

Calculation of financial assurance for landfills, prescribed industrial waste management (PIW) and container washing



Environment
Protection
Authority Victoria

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Guideline

Purpose

This guideline provides information to assist duty holders in the calculation of the financial assurance required as a condition of a licence or a works approval for landfills, prescribed industrial waste (PIW) management, container washing and PIW composting scheduled activities.

Legal status

Under section 67B of the *Environment Protection Act 1970* (the Act), Environment Protection Authority Victoria (EPA) may require duty holders to provide financial assurance as a condition of a licence or works approval. EPA will determine the amount of financial assurance in accordance with this guideline unless the duty holder demonstrates that a different calculation of financial assurance is appropriate. A different calculation would only be applicable in exceptional circumstances.

Financial assurance for licences and works approvals (publication 1594) explains how EPA applies financial assurance.

Types of financial assurance (publication 1595) gives an overview of types of financial assurance that EPA may consider and when each type of financial assurance may be considered appropriate.

Introduction

EPA's financial assurance system is intended to prevent cleanup costs being borne by the Victorian community.

EPA requires duty holders operating certain scheduled premises to provide financial assurance. Under the Act, this requirement can be specified in a works approval, licence, pollution abatement notice or a waste transport permit. The types of scheduled premises that may be required to submit a financial assurance are specified in Schedule 1 of the Environment Protection (Scheduled Premises) Regulations 2017.

This document provides guidance on how to determine the amount of financial assurance for:

- landfills
- prescribed industrial waste (PIW) management
- container washing
- organic waste processing (composting) of PIW.

In the event that a premises, at which one or more of the above activities are undertaken, is deemed by EPA to present significant or unique risks, a tailored financial assurance calculation may be required.

This guideline does not address calculation of financial assurance for:

- bulk storage
- contaminated sites – onsite soil containment
- ash ponds
- Type 1 landfills – landfills accepting PIW (Category B).

Financial assurance in each of these instances is determined in consultation with EPA.

Landfills

Financial assurance for landfills consists of two 'components':

- operational
- closure and aftercare.

The documents that are required to support the calculation of financial assurance for landfills are:

- a map showing all the cells at the site identifying the current cell(s), cells with intermediate capping, partially rehabilitated cells, and/or fully rehabilitated cells including the dates of rehabilitation and approved cell volumes for each cell

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- the audit report identification numbers for audit reports containing as-constructed details of landfill cells (i.e. cell designs), identifying cells constructed to the requirements specified in the most recent version of *Best practice environmental management: Siting, design, operation and rehabilitation of landfills* (the Landfill BPEM; publication 788)
- the audit report identification number for the most recent audit report that verifies the area of the landfill that has already been filled and the area that is proposed to be filled
- a list of approved variations to BPEM requirements for future capping
- where a Type 3 cap is proposed, evidence supporting that this type of cap is appropriate (e.g. evidence of classification of the waste as industrial waste)
- the audit report identification numbers for reports containing auditor verification of capping and rehabilitation of cells closed after 2011
- the most recent rehabilitation plan
- any evidence supporting a variation to the default 30-year aftercare period (used for calculation purposes).

Landfill operational financial assurance

Landfill operational financial assurance is intended to fund the costs that may be incurred by EPA in the caretaking of a landfill in the event it is abandoned, or an uninsured event exceeds the operator's capacity to pay, before the landfill enters the post-closure phase.

The events covered by the financial assurance are uncertain but can be significant. It is therefore not possible to accurately describe or calculate the costs of all contingent events. EPA has instead derived a formula to calculate the required landfill operational financial assurance.

The formula is based on the approved volume of filled cells that are not fully rehabilitated, plus the volume of approved cells (recorded on the current licence) that are not yet filled. The approved volume of cells represents the scale of the activity at the site and the potential environmental risk.

The volume used in the formula is cubic metres.

The formula is:

$$\begin{array}{l} \text{Operational} \\ \text{financial} \\ \text{assurance} \end{array} = \$0.45/\text{m}^3 \times \text{total cell} \\ \text{volume (filled plus} \\ \text{approved)} \\ + \$135,000$$

The formula was derived using estimated remediation costs for the following types of events at variably sized landfills:

- loss of leachate containment
- generation of excess leachate
- illegal dumping
- slumping of batters
- failure or erosion of temporary capping or vegetation
- gas migration.

It is assumed that contingent events do not occur simultaneously. These events were selected as being representative of a wide variety of contingent events at landfills that could result in unexpected costs.

The formula is based on 2015 costs and shall be indexed using the Consumer Price Index (CPI) adjustment calculation below for financial assurance calculations performed in subsequent years.

A cell is not required to maintain the operational component of financial assurance if it meets the following requirements:

- the cell is fully rehabilitated with a final revegetated cap. A cell is not considered to be fully rehabilitated if any portion of the cell has only intermediate capping or partially constructed side wall. Final capping includes proven phytocapping where phytocapping is used.
- landfill gas and leachate management infrastructure and surface water management engineering controls installed and operating
- all licence conditions (and any relevant notice conditions) with respect to leachate and gas management are being complied with for that cell.

An environmental auditor verification that the cell complies with all of the above requirements must be provided (or approval in writing by EPA that the cell is fully capped prior to 2011).

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Landfill closure and aftercare financial assurance

The calculation of the closure and aftercare financial assurance should address the costs of complying with the most recent version of Landfill BPEM (publication 788), *Closed landfill guideline* (publication 1490), and *Landfill licensing guideline* (publication 1323).

The calculation should be assessed by an environmental auditor, appointed pursuant to the *Environment Protection Act 1970*, in accordance with the *Landfill financial assurance auditor assessment form* (form F1014).

The closure and aftercare financial assurance should address the cost of the following activities at a minimum:

Closure financial assurance cost to include:

- capping of the uncapped area and any area with temporary or intermediate capping, as well as any additional works on existing caps as specified in the rehabilitation plan (including material costs as well as installation of the materials)
- haulage and purchase of capping material if the latter is not available onsite
- vegetation establishment and management
- implementation of stormwater management control structures
- final gas and leachate management infrastructure installation
- decommissioning and removal of redundant operational infrastructure
- hydrogeological assessment and/or review and update of the hydrogeological assessment¹
- landfill gas risk assessment and/or review and update of the landfill gas risk assessment
- environmental monitoring program²

- rehabilitation plan for the remaining rehabilitation work required
- development of an aftercare management plan³
- auditor assessment of cap and leachate dam
- audit of construction of the cap including final rehabilitation
- auditing of the leachate dam design and construction (if required)
- management supervision, preliminaries and on-costs.

Any area that has been signed off by an auditor as fully capped and rehabilitated (or approved in writing by EPA as fully capped prior to 2011) does not need to be included in the closure calculation. For the closure component to be released, an auditor must verify that all rehabilitation activities are completed. Final capping includes proven phytocapping where phytocapping is used.

In areas where clay is not available for capping, the calculation should incorporate the cost of purchasing and hauling clay unless an alternative capping design is approved by EPA.

Where the final capping design has not yet been approved by EPA, the capping design used as a basis for calculating financial assurance should be as follows.

If the licence specified a capping standard at the date of cell completion, this standard will apply. Otherwise, the standard at the time of closure applies.

For closures after 2001, the standard at the time is a BPEM-compliant cap design. At present, a cap design prepared in accordance with licence conditions L22, L25 and L26 (refer to *Landfill licensing guideline* [publication 1323]) is the standard that applies.

¹ The cost of a hydrogeological assessment is not required where all cells onsite are fully engineered to the standard in the most recent version of the Landfill BPEM.

² The cost of establishing an environmental monitoring program is not required in the closure and aftercare financial assurance estimate if

this program is already in place in accordance with *Landfill licensing guideline* (publication 1323).

³ The cost of preparing a rehabilitation plan and an aftercare management plan is not required in the closure and aftercare financial assurance estimate if the documents are already in place in accordance with the Landfill BPEM.

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Aftercare cost to include:

- operation and maintenance of all structures including capping (and vegetation), wells and bores, and associated pipework
- capping and vegetation maintenance/augmentation for phytocaps
- leachate extraction/collection, treatment and disposal
- landfill gas extraction and treatment
- environmental monitoring
- infrastructure and leachate pond decommissioning (at the conclusion of the aftercare period)
- inspection, audit and annual reporting costs
- stormwater management and surface water monitoring.

Aftercare calculation principles:

AREA: Use the total area of the landfill – the filled area plus the currently approved area.

If this area cannot be determined from audit reports, use the default area specified in Schedule 1 of the licence.

TIME: Use an aftercare period of 30 years from the final closure date of the entire site.

A different aftercare period can be used only where sufficient evidence is provided with the calculation proposal.

ACCOUNTING: Neither discounting nor inflation should be applied. Adjustments for inflation are included in the periodic re-evaluation of financial assurance amounts.

If an accumulating, interest-bearing fund is used to provide for closure and aftercare costs, discounting can be incorporated into the determination of pay-in schedules.

Progressive release of the closure and aftercare financial assurance

The financial assurance for closure and aftercare can be reduced to remove the costs associated with closure upon auditor verification that the closure activities are completed.

EPA has sole discretion about the release of financial assurance. Progressive release of aftercare financial assurance during the aftercare period is most likely to be based on a risk-based calculation that considers the remaining environmental risks at the site.

EPA requires the following four criteria to all be met before making any consideration of progressively reducing the aftercare financial assurance:

1. Evidence is available of progress in actioning all environmental auditor recommendations relating to managing the risk to the environment.
2. No additional remedial notices or sanctions have been applied in the previous five years.
3. The most recent environmental audit report confirms that the risks to the environment associated with aftercare management are being adequately identified, managed and monitored.
4. Costs to date have been aligned with expected expenditure and therefore the financial assurance for the remaining aftercare period can be reduced accordingly.

The entire closure and aftercare financial assurance is released once EPA determines that the site no longer poses a risk to human health or the environment.

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PIW management and container washing

The financial assurance for PIW management and container washing facilities consists of a cost calculation for PIW disposal, based on the amount of PIW that is permitted to be stored on the site. Financial assurance for organic waste processing (composting) of PIW is addressed below, separately.

Calculation of financial assurance associated with site contamination is not addressed within this guideline. Financial assurance for site contamination is addressed through pollution abatement notices when contamination is suspected or found at the site and is calculated in consultation with EPA.

PIW disposal costs

The PIW disposal cost is calculated by multiplying the total amount of PIW the facility is permitted to store by the relevant PIW unit disposal cost.

PIW disposal cost = amount of PIW x unit disposal cost

where:

amount of PIW = maximum amount of PIW the facility is licensed to store (m³, tonnes or 1000L)

unit disposal cost = the highest unit disposal cost that is associated with the range of PIW permitted to be stored on the site

Unit disposal costs are provided in Table 1, 2, 3 and 4. A default rate of \$1,000 per tonne or cubic metre applies for all other waste types not otherwise specified.

The costs are quoted in 2015 and shall be indexed in subsequent years using the CPI adjustment formula outlined at the end of this document.

Where the facility is licensed to store a number of different wastes, the unit disposal cost is based on the PIW with the highest disposal cost.

To minimise financial assurance costs, licence holders can apply to vary their licence to specify separate waste limits for high-cost wastes. The financial assurance is then calculated by totalling the waste disposal costs for the permitted amount of each waste.

A separate calculation of the costs of transport, sampling and site management is not required. The waste disposal costs used in the financial assurance calculation are designed to include these additional costs and are therefore set deliberately higher than commonly charged gate fees.

Table 1: Waste disposal costs for high-cost wastes

Waste type	Waste code	Unit disposal cost (2015 dollars)
PCBs or material contaminated with PCB >50mg/kg	M100	\$20,000 per tonne or m ³
Highly odorous organic chemicals (including mercaptans)	M260	
Equipment containing PCBs	M110	\$10,000 per tonne or m ³
Mercury waste	D120 D121	\$3,000 per tonne or m ³
Chlorinated or halogenated waste	G130, G150	\$2,000 per tonne or m ³
Isocyanate	M220	
Cyanide waste	A100	\$1,500 per tonne or m ³
Pesticides	H100, H110, H160	\$1,500 per tonne or m ³

A default rate of \$1,000 per tonne or cubic metre applies for all waste types not specified in Tables 1, 2, 3 and 4.

Where the facility is licensed to store multiple low-cost PIW, the unit disposal cost is based on the PIW with the highest disposal cost.

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Table 2: Waste disposal costs for low-cost PIW

Waste type	Waste code	Unit disposal cost (2015 dollars)
Oils, hydrocarbons, emulsions	J codes	\$500 per tonne or m ³
Inert sludges	T130	
Residues	N210	
Industrial washwaters	L codes	\$250 per tonne or m ³
Putrescible/organic wastes	K codes	\$100 per tonne or m ³

For premises where containers are stored and no other PIW is permitted, or where a separate storage limit for containers is specified, the unit disposal costs in Table 3 apply. If the container storage limit is expressed in weight, the disposal cost relates to the weight of the containers as well as PIW trace residues.

Table 3: Waste disposal costs for containers

Waste type	Waste code	Unit disposal cost (2015 dollars)
Containers	N100	\$20 each or \$2/kg
	N105	\$50 each or \$1/kg

EPA may determine a lower amount of financial assurance is required if it is satisfied that customer storage agreements are in place that specify that containers are to be returned to their owners, and the licence is amended to require the storage agreements to be in place.

For premises where soil is permitted to be stored and treated and/or where passive remediation of contaminated soil is permitted, a soil treatment cost may be used to calculate financial assurance as specified in Table 4. For very large quantities, a lower rate may apply. A separate storage limit for Category A, B and/or C contaminated soil must be specified in the licence.

Table 4: Treatment costs for contaminated soils

Permitted soil type	Waste code	Treatment cost (2015 dollars)
Category A	N119	\$850 per tonne or m ³
Category B	N120	\$450 per tonne or m ³
Category C	N121	\$180 per tonne or m ³

EPA may determine that a lower amount of financial assurance is required if it is satisfied that:

- customer storage agreements are in place for contaminated soil under treatment that specify the soil is to be returned to the soil producer, and
- the licence is amended to require the storage agreements to be in place.

Organic waste processing (composting) of PIW

The following financial assurance calculation guideline is intended for the subset of PIW managers that undertake organic waste processing (composting) of PIW.

Calculation of financial assurance for these is based on the cost of offsite disposal of the PIW or PIW-contaminated wastes.

There are two 'components' of financial assurance that are potentially relevant to PIW organic waste processors (composters):

- PIW storage – for premises where PIW is permitted to be stored.
- PIW mixing – for premises where there is an area or pit for mixing PIW with other materials.

The total financial assurance is calculated by adding the financial assurance components that are relevant to the premises.

PIW storage

The PIW storage component is applicable where a PIW storage limit is specified in the licence. This component of financial assurance is calculated in the same manner as for PIW Management (see previous section).

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PIW mixing

The PIW mixing component is applicable to sites where a mixing area or pit(s) is designated in the licence. This component is calculated by multiplying the volume of the mixing pit(s) by the waste disposal costs for the most expensive waste type that is permitted to be mixed into the organic waste for processing (composting).

Calculating a Consumer Price Index adjustment for the financial assurance

CPI means the Consumer Price Index (All Groups Index) issued by the Australian Statistician for Melbourne.

The following formula is used when calculating the financial assurance subsequent to 2015 (including adjustments at EPA's request or before any licence is transferred).

$$N = E \times \left(1 + \left(\frac{A - B}{B} \right) \right)$$

where:

N is the updated financial assurance calculation

E is the financial assurance calculated in 2015 dollars

A is the CPI number for the previous December quarter of the year that the calculation is being performed

B is the CPI number for the December quarter of 2015

Further information

EPA publications and forms are available on our website: epa.vic.gov.au/publications

For more information call 1300 372 842 (1300 EPA VIC) or email contact@epa.vic.gov.au