

## BUNDING GUIDELINES

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### OBJECTIVES

To protect the environment by providing a secondary containment system, for liquids which if spilt are likely to cause pollution or pose an environmental hazard.

The guidelines specifically apply to above ground storage and transfer areas.

It should be noted that almost all liquids may cause pollution or pose an environmental hazard if released and so this guideline is applicable.

Further, many such liquids may also be classified as dangerous goods. When this is so, the relevant requirements of the *Dangerous Goods (Storage and Handling) Regulations 2000* – Statutory Rule No. 127/2000, and *Australian Standard 1940 – The Storage and Handling of Flammable and Combustible Liquids* must be used.

### DEFINITIONS

**Pollution** – of water or land is to adversely change its physical, chemical or biological condition, by the discharge or deposit of wastes, as fully defined in the *Environment Protection Act 1970*, Sections 39 and 45.

**Environmental Hazard** – a liquid which may cause a state of danger to human beings or the environment whether imminent or otherwise resulting from its location, storage and handling, having toxic, corrosive, flammable, explosive, infectious or otherwise dangerous characteristics.

**Dangerous Goods** – substances and items as referred to in the *Dangerous Goods (Storage and Handling) Regulations 2000* – Statutory Rule No. 127/2000.

**Notifiable Chemical** – a prescribed or declared chemical for which the EPA has certified that there is no satisfactory facility for destruction or disposal in Victoria, or the nature of the chemical is such that the location, storage and handling may pose an environmental hazard.

**Prescribed Wastes** – wastes listed in the *Environment Protection (Prescribed Waste) Regulations*.

**Undercover Area** – an area roofed and walled so as to prevent ingress of rainwater.

**Used Empty Drum** – a drum containing a residue, of less than 1% by volume of the volume of the drum.

**Bund** – strictly refers to the wall of a secondary containment system; however, it is commonly used in reference to the whole system (refer to diagram on back page).

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## BUND CONSTRUCTION

The following are intended to ensure the integrity of the bund.

**Materials** – floor slabs and bund walls, must be impervious to, and compatible with, the liquids to be contained. Concrete is recommended as it is robust and generally impervious; however, it should be of a standard, or provided with a coating (eg acid resistant), that ensures that it is impervious during service.

For large tank farms, impervious proprietary liner systems may be used with the written approval of the EPA. In such cases, its permeability shall not be more than  $10^{-9}$ m/s for the liquid to be contained. Also it must be installed and maintained in accordance with the manufacturers specifications.

**Joints** – concrete bunds should be poured integrally with the slab. When joints are used in concrete or masonry systems, they should be sealed with a suitable sealant material, that is impervious to, and compatible with, the liquids to be contained.

**Pipes** – may be installed through the bund or floor if it is essential, provided that the junctions are sealed with a suitable sealant material, that is impervious to, and compatible with, the liquids to be contained.

**Vehicles** – where access is required into a bunded area, ramps or roll-over bunds should be used to maintain effective bund height.

**Drainage** – the floor should be graded and drained to a pit to enable collection, with a normally closed and locked isolation valve provided. The operation of any valve or pump should be manually controlled and clearly labelled.

## STORAGE

**Different Liquids** – Where two or more liquids are stored on site, they should be stored such that:

- \* separate bunded areas are provided where possible for each liquid to maximise collection and re-use of uncontaminated spilled liquid;
- \* minimum separation distances for storage vessels containing chemicals belonging to different classes of dangerous goods, as set out in the *Dangerous Goods (Storage and Handling) Regulations 2000*, are strictly adhered to.

**Half Height Rule** – Tanks and drums should be separated from the inner edge of the bund crest by a distance of half the height of the tanks or stack of drums on flat ground.

The above half-height rule may be waived where adequate restraint is provided to prevent drums from falling outside the bund, such as a cyclone wire fence or a wall.

**Minor Storage** – For sites where only a few drums are to be stored, say less than 1200 litres, it is generally satisfactory to provide alternatives to a bund. The drums should be stored such that:

- \* recovery of spilt material is possible;
- \* they are undercover and on an impervious base;
- \* they are away from stormwater drains and pits;
- \* good operational procedures are used; and
- \* absorbent is on hand.

## BUND HEIGHT

**Tanks** – The gross capacity of a bunded area should be sufficient to hold at least 100% of the capacity of the largest tank, plus 10% of the capacity of the second largest tank, plus any other major displaced volumes below the bund crest, including other tanks and raised foundations.

**Drums** – The gross capacity of a bunded area should be sufficient to hold at least the volume of 25% of the (maximum design number of) drums to be stored up to 10kL, plus 10% of any volume in excess thereof.

If used empty drums are stored with other drums, then the bund should be provided with a height which assumes all drums to be full.

**Tank Vehicle Loading** – The capacity of a bunded area should at least equal the greater of:

- \* 100% of the largest compartment of any tank vehicle using the filling facility or 9000 L, whichever is less; or
- \* the maximum quantity capable of being discharged from the two filling points having the greatest flow during a period of two minutes.

**Potentially Contaminated Areas** – Areas designated for used drum storage or crushing, manifolds, pump stands and materials transfer should be controlled in accordance with this guideline.

**Stormwater Allowance** – Areas required to be bunded or controlled and which are not considered to be under cover, should be provided with a minimum bund height of 150mm.

For example, for outdoor storage, transfer and potentially contaminated areas the bund should be at least 150mm high, even though the calculated height

based upon the above criteria may be less than 150mm.

**Fire Water Allowance** – Where an automatic fire sprinkler system is installed in or over any bunded tank or drum storage compound, the capacity provided should be increased by a volume equal to the output of the sprinkler system over a period of at least twenty minutes. In addition, provision should be made for containment of fire water on site by the design and construction of adequate drainage controls and formulation of appropriate contingency plans.

## STORMWATER CONTROL

The preferred approach is that a bunded area be located undercover. However, where this is not practicable, the treatment and/or disposal of stormwater collected in bunded areas should be determined on a site specific basis in consultation with an authorised EPA officer, in particular the following points should be considered.

Bunds should be provided with facilities to transfer accumulated stormwater to:

- \* the sewer (subject to approval of the local sewerage authority);
- \* storage prior to disposal to a site licensed by the EPA to accept this waste; or
- \* the stormwater drainage system, subject to written approval of the EPA, typically including discharge licence requirements for on-site primary treatment.

In some cases, it may be possible to incorporate a two way valve system which will allow all contaminated

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stormwater to be discharged to the sewerage system (subject to approval of the local sewerage authority).

## MAINTENANCE AND OPERATION

Procedures should be in place which ensure that:

- \* additional bunds are installed as needed;
- \* the integrity of existing bunds is maintained;
- \* ponding of collected stormwater should be minimised by regular disposal;
- \* spills are cleaned up immediately, with the necessary equipment and adsorbent kept on hand; and
- \* where filling occurs, overfill controls should be installed.

## GENERAL CONSIDERATIONS

**Design** – Alternative combinations of bunds, floors, cut-off drains, pits and tanks, may be used to comply with the requirements of this guideline. Such combinations would be especially relevant where existing installations are inadequately bunded. In all

cases the written approval of the EPA should be obtained prior to the commencement of works.

**Spread of Contaminants** – Vehicles should not be allowed to spread contaminants out of a bunded area on its wheels. This can be controlled by having a high standard of housekeeping.

## REFERENCES

*Dangerous Goods (Storage and Handling) Regulations 2000* – Statutory Rule No. 127/2000.

Australian Standard 1940 (1988) – *The Storage and Handling of Flammable and Combustible Liquids (SAA)*.

These GUIDELINES have been documented in order to provide a summary of issues and assistance in understanding EPA requirements. They are for guidance only and are not intended to be either prescriptive or exhaustive. Each situation will be assessed by the EPA according to its own merits.

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## EXAMPLE OF BUNDED AREA

(For illustration purposes only)

