



RECOMMENDED BUFFER DISTANCES FOR INDUSTRIAL RESIDUAL AIR EMISSIONS

AQ 2/86

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INTRODUCTION

Where sensitive land uses are not sufficiently separated from industries, amenity and quality of life in the adjacent area may be reduced, due to odour, dust or noise emissions, creation of a potential hazard or aesthetically. Because it is not always possible to eliminate impacts on adjacent areas, it is unwise to permit land uses which would be sensitive to such reduced amenity to be located within the affected area.

The Environmental Protection Authority recognised this principle when on 9 March 1977 it adopted "Recommended Buffer Zones for Industrial Residual Air Emissions", which it amended on 24 July 1979 and again on 24 July 1984. The present document is the result of extensive revision following consideration of submissions invited from the public, and adopts a simplified listing system based on the Australian Standard Industrial Classification published by the Australian Bureau of Statistics in 1983.

It must not be assumed that industrial operations will have no adverse impact on amenity beyond the distances nominated in this document. Off-site effects other than reduced amenity of the air environment which may extend over greater distances- for example, noise, vibration, hazard and so on- have not been considered. In such cases a buffer distance greater than that specified in this document may be necessary. Sound planning will take account of all the potential impacts of a development proposal:

The name of the concept has been changed to "buffer distances", the word "zone" being replaced to avoid confusion with the use of the word in a statutory planning context.

Role of Buffer Distances

Regulations under the Environment Protection Act list types of premises for which a waste discharge licence is needed if there are to be routine substantial emissions of waste to air from the premises. Good "in-house" pollution controls can ensure that routine emissions meet State Environment Protection Policy (SEPP) and licence requirements, and are satisfactory dispersed so that SEPP ground level concentration (GLC) objectives are not exceeded at or beyond the site boundary.

However, even with good pollution control technology and practice, there may still be unintended or accidental emissions which must be anticipated and allowed for. While it is an objective of the Authority and the SEPP that such emissions should be eliminated, it is recognised that even "state of the art" technology is not always capable of achieving this goal without fail. Equipment failure, accidents and abnormal weather conditions are among the causes which can lead to amenity reducing emissions affecting properties beyond the boundaries of the source premises. Unlike controlled, routine emissions, these "industrial residual air emissions" (IRAEs) are often intermittent or episodic in occurrence and may originate at or near ground level. Provision of an adequate buffer distance allows the

emissions to dissipate without adverse impacts on sensitive land uses.

While buffer distances are a means of reducing the effects of such residual emissions, they are not an alternative to source control. In preparing this document, the Authority is not condoning uncontrolled off-site air emissions contravention of SEPP requirements. Rather, the document acknowledges the fact that under the circumstances described above, SEPP objectives might not always be met, and consequently some beneficial uses specified in the SEPP might not always be protected in the vicinity of a premises. Responsible planning should take account of real, not just ideal, conditions.

In addition, if a premises has been located on a site with an inadequate buffer distance, subsequent remedial action to alleviate off-site effects either within or beyond the buffer distance will be required of residual emission episodes occur. However, it should be realised that such action may require costly, high technology solutions, which may not be economically feasible or fully effective.

APPLICATION OF THIS DOCUMENT

(I) Land Use.

People who use land in particular ways have expectations of amenity that relate to that use. Residents, for example, expect higher standards of amenity than people at work in an industrial area.

The following simple three-part classification of land uses is proposed to assist in the interpretation and application of IRAE buffer distances.

(a) Land uses which warrant protection from amenity-reducing off-site effects of industry by the maintenance of a buffer distance. In the context of this document, particularly sensitive uses include:

Residential areas and zones (whether occupied or not), hospitals, schools, caravan parks and other similar uses involving the presence of individual people for extended periods, except in

the course of their employment or for recreation.

(b) Land uses which, neither generate significant residual air emissions, nor warrant protection from them. Examples include open space, commercial and business zones, public roads, and industrial operations which meet the "light industry" definition of having no amenity-reducing off-site effects. These land uses are not listed in the present document.

(c) Land uses around which a buffer distance for residual air emissions is required; these uses, and the appropriate buffer distance for each, are listed in the body of this document.

For example:

A residential zone might lie 1000 metres from an industrial plant requiring a buffer distance of 1000 metres. The intervening land may well be occupied by other "category (c)" uses; that is, other industries warranting buffer distances smaller than 1000 metres, provided that they in turn are located sufficiently far away from the residential zone. Closer to the residential area, "category (b)" uses would be appropriate.

Thus the implementation of buffer distances for residual air emissions need not involve industrial land uses being surrounded by wasted hectares of valuable land. Location of activities with substantial buffer distances requirements towards the centre of industrial zones will minimise the extent to which the buffer distance impinges on land outside the zone.

Some industries can be incompatible neighbours- for instance, a chemical works and a food preparation premises. However, the reasons for their incompatibility are often highly individual, needing to be addressed on a case-by-case basis to ensure that sensible planning solutions are reached. Responsible authorities need to ensure that their planning controls are appropriately framed for dealing with the issue. Designation of precincts, dedicated to particular industrial activities,

within industrial zones may be an effective means of preventing further conflicts.

(ii) Receptor-Emitter Considerations.

If IRAE buffer distances are to be implemented effectively, the points between which the distance is to be measured must be clearly understood. At the emitter's (or "inner") end, all plant, buildings or other structures and features- such as stockpiles- from which residual air emissions may be anticipated are the starting point. It may be that the required distances from various installations on a single site are different. At the "outer" end, the critical factor is the property boundary of any sensitive use nearest to the emission source, except in the case of an isolated house in a non-residential zone where the house itself would be the measuring point. If land is zoned for a sensitive use, it should be treated as sensitive regardless of its current use, and the zone boundary should be the measuring point.

Where practicable, the buffer distance should be provided by the emitter; however, this ideal situation will not always be the case. In situations where only part of the area subject to off-site effects is the property of the industrial operator whose activities are creating the effects, the impact on neighbouring landholders may be reduced by careful site layout, with the installation producing the residual emissions located as far as practicable from the nearest "category (a)" land uses. Examination of both the subject land (and its environs) and the relevant planning scheme maps is necessary if the buffer distance requirements of a proposal are to be assessed adequately.

(iii) Other Planning Considerations.

IRAE buffer distances should be implemented taking into considerations the need for preventing sensitive uses encroaching on industry as well as industry encroaching on sensitive uses. Especially when planning new developments- industrial estates, residential estates or any other form of land use- it is necessary to consider the effect that the surroundings will have on the proposed development as well as the effect that the new proposal will have on its surroundings. If a substantial new residential development is

proposed, sewer connection will be necessary and an adequately buffered new site for sewage treatment and effluent disposal should be identified at the earliest possible stage of planning. Surrounding land uses and zones should be carefully assessed to determine their compatibility with the residential proposal.

Land zoned for residential purposes, even though it might currently be vacant grazing land, should be treated as if it is an established residential area. If vacant, industrially zoned land is hemmed in by residential rezoning or development, conflicts are likely to arise in the future and therefore a buffer distance around undeveloped industrial zones should be maintained, the width depending on the nature of the industrial land uses for which the zone has been provided. Uses which are or become non-conforming retain a need for adequate buffer distances.

Proposals to expand or intensify existing land uses which fall into category "a" above, and which are located within the recommended IRAE buffer distance of an existing category "c" activity, should be subject to planning permit under the planning scheme. Such permits should not be issued without consultation with EPA. New developments of land uses falling into either category "a" or category "c" which will not meet the IRAE buffer distances recommended in this document due to existing development or zoning in the vicinity should not proceed unless site-specific variation of the recommended distance is approved by EPA.

The following list of selected industries is structured according to the order and categories used in the Australian Standard Industrial Classification, published by the Australian Bureau of Statistics in 1983.

The IRAE buffer distances recommended in the list are based on overseas and local experience, on the assumption of good practice. If site-specific circumstances seem to indicate a reason for departing from the recommended distance, the advice of the Environment Protection Authority should be obtained.

As a guide, the following criteria should be satisfied before detailed consideration is given

to site-specific variation of a guideline distance listed in this document.

(a) The plant has a standard of emission control technology significantly better than the good level of control assumed in the preparation of this document. Best Available Technology would normally be necessary.

(b) An environmental audit of residual emissions has been completed.

(c) There is no history of complaints arising from residual emissions (in the case of an existing plant).

(d) The plant is significantly larger or smaller than those on which the recommended distance is based, to an extent which will substantially affect residual emissions performance.

(e) There are exceptional topographic or meteorological characteristics which will affect dispersion of residual air emissions.

Satisfaction of these criteria will be a prerequisite for considering site-specific variation of the recommended distance; but does not guarantee that a difference distance will be determined. Additional information will be required, in most cases including sufficiently detailed data to enable dispersion modelling. Objective procedures for determining site-specific IRAE buffer distances for individual operations are being investigated by EPA, and will be made available as soon as possible. The onus will be on the party seeking variation of the recommended distance to demonstrate clearly that that distance is inappropriate for the particular situation.

INDEX OF INDUSTRY CATEGORIES

Agriculture

Mining and Extractive Industry

Manufacturing:

Food, Beverages and Tobacco

Textiles

Wood, Wood Products and Furniture

Paper and Paper Products

Chemical, Petroleum and Coal Products

Non-metallic Mineral Products

Basic Metal Products

Fabricated Metal Products

Miscellaneous Manufacturing

Electricity, Gas, Water and Sewerage

Transport, Storage and Waste Treatment/Disposal

Recreation, Personal and Other Services

Notes:

1- Piggeries

2- Unspecified distances

3- Chemical industries

4- Landfills

5- Sewage treatment and disposal

INDUSTRY	Buffer Distance (metres)
Agriculture	
Poultry: (a) for meat	500
(b) for eggs	400
Piggery:	See Note 1
Feedlot: (a) for dairy or beef cattle	5,000
(b) for other livestock	See Note 2
Stock saleyards:	500
Greenhouses/Hothouses:	
(a) using manure	100
(b) using refuse	300
Mushroom production:	See Note 2
Composting:	500
Mining and Extractive Industry	
Open cut mining:	
(a) for coal	1,000
(b) for other minerals	500
Extraction of:	
(a) natural gas	1,000
(b) crude oil of low sulphur content	300
Quarrying of:	
(a) hard rock with blasting	500
(b) material other than hard rock with blasting	300
(c) any material without blasting	200
Manufacturing, Food, Beverages & Tobacco	
Abattoirs:	500
Smallgoods:	100
Milk products:	100
Vegetable oils and fats using solvents:	300
Flour mills:	300
Bakeries:	100

INDUSTRY	Buffer Distance (metres)
Manufacturing	
Food, Beverages & Tobacco	
Seafood processors:	500
Maltworks:	300
Tobacco and cigarette factories:	500
Other food or beverage products:	See Note 2
Textiles	
Dyeing or finishing of cotton, linen and woollen yarns and textiles:	300
Carpet backing with latex:	300
Production of artificial fibres and textiles:	
(a) cellulose nitrate or viscose fibre, cellophane or artificial rubber	1,000
(b) other synthetic fibres and textiles	500
Treatment or production of textiles:	
(a) using carbon disulphide	500
(b) using other substances	See note 2
Rope, cordage and twine:	100
Wool scouring:	200
Wood, Wood Products & Furniture	
Sawmills:	300
Charcoal:	
(a) by the retort process	500
(b) other than by the retort process	1,000
Wood preservation plants:	100
Wood-fibre or wood-chip products:	300
Joineries:	100
Paper & Paper Products	
Paper or paper pulp:	
(a) involving combustion of sulphur or sulphur containing materials	5,000
(b) from semi-processed materials	100
(c) from prepared cellulose & rags	200
(d) by other methods	See Note 2

INDUSTRY	Buffer Distance (metres)
Chemical, Petroleum & Coal Products	(See Note 3)
Chemical Fertilisers:	1,000
Industrial gases:	1,000
Polyester resins:	1,000
Other synthetic resins & rubber:	1,000
Ammunition, explosives and fireworks:	1,000
Formaldehyde production:	300
Paints and inks:	
(a) manufacture	1,000
(b) blending and mixing only	300
Pharmaceutical and veterinary products:	1,000
Biocides:	1,000
Soap and other detergents:	300
Cosmetics and toilet preparations:	100
Inks:	300
Petroleum refineries:	2,000
Briquettes:	300
Other petroleum or coal products:	500
Other organic industrial chemicals:	1,000
Other inorganic industrial chemicals	1,000
Other chemical products:	300
Non-metallic Mineral Products	
Glass and glass products including glass wool:	500
Rock wool manufacture	500

INDUSTRY

Buffer Distances (metres)

Non-metallic Mineral Products

Bricks, tiles, pipes, refractories, etc with an annual design production rate exceeding 10,000 tonnes per annum:	200
Cement in amounts:	
(a) up to 5,000 tonnes per year	300
(b) between 5,000 & 150,000 tonnes per year	500
(c) exceeding 150,000 tonnes per year	1,000
Concrete batching plants:	100
Bitumen batching plants:	500
Concrete or stone articles:	100
Plaster products:	100
Basic Metal Products	
Iron and steel production in amounts:	
(a) up to 1,000,000 tonnes per year	500
(b) exceeding 1,000,000 tonnes per year	1,000
Production of non-ferrous metals:	
(a) aluminium by electrolysis	2,000
(b) other non-ferrous metals in amounts:	
(i) up to 100 tonnes per year	100
(ii) between 100 & 2,000 tonnes per year	300
(iii) exceeding 2,000 tonnes per year	500
Fabricated Metal Products	
Structural or sheet metal products:	500
Iron and steel products in amounts:	
(a) up to 1,000,000 tonnes per year	500
(b) exceeding 1,000,000 tonnes per year	1,000
Boilers:	100
Abrasive blast cleaning:	See Note 2

INDUSTRY	Buffer Distances (metres)
Miscellaneous Manufacturing	See Note 3
Rendering and castings works:	1,000
Leather tanning and dressing:	300
Leather and artificial leather goods:	300
Rubber products, using either organic solvents or carbon black:	300
Fibreglass manufacturing:	200
Printing and coating works with heated curing ovens:	500
Electricity Gas and Water	
Gas distribution works for mains supply:	300
Gas odorising with mercaptans:	1,000
Sewerage works:	See Note 5
Transport and Storage	
Storage of petroleum products and crude oil in tanks exceeding 2,000 tonnes capacity:	
(a) with fixed roofs	300
(b) with floating roofs	100
Grain elevators:	300
Storage of wet-salted or unprocessed hides:	300
Warehousing of bulk volatile organic compounds in quantities greater than 1,000 tonnes:	1,000
Sanitary and garbage disposal services:	
(a) Landfills	See note 4
(b) Recycling and composting centres	200
(c) Transfer stations	300
(d) Depots for refuse collection vehicles	100
Temporary storage of industrial wastes:	300
Treatment of aqueous waste:	200
Treatment of organic waste:	500

INDUSTRY	Buffer Distances (metres)
Transport and Storage	
Waste incinerator:	
(a) for woodwaste	300
(b) for plastic or rubber waste	500
(c) for chemical, biomedical or organic waste	See Note 2

Recreation, Personal & Other Services

Industrial dry cleaners:	100
Crematoria:	300

NOTES

1. The buffer distance for any piggery should be determined in consultation with EPA. For piggeries with less than 5,000 pigs the distance calculated in accordance with the procedure set out in the Health Department Victoria publication Code of Practice- Piggeries may be used as a guide.
2. The buffer distance for any existing or proposed establishment in this category will be determined by EPA, on a site-specific basis.
3. The listed buffer distances apply to the larger operations in this category. Consultation with EPA is recommended.
4. The buffer distance for any landfill operation should be calculated in accordance with the procedure set out in the State Environment Protection Policy- Landfills (when gazetted).
5. The buffer distance for sewage treatment or effluent disposal works should be determined in consultation with EPA. Wind regimes, topography, waste-loading, treatment/disposal methods and design capacity should be taken into account. The following Table may be used as a guide when considering proposals for residential developments in the vicinity of existing sewage treatment works.

TABLE TO NOTE 5:

BUFFER DISTANCES FOR SEWERAGE WORKS (IN METRES)

Type of installation	Installation treatment capacity (equivalent population)			
	<1000	<5000	<20000	<50000
Mechanical/Biological wastewater plants	100	200	300	400
Aerobic pondage systems	150	350	700	1000
Facultative ponds	300	700	1400	2200
Disposal areas for secondary treated effluent:				
(a) by spray irrigation	200m	200m	200m	200m
(b) by flood irrigation	50m	50m	50m	50m



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