

WASTEWATER MANAGEMENT GUIDELINES FOR MEAT PREMISES & PET FOOD WORKS

DEPARTMENT OF PRIMARY INDUSTRIES, WATER & ENVIRONMENT

Regulatory authorities should not permit the point source discharge of pollutants to surface waters from new or existing meat premises or pet food works unless there are exceptional circumstances. These cases are to be referred by the regulator to the Board of Environmental Management and Pollution Control for advice.

1. Introduction

The primary purpose of this document is to provide advice to regulators on wastewater management requirements for meat premises and pet food works. It also provides some guidance to operators on best practice environmental management in their industry sector.

The Board of Environmental Management and Pollution Control (the Board) is required under the *State Policy on Water Quality Management 1997* (the Policy) to publish emission limit guidelines for a number of common activities which are likely to give rise to point source discharges of pollutants to surface waters. Point source pollution is pollution which is emitted at a discrete, identifiable location, usually via a discharge pipe or outfall, and which can be readily measured.

Emission limit guidelines are primarily intended for the use of local government to assist with planning decisions and with the maintenance of water quality objectives. While the Policy focuses on the receiving environment and prevention of environmental harm, there is recognition, particularly for small to medium scale activities, that 'end of pipe' limits may be the only practical approach to regulation. Setting permit conditions based on the receiving environment would require considerable resources that are often not available, and may only be feasible for larger scale activities.

Abattoirs and slaughterhouses are nominated in the Policy as a possible point source of pollutant discharge to surface waters. However, consultation with the meat processing sector indicated that point source discharge to waterways is not industry accepted best practice. Information on best practice environmental management in the meat processing sector from state, national and international sources supported this view. A state-wide meat industry telephone survey conducted in October 2000 revealed that only a small number of premises discharge to waterways as part of their existing wastewater management system. In general, regulators should set a 'no discharge to

waterways' requirement for meat premises and pet food works.

2. Policy Background

Under the *State Policy on Water Quality Management 1997*, protection of surface water and groundwater quality is achieved by determining the range of existing values and uses for specific bodies of water, which then provide the basis for setting water quality objectives (WQOs). Any number of the protected environmental values (PEVs) listed below can be assigned to a specific water body:

- Protection of aquatic ecosystems (pristine or modified)
- Recreational water quality and aesthetics
- Raw water for drinking water supplies
- Agricultural water uses (irrigation, stock watering)
- Industrial water supply

The nomination of PEVs is a community-based consultative process involving users, stakeholders and other interest groups. The PEVs for regional waterways will be shown in local government planning schemes or equivalent planning instruments. Once PEVs are assigned to a body of water, the Board will determine the water quality guidelines (numerical values for key indicators) to achieve the specific PEVs. The most stringent set of guidelines are the WQOs for that body of water.

Activities that discharge point source pollutants to surface waters are a potential obstacle to the achievement of WQOs for regional waterways. Local councils are responsible through the Resource Management and Planning System for the prevention or control of pollution in surface water and groundwater by activities within their jurisdiction which are not level 2 or level 3 activities (level 1, 2 and 3 activities are defined under the *Environmental Management & Pollution Control Act 1994*). This role may be shared with other authorities in some areas (e.g. national parks, other crown land). Larger scale industrial activities - level 2 activities - such as those in the food-processing, mineral and extractive, and waste disposal sectors are regulated by the Board. Regulators should set limits (including zero discharge restrictions where appropriate) on the permissible concentrations and/or loads of pollutants discharging from point sources into waterways to ensure that the achievement of WQOs will not be prejudiced.



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3. Meat Premises and Pet Food Works

The term “meat premises” and “pet food works” used within this document are as defined in the *Meat Hygiene Act 1985* (No. 114 of 1985) and include all activities at those facilities. The definitions are as follows:

“**meat premises**” means – premises used, or intended to be used for or in connection with the processing of animals or animal carcasses for the production of meat for human consumption.

“**pet food works**” means -

(a) a works that is used for slaughtering animals or birds for the production of pet food, for producing pet food from animals or birds so slaughtered or from carcasses of animals or birds delivered to the works, and for storing the pet food so produced; or

(b) a works that is used for producing pet food or slaughtering products from carcasses of animals or birds delivered to the pet food works - and includes all places and facilities used, or intended to be used, for, or in connection with, the convenience and hygiene of the persons employed at that works

4. Regulation

Operators of meat premises and pet food works may be required to hold a permit issued by a planning authority under the *Land Use Planning and Approvals Act 1993*. Conditions of operation detailed in the permit are legally binding. Operators are also subject to regulation under the *Meat Hygiene Act 1985* as enforced by the Meat Hygiene Section of the Department of Primary Industries, Water and Environment (DPIWE).

In addition, the *Environmental Management and Pollution Control Act 1994* (EMPCA) contains provisions for the prevention of environmental harm and nuisance. Mechanisms available under this Act such as environment protection notices are applicable to meat premises and pet food works whether or not a permit is held. Under EMPCA, the production levels of meat premises and pet food works determine whether the regulatory authority is the Board of Environmental Management and Pollution Control or local government. Larger premises processing greater than 100 tonnes of product per year are classified as ‘level 2’ activities and are regulated by the Board. Smaller plants are regulated by local councils.

5. Australian Standards

Authorities with regulatory responsibilities for meat processing activities must enforce compliance with the following standards

- *Australian Standard for Construction of Premises Processing Meat for Human Consumption.*
- *Australian Standard for Hygienic Production of Meat for Human Consumption.*
- *Australian Standard for Construction of Premises for Processing Animals.*
- *Australian Standard for Hygienic Production of Poultry Meat for Human Consumption.*

Officers of the Meat Hygiene Section of DPIWE undertake inspections of product and premises hygiene and audit Quality Assurance Programmes.

Wastewater management requirements outlined in the Australian Standards are that:

- premises shall be provided with waste disposal systems sufficient to handle, and where necessary, treat all liquid and solid waste;
- where provided, meat transport vehicle wash areas shall have an impervious surface and be graded and drained to the drainage system and be constructed to confine wash water and effluent to the area; and
- effluent and sewage shall be disposed of by a means required by the relevant authorities and in a manner that prevents contamination of potable water supplies.

6. Processing Operations

Meat premises and pet food works operations may cover a range of activities:

- receiving and holding of livestock
- slaughter and carcass dressing of animals
- chilling of carcass product
- carcass boning and packaging
- freezing of finished carcass and cartoned product
- rendering processes
- drying of skins
- treatment of wastewater
- transport of processed material.

While meat premises tend to generate a high volume of waste compared to the amount of product produced, the quantity and characteristics of the wastewater from this industry will be influenced by plant size, size and type of animal slaughtered, amount of on-site processing, extent of wastewater segregation and recycling and re-use.

Hygiene requirements can require meat premises to use large volumes of water for cleaning equipment, plant and products, and for wash-down and processing operations.

7. Environmental Impacts

While liquid wastes are largely organic and biodegradable, they can cause environmental harm in waterways if not properly managed.

- Wastewater typically has high biochemical oxygen demand (BOD), often 2-5 times higher than untreated domestic wastewater. High oxygen demand can use up all available oxygen in waterways. This will generate offensive odours and kill aquatic life.
- High levels of suspended solids can reduce light transmission in the water column, increase turbidity and have deleterious effects on aquatic life such as the clogging of gills in fish.
- Elevated loadings of nitrogenous and phosphatic matter can have direct toxic impacts (ammonia) or can lead to excessive algal growth producing longer term problems with odour and toxic algal species.

- Pathogenic organisms such as bacteria and viruses which are harmful to humans and other animals can be introduced to waterways.
- Some liquid wastes may contain high levels of soluble salts which degrade freshwater ecosystems and may restrict downstream irrigation or other water use.
- Disinfectants such as chlorine used during cleaning activities or wastewater treatment are harmful if discharged to the aquatic environment.

8. Waste Management Hierarchy

The Policy requires that pollutant discharges to the environment should be reduced to the maximum extent that is reasonable and practical having regard to best practice environmental management, and in accordance with the following hierarchy of waste management, arranged in decreasing order of desirability:

1. waste avoidance;
2. recycling/reclamation;
3. waste re-use;
4. waste treatment to reduce potentially degrading impacts;
5. waste disposal.

It follows, therefore, that before an activity is permitted to discharge effluent to surface waters, the managers of the activity must first demonstrate to the satisfaction of the Board that all of the above waste management options have been considered and that all reasonable and practical pollutant reduction measures have been implemented. Discharges from meat premises and pet food works will only be approved in exceptional circumstances.

9. Pollution Control through Waste Prevention

A full examination of the process by-products and wastes should be carried out to identify options for waste prevention. While this is particularly important at the planning and design phase for new premises, existing operations may provide opportunities for improvement. Reuse or recycling of by-products results in reduction of wastes. Recovery of valuable materials from waste streams is economically and environmentally sensible. Options for waste prevention and reduction may be to:

- change processes or plant used
- change product composition, packaging or durability
- change or reduce raw material inputs
- improve controls of process
- improve materials handling and cleaning operations
- improve maintenance and repair of equipment
- recycle waste internally
- reuse waste on site
- recover materials from waste streams.

10. Minimising the Pollutant Load

The high standards of hygiene required to ensure quality of products and the health of the workforce shouldn't be compromised in reducing the waste load. Nonetheless,

areas to consider for reducing the total volume of water and the pollutant load requiring treatment include the following.

- Operators should be trained in water conservation.
- Gross solid wastes should be removed from animal pens and processing areas by dry clean-up methods (such as sawdust absorption – NB sawdust is not permitted in processing areas) prior to hosing down to minimise the amount of hose-down water. Solids collection traps should be used on all drains. Reductions in solid wastes means less biochemical oxygen demand and suspended solids loading on the primary treatment system.
- Blood can cause significant problems in waste water unless efficient blood collection/separation facilities are used and should not be discharged as liquid waste.
- Using high pressure water hoses with automatic shut-off valves will minimise the amount and therefore the cost of water used.
- All process areas must have concrete floors graded to wash down drains.
- All chemical storage areas and chemical-based odour control equipment should be located on impermeable concrete floors with bunding capable of containing 110 per cent of any spillage.
- Stormwater should be controlled using the following techniques. Clean stormwater must be kept away from areas where it may be contaminated and directed to the stormwater drainage system. It may be collected for stock watering or washing down. Stormwater should be diverted away from intensively used stock holding or transfer areas, bulk chemical storage and liquid waste collection areas and treatment and disposal areas. This can be done by roofing or isolating unloading areas, stockyards and processing plant, and/or by building diversion drains and bunding. Contaminated stormwater should be collected in lagoons, aerated and irrigated without any off-site runoff (sections 11 & 12).

11. Wastewater Treatment

The 1995 *Environmental Code of Practice for Meat Premises (Slaughtering)* outlines information on the design of treatment ponds. Ponds should service all contaminated stormwater, wash water and waste water. The design of the ponds should address issues such as the potential for bank erosion, pollutant loading levels, evaporative capacity, sludge removal, pond overflows and achievement of satisfactory levels of organic material breakdown and bacterial disinfection. Microbiological concentrations in outfall water is related to factors such as pond retention time, dilution, water temperature, degree of aeration and the concentration of suspended solids.

Except in exceptional circumstances, ponds must have adequate capacity to prevent overflow and discharge into waterways. Design advice should be sought from suitably qualified engineers.

12. Options for the Disposal of Treated Wastewater

Disposal to sewer

One method for the disposal of waste water is by discharge to municipal sewer. This may require prior treatment of waste water for reductions in nutrient and organic loading. High disinfectant concentrations in wastewater from meat processing premises may also adversely affect the biological processes in wastewater treatment plants and cause poor effluent quality. A Trade Waste Agreement with the relevant local council detailing conditions for treatment of waste water is required prior to acceptance of waste water to a sewerage system. The 1994 document *Guidelines for the Acceptance of Liquid Wastes to Sewers (Sewerage Management Program)* published by DPIWE provides advice on such agreements.

Irrigation to land

Land irrigation of treated effluent is the preferred option where municipal sewerage systems are unavailable and/or site characteristics allow.

The factors governing this "beneficial re-use" approach are described in the draft document *Environmental Guidelines for the use of Recycled Water in Tasmania*. Presently available as a working draft, this document is to be released in 2001 (to replace the 1994 DELM publication *Guidelines for Reuse of Wastewater in Tasmania*). It is intended as a reference for determining environmental objectives and management of all major aspects of wastewater reuse systems in Tasmania. These guidelines provide irrigation design, discharge and operating specifications for the use of wastewater in any effluent reuse scheme or activity.

Recycling of wastewater should be managed to achieve the following environmental and health performance objectives:

- control of recycling operations so as not to pollute ground or surface waters;
- use of organic matter, nutrients, salt and wastewater for sustainable operations; and
- management of wastewater so as not to cause any interference with community health or amenity.

The recycling guidelines detail those factors to consider when evaluating the viability of a proposed reuse scheme. These include:

- the volume and constituents of effluent discharged;
- site water balance – ie. soil type, local drainage, proposed plants/crops, evaporation and annual rainfall;
- capacity for nutrient uptake by soils and plants;
- potential salinity hazards;
- storage requirements during periods where rainfall meets plant needs;
- stormwater management to prevent overland flow of nutrients;
- buffer distances sufficient to ensure activity separated from residential areas (consider future expansion);
- buffer distances to mitigate impacts on nearby terrestrial and aquatic environments.

Monitoring programs are needed to ensure that long-term irrigation re-use does not affect soil and ground water

quality. To ensure that remedial action can be taken early, the following monitoring is recommended – flow (influent and effluent), waste quality (influent and effluent), soil and groundwater.

Valuable information on the environmentally responsible disposal of effluent by irrigation can also be found in the 1995 Meat Research Corporation document *Effluent Irrigation Manual for Meat Processing Plants*.

On-site re-use

Suitably treated wastewater (see section 11) may also be considered for use to irrigate golf courses, gardens and parks; dust suppression on roads; emergency fire fighting or for washing down stock holding yards.

Approved disposal to a watercourse

For meat premises and pet food works the discharge of effluent to surface waters will only be approved in exceptional circumstances. It must be clearly demonstrated to the Board that alternative methods of disposal - discharge to a sewer, on-site re-use or irrigation - are not practical or would result in a higher net environmental risk considering the effluent quality to be discharged.

In these cases it may be possible to arrange a summer or dry season land disposal system coupled with a winter or wet season discharge to surface waters. Restricted discharges should employ disposal of liquid wastes into surface waters during periods of high runoff and stream-flow (i.e. high rainfall periods) on the assumption that dilution ameliorates some detrimental effects of the effluent.

A telephone survey by the Department in October 2000 of all 50 meat premises and pet food works across the state revealed that only four operators used point source discharges to waterways as part of their existing waste water management system.

13. New Sites

Careful consideration needs to be given to the effects of new premises on the existing environment. Changes in land use arising from the need to have sufficient areas for holding paddocks, stabilization ponds and effluent disposal by irrigation have the potential to adversely affect the local community and the natural environment.

The *Environmental Code of Practice for Meat Premises (Slaughtering)* published by the Department in 1995 gives some guidance related to site selection for meat premises. Cattle-holding areas are best located on gently sloping land to avoid ponding and provide a well defined drainage pattern. Land subject to flooding is to be avoided. The draft document *Environmental Guidelines for the use of Recycled Water in Tasmania* details the requirements for liquid waste disposal areas (see section 12).

14. Departmental Contact

These guidelines are also on the DPIWE website - <http://www.dpiwe.tas.gov.au/env/environment.html>. Further information may be obtained by contacting:

**Environmental Policy Section
Environment, Planning and Scientific Services Division
Department of Primary Industries, Water and Environment.
GPO Box 44, HOBART TAS 7001.**

15. References

Agriculture and Resource Management Council of Australia and New Zealand. Report 53: *Australian Standard for Construction of Premises Processing Meat for Human Consumption*. 1995.

Agriculture and Resource Management Council of Australia and New Zealand. Report 54: *Australian Standard for Hygienic Production of Meat for Human Consumption*. 1995.

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Agriculture and Resource Management Council of Australia and New Zealand. Report 58: *Australian Standard for Hygienic Production of Poultry Meat for Human Consumption*. 1995.

Department of Environment and Land Management *Environmental Code of Practice for Meat Premises (Slaughtering)*. 1995.

DPIWE. *Guidelines for the Acceptance of Liquid Wastes to Sewer (Sewerage Management Program)*. June 1994.

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