to adequately treat effluent so irrigated effluent or effluent discharged to the sewer do not create pollution. Clean water and chemicals that could compromise the effectiveness of the effluent treatment system should not enter the system. All ponds should be designed and maintained (e.g. regularly desludged) to allow for adequate retention time and effluent treatment. Consideration should be given to placing facultative ponds between any anaerobic and aerobic ponds to ensure the aerobic ponds are not being overloaded. Where necessary, the system should incorporate a wet weather storage facility, sized according to local climatic conditions. This would retain treated effluent during wet weather to ensure that the hydraulic capacity of the irrigation area is not exceeded. Operators must ensure that all plant and equipment used to treat effluent is maintained in a proper and efficient condition to prevent the pollution of waters. The effectiveness of the effluent and solids management systems and controls should be monitored on an ongoing basis to ensure they are working effectively.

**Practices observed during EPA audit inspections that contributed to the competent environmental management of effluent treatment systems**

- Parallel anaerobic ponds were used so one pond was operating when the other was taken offline to have accumulated sludge removed.
- Additional capacity, based on local climatic conditions, was incorporated into the pond system designed to contain wastewater during rain, to ensure the hydraulic capacity of the irrigation area was not exceeded.

**Irrigation of effluent**

The following issues were identified relating to effluent management in the irrigation area at 15 of the 15 premises audited.

Note: the three chicken processing facilities and one of the rendering plants discharged all effluent to the sewer and therefore did not irrigate their effluent.

**Common to both animal slaughtering and rendering**

- Discharge points on the irrigation area were not identified as required by the licence (7 of the 15 premises audited).

- The irrigation area was not maintained in a proper and efficient manner (1 of the 15 premises audited).
- The volume of effluent exceeded the capacity of the irrigation area to assimilate the hydraulic loading and was causing ponding (2 of the 15 premises audited).
- The volume of effluent exceeded the capacity of the irrigation area to assimilate the hydraulic loading and was causing runoff (1 of the 15 premises audited).
- The volume of effluent applied to the irrigation area exceeded the specified limit (2 of the 15 premises audited).
- The nutrient load applied to the effluent exceeded the rates of uptake by plants and the capacity of the soil to assimilate it (1 of the 15 premises audited).
- Effluent was discharged to areas other than the defined irrigation areas (3 of the 15 premises audited).
- Information in agronomists' reports was considered inadequate to ensure the irrigation area was properly managed and irrigation practice was sustainable (1 of the 15 premises audited).
- The overall management plan (including soil sampling, agronomists' reports, nutrient budgets) was considered inadequate to ensure the irrigation area was properly managed and irrigation practice was sustainable (1 of the 15 premises audited).
- Soil sampling indicated the irrigation area was not managed properly as the area had elevated concentrations of phosphorous and sodium (1 of the 15 premises audited).
- The nutrients applied in the effluent were not being effectively removed from the irrigation area due to inadequate cropping and grazing practices (2 of the 15 premises audited).
- Appropriate stock withholding periods after irrigation were not adhered to, which could have lead to plugging damage and soil compaction (1 of the 15 premises audited).
- Damage to the irrigation area limited its capacity to assimilate effluent due to the potential for stock to have been on the area before it had dried (3 of the 15 premises audited).
- The capacity of the irrigation area to assimilate the effluent was potentially limited as stormwater was permitted to flow from upgradient onto a section of the area (1 of the 15 premises audited).
- The effluent utilisation area was potentially of an insufficient size to assimilate the volume of effluent applied (1 of the 15 premises audited).
- Stock rather than machines were used to remove crops, potentially increasing the nutrient load on the irrigation area, particularly as the size of the area was very limited (1 of the 15 premises audited).
- There was potential for runoff from the irrigation area due to inadequate wet weather storage (1 of the 15 premises audited).
- The irrigation area was potentially not properly managed as soil analysis results were not assessed to quantify the ability of soils in the area to absorb nutrients and salts (1 of the 15 premises audited).
- Irrigation was potentially not properly managed as groundwater sampling and analysis results were not interpreted to assess the impact of effluent irrigation on groundwater quality (1 of the 15 premises audited).
- There was potential for irrigation to contaminate groundwater as there were elevated levels of nutrients in the spring downgradient of the irrigation area (1 of the 15 premises audited).
- There was potential for runoff due to lack of terminal ponds (1 of the 15 premises audited).

The volume and concentration of the effluent should be periodically measured and the results monitored over time, to ensure that the level of nutrients, salt and volumes of water irrigated is sustainable in the long term. The nutrient loads removed by cropping or grazing should be fully assessed and appropriate nutrient budgets constructed. Soil sampling and analysis should also be periodically conducted and the results monitored over time to validate nutrient budgets and ensure the loads applied do not exceed the rates of removal by plants or assimilation in soil. Clear action plans should be in place for correcting any imbalances in the nutrient, salt or hydraulic budgets. If necessary, a consultant should be engaged to review the monitoring results, prepare the nutrient budgets and provide advice on appropriate crops and pastures for the system.

The maximum hydraulic assimilative capacity of the area should be maintained by, for example, installing and maintaining diversion drains upslope of the area to prevent any water from upslope flowing onto the area. Adequate wet weather storage, based on local climatic conditions, should also be available to prevent

overtopping or uncontrolled discharges from ponds during wet weather and periods of low irrigation demand. Terminal collection ponds should also be provided so any effluent flushed off the area is collected and can be re-irrigated (or recirculated).

All the above elements, including relevant sections of any consultant's report, should be integrated into an overall management plan which is periodically updated.

**A practice observed during EPA audit inspections that contributed to the competent environmental management of an irrigation area**

- Large terminal ponds captured any effluent which could be flushed off the irrigation area.

## **Solid organic and general waste management issue**

Significant quantities of general solid waste can be produced at animal slaughtering and rendering facilities and organic solid waste at slaughtering facilities. All wastes must be managed in a way that prevents odours and water pollution and be disposed of in accordance with the *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes* (EPA 1999).

### **Organic material disposal**

Animal slaughtering facilities can produce significant quantities of organic material. Offal is sent to a rendering plant and organic material captured in drain sieves and effluent pretreatment screens is usually also sent for rendering or disposed of at an appropriate waste facility. However, manure, blood, paunch contents and solids collected in pre-treatment systems are often disposed of on-site at a designated solid waste disposal area and in some cases disposed of on the irrigation area. Other organic wastes, such as animals that were dead upon arrival at the facility, may also be disposed of on-site.

The following issues relating to organic wastes not being stored or disposed of in a manner that would prevent odours and water pollution were identified at 5 of the 19 premises audited.

#### **Specific to animal slaughtering**

- The disposal on-site of solid wastes collected by rotary screen had not been approved by the EPA as required by the licence (1 of the 19 premises audited).
- DAF skimmings were not disposed of in a way that prevented infiltration to stormwater (1 of the 19 premises audited).
- Paunch contents were mixed with water and piped as a slurry to the pre-treatment pit system from which seepage with the potential to pollute waters was occurring (1 of the 19 premises audited).
- There was potential for leachate from pig hair and the carcass composting area to overflow and pollute waters (1 of the 19 premises audited).
- Manure removed from stockyards was placed where it could pollute waters (1 of the 19 premises audited).
- Contaminated seepage downgradient of the paunch contents pretreatment area had the potential to flow off-site (1 of the 19 premises audited).

Manure, blood, paunch contents and solids collected in pre-treatment systems should only be spread on an appropriate on-site or off-site land disposal area if:

- the weather conditions are such that any offensive odours which may occur will not impact upon off-site receptors
- the material is properly incorporated into the land by, for example, regular harrowing
- the area is capable of assimilating the material.



Foreign matter, such as plastic throat plugs, should also be screened from the material before it is applied. To properly manage potential odour and water pollution issues, dead stock should be managed in accordance with the 'Dead Stock Disposal' guidance material contained in the EPA's Authorised Officers Manual (see 'Recommended Reading').

The concentrations of key parameters, such as nutrients and salts, in the soil of a solid waste disposal area should be periodically measured and the results monitored. Clear action plans should be in place so they can be activated if the capacity of the plants and soil to assimilate the solids and their constituents is exceeded. This will prevent the pollution of surface water and groundwater and assist in ensuring the organic solid waste disposal is sustainable.

**Practices observed during EPA audit inspections that contributed to the competent environmental management of an organic material disposal area**

- Manure was dry scraped from the stockyards and processed in a worm farm.
- Paunch material was removed from the waste stream and taken off-site to be composted in a worm farm.

### **General solid waste management**

Significant quantities of general solid waste may be generated at animal slaughter and rendering facilities. Such waste may include building materials, decommissioned equipment, empty containers, excess packaging material and old pallets.

The following issues relating to wastes not being stored in a manner that would prevent water pollution were identified at 3 of the 19 premises audited.

#### **Common to both animal slaughtering and rendering**

- There was a lot of general solid waste including building materials, timber pallets and empty drums stored in yard areas with the potential to cause water pollution (2 of the 19 premises audited).
- Disused batteries were stored without adequate containment with potential to pollute waters (1 of the 19 premises audited).

All general solid waste must be stored in a manner that prevents water pollution and be disposed of in accordance with the *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes* (EPA 1999).

### **Materials storage issue**

Any leaks and spills of solid or liquid materials that are not properly handled or stored in appropriate isolated areas could either drain or be flushed to waters, causing water pollution, or to the effluent treatment system, compromising the effectiveness of the system.

The following issues relating to materials not being stored in a manner that would contain spills and leaks to prevent the pollution of waters were identified at 11 of the 19 premises audited.

#### **Common to both animal slaughtering and rendering**

- Unbundled chemical containers could result in chemicals entering the stormwater system or effluent treatment system (4 of the 19 premises audited).
- A damaged bund wall around the chemical storage facility made it ineffective (1 of the 19 premises audited).
- A drum storage bund of insufficient size resulted in some drums being stored outside the bunded area (1 of the 19 premises audited).

- A diesel tank bund was ineffective as the building wall that formed one side of bund contained air vents (1 of the 19 premises audited).
- Disused drums partially full of known and unknown liquids were stored in an unbunded area (5 of the 19 premises audited).
- No effective bunding surrounded the fuel storage tanks and fuelling area (6 of the 19 premises audited).
- The chemical storage facility bund drained to the effluent treatment system, so chemicals could compromise the effectiveness of the treatment system (1 of the 19 premises audited).
- A container of offal stored outside the bunded area had the potential to leak and pollute waters (1 of the 19 premises audited).

#### **Specific to animal slaughtering**

- There was inadequate bunding around the blood storage tanks (1 of the 19 premises audited).
- A leaking blood tank had the potential to increase the pollutant load on the treatment system (1 of the 19 premises audited).

#### **Specific to rendering**

- Tallow storage tank bunds had not been maintained and contained gaps, and spilt material had not been cleaned out (1 of the 6 premises audited).

All operators should identify any material storage activities that may impact on the quality of water flowing from the premises or impact on the effluent treatment system, and ensure that controls, such as impervious bunds, are in place and regularly maintained to prevent any such impacts.

## **Miscellaneous issues**

Numerous additional potential sources of surface water and groundwater pollution exist at animal slaughter and rendering facilities. Poor housekeeping at various points throughout the premises is a particularly common source, e.g. inadequate cleaning of yard areas and drains.

The following issues relating to the miscellaneous issues were identified at 7 of the 19 premises audited.

Note: In this section the number of relevant premises is considered to be the total for that category even though not all the premises necessarily had the particular equipment or conducted the particular activity in question.

#### **Common to both animal slaughtering and rendering**

- Water polluted with pig hair and contamination from dirty processing hooks and old machinery could be discharged from the premises during wet weather, due to inadequate housekeeping (1 of the 19 premises audited).
- Stormwater drains were full of sediment, which could be flushed off-site by stormwater (1 of the 19 premises audited).
- Polluted runoff from skin sheds could enter the river adjacent to the site (1 of the 19 premises audited).
- There was a potential for biologically contaminated runoff from the disused equipment storage area (1 of the 19 premises audited).
- Liquid leaking from offal trucks could be discharged to stormwater (1 of the 19 premises audited).
- A damaged roofwater downpipe resulted in the potential for pollutants to be flushed to the stormwater system (1 of the 19 premises audited).

#### **Specific to animal slaughtering**

- Organic wastes spilling onto trafficable areas had the potential to be flushed by rainwater to the stormwater system (1 of the 17 premises audited).
- There was potential for polluted runoff from holding paddocks to enter the river adjacent to the paddocks (1 of the 17 premises audited).

### Specific to rendering

- Condensate from the rendering plant condenser flowing across a concrete apron before entering the collection pit had the potential to be washed to the stormwater system during extreme wet weather (1 of the 6 premises audited).

All activities conducted on the premises should be assessed to determine where contaminated discharges may occur. Systems should be developed to ensure appropriate housekeeping procedures and maintenance programs are in place and implemented to prevent any polluted discharges.

#### **A practice observed during EPA audit inspections that contributed to the competent environmental management of external yard areas**

- At several premises, external yard areas potentially subject to limited contamination, e.g. truck loading areas, were regularly vacuum swept and drained to a first flush system. This system captured any material flushed from the surface during rain and any spills. Spills were pumped into containers for transport to an appropriate disposal facility and the first flush from rain was directed to the effluent treatment system.

## Pollution of water issue

Under section 120 of the POEO Act 1997 it is an offence to pollute waters. Pollution of waters essentially means introducing (whether through an act or omission) into or onto waters any matter whether solid, liquid or gaseous that changes the physical, chemical or biological condition of the waters.

Under section 120 it is also an offence to place (whether through an act or omission) material in a position where it is *likely* to fall, descend, be washed, be blown or percolate into any waters or the dry bed of any waters or into any drain, channel or gutter used or designed to receive or pass rainwater, floodwater or any water that is not polluted.

Waters include the whole or any part of a stream, river, lake, wetland, natural or artificial water course, dam or tidal waters and underground water. (Section 120 of the POEO Act should be consulted for a full definition of water pollution.)

Issues relating to the actual or likely pollution of waters were identified at 2 of the 19 premises audited.

### Issues common to both animal slaughtering and rendering

- Effluent irrigated onto the irrigation area while stormwater was flowing across it resulted in effluent being discharged off-site (1 of the 19 premises audited).
- A limited quantity of wastewater from the rotary screen was not being captured and directed to the effluent treatment system, but flowed outside the bunded area from where it was likely to be flushed to the stormwater system by rainwater (1 of the 19 premises audited).
- Stormwater drains were full of sediment, which could be flushed off-site by stormwater (1 of the 19 premises audited).

### Specific to animal slaughtering

- There were inadequate controls to prevent both contaminated stormwater and washdown water from stockyards flowing offsite (1 of the 17 premises audited).

Inadequate material storage and waste management, runoff from stockyards and irrigation areas and poor housekeeping throughout the premises are common sources of surface water pollution at animal slaughtering and rendering facilities. Operators should identify activities, plant and equipment that may impact on the quality of water flowing from the premises and ensure that controls are in place to prevent the pollution of surface water.

Poorly operated effluent treatment systems, irrigation areas and organic solid waste disposal areas are considered the most likely potential sources of groundwater contamination at animal slaughtering and rendering facilities. Fuel storage facilities, particularly underground storage tanks, are also a common source of groundwater contamination. Operators should identify any existing or emerging groundwater issues and ensure controls are in place to prevent groundwater pollution.

Monitoring to determine the effectiveness of the controls should also be undertaken. If monitoring indicates that the controls are not effective, operators need to take action quickly to stop any pollution, remediate the area and prevent pollution occurring in the future.

## **LOSS OF AMENITY AND HAZARDS**

The potential amenity and hazard impacts from animal slaughtering and rendering include dust, odour, noise, vermin/pests/weeds and site security.

The following issues relating to loss of amenity and hazards were identified.

### **Dust control issue**

Issues relating to dust controls were identified at 2 of the 19 premises audited. See details under 'Air Pollution'.

Dust controls should minimise pollutants leaving the site as airborne dust, reduce sediment pollutant load, and protect local amenity.

### **Odour control issue**

Issues in relation to odour controls were identified at 12 of the 19 premises audited. See details under 'Air pollution'.

All operators should implement appropriate control measures and take appropriate housekeeping steps to prevent the production of odours. The use of sufficient buffer zones between facilities and sensitive receptors may minimise the requirement for more stringent controls.

### **Noise control issue**

The following issue related to noise controls was identified at 1 of the 19 premises audited.

#### **Common to both animal slaughtering and rendering**

- The noise report indicated noise levels were exceeded, and no attenuation measures had been installed at the time of the audit (1 of the 19 premises audited).

Operators should ensure that appropriate noise controls are installed and maintained at the site to prevent off-site amenity impacts.

## **MONITORING**

Animal slaughtering and rendering facilities have some emissions and discharges that could adversely affect amenity and impact on the environment. A valuable management tool to prevent or minimise adverse affects and impacts is to monitor emissions and discharges and the areas and systems which may be affected by them.

Pollutant concentrations and other useful parameters should be measured, such as wind speed and direction. To properly monitor any actual or potential pollution issue, the relevant measurements must be carried out often enough to characterise the level of pollutants or the impact of particular weather conditions. Effective monitoring requires:

- the results of measurements to be analysed and assessed on an ongoing basis against any previous results and relevant criteria or background levels
- any trends to be identified and documented.

This will allow the operator to determine the likelihood for any potential pollution issues, the nature of any pollution caused by the activities conducted at the premises and actions required to rectify any problems. Monitoring required by a licence condition must be undertaken in accordance with any relevant EPA Approved Methods Manuals such as *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (EPA 2001) or *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales* (EPA 1998) to provide greater confidence that the results of the monitoring reflect the true nature, and environmental impact, of emissions. If methods are not specified in the manuals, monitoring must be undertaken in accordance with any methodology which a licence condition requires or if there is no such requirement, any methodology approved by the EPA in writing.

The following issues relating to monitoring were identified.

## Monitoring of effluent volume and concentration

Typical effluent from livestock processing industries contains high levels of pollutants including total suspended solids, salt, BOD and nutrients (nitrogen and phosphorous). If this effluent is not properly managed and controlled it can have a serious impact on the environment

The following issues relating to monitoring of volume and concentration of effluent were identified at 12 of the 19 premises audited.

### Common to both animal slaughtering and rendering

- The volume of effluent was not monitored as required by the licence (1 of the 19 premises audited).
- The volume of effluent was not monitored at the frequency required by the licence (2 of the 19 premises audited).
- Samples of effluent were taken at a location other than that specified on the licence (2 of the 19 premises audited).
- Operators did not analyse for all parameters in effluent as required by the licence (2 of the 19 premises audited).
- The analysis of parameters within the effluent was not in accordance with approved methods (5 of the 19 premises audited).
- No record of samples of treated effluent sent for analysis was kept (1 of the 19 premises audited).
- Inadequate monitoring of the volume of effluent entering the treatment system had potential to limit understanding of effectiveness of the treatment system (1 of the 19 premises audited).
- Inadequate monitoring of the concentration of effluent had the potential to limit understanding of the effectiveness of the treatment system and the sustainability of irrigation practice (4 of the 19 premises audited).
- Inadequate monitoring of the volume of effluent had the potential to limit understanding of the sustainability of irrigation practice (3 of the 19 premises audited).
- The volume of effluent irrigated was determined by an estimate of inputs and not accurately measured, resulting in the potential to compromise the optimum management of irrigation practice (1 of the 19 premises audited).

Monitoring the concentration of effluent entering the treatment system and the effluent being discharged from the system enables a comparison and assessment of the effectiveness of the system. Monitoring the volume and concentration of the effluent being discharged to an irrigation area, particularly when linked to

knowledge of the assimilative capacity of the area, will facilitate proper management of the irrigation area. This will prevent the pollution of surface water and groundwaters and assist in ensuring the sustainability of the irrigation practice.

## **Monitoring of irrigation and solid waste disposal area soil**

The following issues relating to the monitoring of irrigation area soil were identified at 11 of the 15 premises audited.

Note: The three chicken processing facilities and one of the rendering plants discharged all effluent to the sewer and did not have irrigation or solid waste disposal areas.

### **Common to both animal slaughtering and rendering**

- Operators did not monitor at the frequency required by the licence (2 of the 15 premises audited).
- Operators did not analyse for all parameters required by the licence (2 of the 15 premises audited).
- The analysis was not in accordance with approved methods (3 of the 15 premises audited).
- Individual samples rather than composite samples as required by the licence were taken (1 of the 15 premises audited).
- ❑ The lack of soil sampling and analysis resulted in the potential for the level of effluent treatment required to not be fully understood and for utilisation area management to be compromised (8 of the 15 premises audited).
- ❑ No soil analysis in the solid waste disposal area resulted in the potential for management of the area to be compromised (1 of the 15 premises audited).

Proper management of the irrigation area would be facilitated by monitoring the concentrations of key parameters in the soil in an irrigation area, particularly when linked to effluent monitoring data and nutrient budgets. Such monitoring would help prevent surface water and groundwater pollution and ensure the irrigation practice is sustainable in the long term. For example, annual soil sampling should be undertaken at two depths at least (including below the root zone), at a number of representative locations and using the same locations and analysis methods each year. Similar monitoring at strategic locations should also be undertaken to ensure any solid waste disposal practices are sustainable and do not result in surface water and groundwater pollution.

## **Monitoring of surface water and groundwater**

The following issues relating to the monitoring of surface water and groundwater were identified at 7 of the 19 premises audited.

### **Common to both animal slaughtering and rendering.**

- Not all the parameters required by the licence were being assessed in groundwater (1 of the 19 premises audited).
- ❑ The licensee had not sampled the groundwater in bores located on properties in the vicinity of the premises to determine if effluent irrigation was potentially resulting in pollution of groundwater (1 of the 19 premises audited).
- ❑ The licensee had not sampled groundwater to determine if effluent irrigation was potentially resulting in pollution of groundwater (3 of the 19 premises audited).
- ❑ The licensee had not retained copies of surface water monitoring results, potentially limiting the management of irrigation practice (1 of the 19 premises audited).
- ❑ The surface water quality monitoring regime was potentially not representative (1 of the 19 premises audited).

Monitoring key parameters in surface water and groundwater at strategic locations can help identify any emerging issues. Such locations may include points downgradient of effluent treatment ponds and

irrigation areas. This monitoring should facilitate the timely implementation of any measures required to rectify any problems.

## **Weather monitoring**

The following issue relating to weather monitoring was identified at 1 of the 19 premises audited through the following observation.

### **Common to both animal slaughtering and rendering.**

- The weather monitoring station was not maintained (1 of the 19 premises audited).

Monitoring weather conditions such as rainfall to assist in proper management of irrigation areas and wind speed and direction to prevent spray drift, can be useful to ensure pollution and amenity issues do not arise. Monitoring stations must be strategically located and maintained in a proper and efficient condition to ensure that information which may provide a valuable management tool is available when required.

## **ACCOUNTABILITY**

The following issues relating to administrative requirements were identified. All these issues were common to both animal slaughtering and rendering.

### **Submission of information**

The following issue relating to information and data not being provided to the EPA was identified at 1 of the 19 premises audited.

- The EPA did not receive the written report it requested (1 of the 19 premises audited).

It is important that all information required by the EPA as a condition of a licence is provided within the required timeframe and contains all the data requested. The EPA uses this data to regulate the environmental impacts of the site.

### **Records of monitoring**

The following issues relating to failure to record and keep monitoring records as required were identified at 4 of the 19 premises audited.

- Monitoring records did not include the time of sampling (2 of the 19 premises audited).
- Monitoring records did not include the name of the person who collected the sample (1 of the 19 premises audited).
- Records of sampling were not provided to the EPA (1 of the 19 premises audited).
- A record of meteorology data was not kept (1 of the 19 premises audited).

The operator should keep accurate and detailed records of monitoring undertaken for quality assurance purposes and to ensure that the monitoring data can be interpreted and acted upon.

### **Pollution complaints**

The following issues relating to pollution complaint records or telephone lines were identified at 10 of the 19 premises audited.

- The record of pollution complaints kept by the licensee in accordance with the licence was incomplete or a record of complaints was not kept (3 of the 19 premises audited).

- The public was not notified of the existence of a telephone complaints line, or a telephone line through which the community could make a complaint was not available (8 of the 19 premises audited).
- The telephone complaints line was not operating within three months as required by the licence (2 of the 19 premises audited).

Complaints received can be valuable tools for monitoring the environmental impact of an activity on the local community. By keeping the required information on pollution complaints, operators will be in a position to clearly demonstrate that complaints are being satisfactorily addressed.

## **Annual returns**

The following issues relating to annual returns were identified at 4 of the 19 premises audited.

- An annual return was not submitted or not submitted within 60 days of the end of the reporting period (2 of the 19 premises audited).
- Information required by the licence submitted with the annual return was incomplete (2 of the 19 premises audited).

It is important that all information required in the annual return is provided within the required timeframe and contains all the data requested. The EPA uses this data to regulate the environmental impacts of the site.

## **Inform EPA of contact number for incidents**

The following issues relating to contact numbers for incidents were identified at 2 of the 19 premises audited.

- The EPA was not informed of the contact number within three months of the licence taking effect (2 of the 19 premises audited).

It is important that the EPA has a 24-hour contact number for the premises so if any incidents occur and are reported to the EPA's Pollution Line, or directly to an EPA officer, the EPA can contact a nominated site representative so the company can take appropriate action to prevent or minimise any pollution issues.



## WHERE TO FROM HERE?

The issues identified in the representative sample of licensed livestock processing facilities (19 out of a total 61) are likely to be generally typical of the whole livestock processing sector. Common issues identified related to the areas of pollution or potential pollution of air and water.

Based on the audits, it has been identified that the key areas where the industry could improve its compliance and environmental performance include:

- air pollution—by improving odour controls
- water pollution—by improving effluent management and materials storage
- monitoring—by improving effluent, soil, surface water and groundwater monitoring
- accountability —by notifying the public of the company’s complaints line.

While the EPA, through a systematic and rigorous process of follow-up action programs, ensures that these particular issues are being addressed at the audited sites, they are likely to be of concern at any premises conducting animal processing and warrant an ongoing focus by site management at all animal processing facilities. The EPA will ensure that the issues identified are also being addressed at the premises that were not audited as part of the sector audit program. It is envisaged that industry will prioritise areas of concern that require addressing at each site in the animal processing sector.

The EPA recognises that reporting on the state of the animal processing sector’s environmental performance will be a valuable management tool. The EPA will therefore circulate information in this report to relevant stakeholders and seek cooperative opportunities to work with the industry to improve its environmental performance.

The EPA will use the findings of this sector report to review how best it can channel its resources to guide industry to address the issues identified. The EPA will consider using a suite of tools in addition to regulatory instruments to address environmental issues that were found to be prevalent across the sector. The findings of this report will also be useful in the licence reviews the EPA undertakes under the POEO Act.

# APPENDIX A: LIST OF LICENSED PREMISES AUDITED

The findings of this report are based on the results of compliance audits of the following licensed premises:

## **Animal slaughter (poultry)**

- Red Lea Chickens Pty Ltd (Lic No. 5069)
- Cordina Chicken Farms Pty Ltd (Lic No. 2880)
- Baida Poultry Pty Ltd (Lic No.10815)

## **Animal slaughter (cattle, sheep, pigs etc)**

- Narasell Pty Ltd (Lic No.5348)
- Bunge Meat Industries Ltd (Lic No. 1399)
- Gundawang Holdings Pty Ltd (Lic No.3102)
- Northern Cooperative Meat Company Ltd (Lic No.3284)
- Wollondilly Abattoirs Pty Limited (Lic No.422)
- D.P.S. Abattoirs Pty Limited (Lic No.2656)
- Griffith Abattoirs Pty Ltd (Lic No.3903)
- Famicorp Pty Ltd (Lic No. 11614)

## **Rendering**

- A J Bush & Sons (Manufacturers) Pty Ltd (Lic No.1100)
- G.H. Michelle and Sons (Australia) Proprietary Limited (Lic No.2634)  
(also conducted tanning)

## **Animal slaughter and rendering**

- Cargill Australia Pty Ltd (Lic No. 1328)
- DA Holdings Pty Ltd (Lic No.341)
- Chillana Pty Ltd (Lic No.6032)
- Monbeef Pty Limited (Lic No. 3838)
- Shellden Pty Ltd (Lic No. 11279)
- Cargill Australia Limited (Lic No. 2262)

Individual compliance audit reports for all of these facilities are publicly available in the EPA library on Level 15, 59–61 Goulburn Street, Sydney.

# RECOMMENDED READING

## General

- NSW EPA website: [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au) (Resource Centre/For Industry and Small Business/Authorised Officers Manual/ Industry/Abattoirs)
- USEPA websites:
  - [www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/live.html](http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/live.html)
  - [www.epa.gov/ttn/chief/ap42](http://www.epa.gov/ttn/chief/ap42)
- Western Australian Environment Protection Authority 1991, *Environmental Code of Practice—Rendering Plants*
- Western Australian Environment Protection Authority 1996, *Environmental Code of Practice—Abattoirs*

## Odour

- NSW EPA 2001, *Draft Policy: Assessment and Management of Odour from Stationary Sources in NSW*
- NSW EPA 2001, *Technical Notes—Draft Policy: Assessment and Management of Odour from Stationary Sources in NSW*

## Effluent treatment

- Kruger I, Taylor I and Ferrier M 1995, *Effluent at Work*, NSW Agriculture

## Irrigation

- NSW EPA 1995, *Draft Environmental Guidelines for Industry: The utilisation of treated effluent by irrigation*

## Soil sampling

- NSW Agriculture 1987, *Soil Testing Methods and Interpretation*, Biological and Chemical Research Institute
- NSW Agriculture 1999, *Soil Analysis and Interpretation Manual*, ASPAC

## Bunding and spill management

- NSW EPA website: [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au) (Resource Centre/For Industry and Small Business/Authorised Officers Manual)

## Stormwater first flush pollution

- NSW EPA website: [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au) (Resource Centre/For Industry and Small Business/Authorised Officers Manual)

## Dead stock disposal

- NSW EPA website: [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au) (Resource Centre/For Industry and Small Business/Authorised Officers Manual)

## REFERENCES

Environment Protection Authority 1999, *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes*.

Environment Protection Authority 1998, *Approved methods for the sampling and analysis of water pollutants in New South Wales*.

Environment Protection Authority 2001, *Approved methods for the sampling and analysis of air pollutants in New South Wales*.