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EPA acknowledges Aboriginal people as the first peoples and Traditional custodians of the land and water on which we live, work and depend. We pay respect to Aboriginal Elders, past and present.

As Victoria's environmental regulator, we pay respect to how Country has been protected and cared for by Aboriginal people over many tens of thousands of years.

We acknowledge the unique spiritual and cultural significance of land, water and all that is in the environment to Traditional Owners, and recognise their continuing connection to, and aspirations for Country.



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Purpose

This guide sets out Environment Protection Authority (EPA) Victoria's method for calculating the amount of financial assurance that may be required as a condition of a development licence, operating licence or permit under the *Environment Protection Act* 2017 (the Act), for:

- landfills
- reportable priority waste management (RPW)
- waste and resource recovery facilities (WRRF)

Read more about financial assurance:

- *Financial assurance for permissions and contaminated land management* (publication 2002) (https://www.epa.vic.gov.au/about-epa/publications/2002) explains the laws and requirements for financial assurance.
- <u>Form of financial assurance</u> (publication 1595) (https://www.epa.vic.gov.au/aboutepa/publications/1595-2) provides an overview of the different forms of financial assurance that EPA may consider and in what circumstances.
- EPA's website provides information about financial assurances and the risk assessment criteria <u>epa.vic.gov.au</u>

Introduction

Financial assurance was introduced to Victoria's environment protection legislation following several incidents where EPA conducted cleanup following business failures, waste abandonment and pollution events. Financial assurance ensures that in the event remediation or cleanup is required, funds are available.

From 1 July 2021, EPA may require financial assurance as a condition of a prescribed permission, environmental action notice (EAN), site management order (SMO) or an Order relating to environmentally hazardous substances (section 219(1) of the Act).

Prescribed permission activities

The activities from Schedule 1 of the Environment Protection Regulations 2021 (the Regulations) that may be required to provide a financial assurance as a condition of a permission, are set out in regulation 167. They are:

- a) Reportable priority waste management (A01)
- b) Landfills excluding municipal landfills servicing <5000 people (A05a)
- c) Waste and resource recovery large (A13a)
- d) Waste and resource recovery medium (A13b)
- e) Bulk storage (G04)
- f) Contaminated sites on-site soil retention (L02).

Calculation methods covered in this guide

This guide provides EPA's method for calculating financial assurance for permissions related to landfills, reportable priority waste management and waste and resource recovery facilities.

Financial

assurance for other activities is determined by EPA in consultation with the duty holder.

Risk assessment criteria

To determine if a financial assurance is required for a prescribed permission, and the appropriate form of the financial assurance, EPA will apply the risk assessment criteria set out in regulation 168. Read more about the risk assessment criteria in <u>Financial assurance for</u> <u>permissions and contaminated land management</u> (publication 2002) (https://www.epa.vic.gov.au/about-epa/publications/2002) and on EPA's website.

Determining the amount of financial assurance

In determining the amount of financial assurance, EPA will have regard to the factors set out in section 221 of the Act. These are:

- a reasonable estimate of costs and expenses of remediation or cleanup activities
- any method for calculating the amount of financial assurance that EPA publishes
- an independent assessment of the amount of financial assurance, if required by EPA under section 222 of the Act.

This guide constitutes methods published by EPA for calculating the amount of financial assurance.

EPA will determine the amount of financial assurance for landfills, reportable priority waste management and waste and resource recovery facilities in accordance with this guide unless:

- EPA determines that a tailored financial assurance calculation is required to better estimate the costs and expenses of remediation or clean up associated with the activity or type of waste managed at the site; or
- the duty holder can sufficiently demonstrate to EPA that a different calculation method is appropriate. A different method would only be applicable in exceptional circumstances.

Financial assurance for activities not covered in this guide is determined by EPA in consultation with the duty holder.

Calculating financial assurance for landfills

Calculation of financial assurance for landfills has three components:

- operational
- closure
- aftercare.

Assessment by an environmental auditor

EPA requires an independent assessment of the amount of financial assurance for landfills to be provided by an environmental auditor, appointed under the Act.

Find more information about auditor assessment of landfill financial assurance proposals, and the assessment form <u>Landfill financial assurance auditor assessment form</u> (F1014) (https://www.epa.vic.gov.au/about-epa/publications/f1014).

Documentation for calculation of financial assurance

Table 1 lists the documents required to support the calculation for financial assurance for landfills.

Table 1: Documents for landfill financial assurance

Document description

A map of the landfill showing all the cells at the site that identifies 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.

The audit report identification numbers for audit reports containing as-constructed details of landfill cells (cell designs), identifying cells constructed to the requirements specified in <u>Siting, design</u>, <u>operation and rehabilitation of landfills</u> (publication 788) (https://www.epa.vic.gov.au/about-epa/publications/788-3).

The audit report identification number for the most recent audit report 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 requirements for capping set out in <u>Siting, design, operation and</u> <u>rehabilitation of landfills</u> (publication 788) (https://www.epa.vic.gov.au/about-epa/publications/788-3).

Where a Type 3 cap is proposed, evidence supporting that this type of cap is appropriate (for example 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).

Calculating the operational component of landfill financial assurance

The operational component of landfill financial assurance funds the costs that may be incurred either by EPA in ensuring the safety of an operational landfill, or where an uninsured event exceeds the operator's capacity to pay for cleanup or rehabilitation before the landfill enters the post-closure phase.

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

The formula is based on the approved volume (in cubic metres) of filled cells that are not fully rehabilitated, plus the volume of approved cells (recorded in the current operating 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 formula for operational landfill financial assurance:

Operational financial assurance

cell volume (filled plus approved)

\$0.45/m³ x total

+ \$135,000

The formula uses estimated remediation costs for the following types of events at variably sized landfills. These events were selected as being representative of a wide variety of contingent events at landfills that could result in unexpected costs including:

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

This formula:

- assumes 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.
- is based on 2015 costs and will be indexed in subsequent years using the Consumer Price Index (CPI) adjustment calculation provided in <u>Appendix 1</u>.

Release of the operational component of financial assurance

In some circumstances, the operational component of financial assurance for a cell is no longer required:

- 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 sidewall. Final capping is demonstrated to meet the objectives of <u>Siting</u>,
 <u>design</u>, operation and rehabilitation of landfills</u> (publication 788)
 (https://www.epa.vic.gov.au/about-epa/publications/788-3) where phytocapping is used.
- Landfill gas and leachate management infrastructure and surface water management engineering controls are installed and operating.
- All licence conditions (and any relevant notice conditions) concerning leachate and gas management are being complied with for that cell.
- An environmental auditor has verified that the cell complies with all the above requirements, and their report is provided to EPA. Alternatively, written approval by EPA must be provided for cells that were fully capped before 2011.

Calculating the closure and aftercare components of landfill financial assurance

The calculation of the closure and aftercare components of landfill financial assurance is based on the costs associated with undertaking activities set out in:

- <u>Siting, design, operation and rehabilitation of landfills</u> (publication 788) (https://www.epa.vic.gov.au/about-epa/publications/788-3)
- <u>Closed landfill guidelines</u> (publication 1490) (https://www.epa.vic.gov.au/about-epa/publications/1490-1)
- Landfill licensing (publication 1323) (https://www.epa.vic.gov.au/about-epa/publications/1323-3).

Table 2 lists the minimum activities that the closure component of financial assurance should be calculated on.

Table 2: Landfill closure activities

Closure activities

Capping 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).

See more on the calculation of capping costs below.

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.

Closure activities

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.

Calculation of capping costs

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 will be as follows:

- If the licence specified a capping standard at the date of cell completion, this standard would apply. Otherwise, the standard at the time of closure applies.
- For closures after 2001, the standard at the time is a cap design compliance with <u>Siting</u>, <u>design</u>, <u>operation and rehabilitation of landfills</u> (publication 788) (https://www.epa.vic.gov.au/about-epa/publications/788-3). Currently, a cap design prepared in accordance with <u>Landfill licensing</u> (publication 1323) (https://www.epa.vic.gov.au/about-epa/publications/1323-3)is the standard that applies.

Progressive release of closure financial assurance

Any landfill area that has been signed off by an environmental auditor as fully capped and rehabilitated (or approved in writing by EPA if fully capped prior to 2011), does not need to be included in the closure calculation. For the closure component to be released by EPA, an

¹The cost of a hydrogeological assessment is not required where all cells onsite are fully engineered to the standard set out in *Siting, design, operation and rehabilitation of landfills* (publication 788) (https://www.epa.vic.gov.au/about-epa/publications/788-3).

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 under *Landfill licensing* (publication 1323) (https://www.epa.vic.gov.au/about-epa/publications/1323-3).

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 with *Siting, design, operation and rehabilitation of landfills* (publication 788) (https://www.epa.vic.gov.au/about-epa/publications/788-3).

environmental auditor must verify that all rehabilitation activities are completed. Final capping includes proven phytocapping is used where relevant to the site.

Calculating aftercare financial assurance

Table 3 explains the principles for calculating the aftercare component of financial assurance.

Table 3: Principles for calculating aftercare financial assurance

	Principle
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 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.

Table 4 lists the minimum activities that the aftercare component of financial assurance should be calculated on.

Table 4: Landfill aftercare activities

Aftercare activities 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.

Progressive release of aftercare financial assurance

Progressive release of aftercare financial assurance involves a risk-based calculation that considers the remaining environmental risks at the site.

Table 5 sets out the criteria that must all be met before EPA may considerer progressively reducing the aftercare financial assurance.

Table 5: Criteria for reducing aftercare financial assurance

	Criteria
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 by EPA 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	The financial assurance in place has covered costs to date, and so the financial assurance for the remaining aftercare activities can be reduced.

The final release of financial assurance

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.

Read more about the review and release of financial assurance in *Financial assurance for permissions and contaminated land management* (publication 2002) (https://www.epa.vic.gov.au/about-epa/publications/2002).

Calculating financial assurance for reportable priority waste management

Financial assurance for reportable priority waste (RPW) management is calculated on the cost of disposing of the amount of RPW that is permitted to be stored on the site under an EPA development or operating licence. The financial assurance may be used for cleaning up or remediation where the duty holder fails to undertake their obligations.

Financial assurance for organic waste processing (composting) of RPW is addressed separately in this guide.

Reportable priority waste disposal costs

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



About disposal costs

- Unit disposal costs for specific waste types are provided in Tables 6-9. A default rate of \$1,000 per tonne applies for waste types not otherwise specified. For very high-risk waste types, a different disposal cost may be applied.
- The costs are quoted in 2015 and shall be indexed in subsequent years using the CPI adjustment formula provided in Appendix 1.
- Where the facility is licensed to store several different wastes, the unit disposal cost is based on the RPW with the highest disposal cost.
- To minimise the amount of financial assurance required, licence holders can apply to vary their licence to specify separate waste limits for high-cost and low-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.

Waste type (Schedule 5 of the Regulations)	Waste code	Unit disposal cost (2015 dollars)
Highly odorous organic chemicals (including mercaptans)	M260	\$20,000 per tonne
Solvents, oils and materials contaminated with PCB at a concentration of 50 mg per kg or greater	M100	\$10,000 per tonne
Solvents, oils and materials contaminated with PCB at a concentration greater than 2 mg per kg and up to 50 mg per kg	M120	\$5,000 per tonne
Mercury waste	D120	\$3,000 per tonne
Chlorinated or halogenated waste Isocyanate	G150 M220	\$2,000 per tonne
Cyanide waste	A100, A110, A130	\$1,500 per tonne
Pesticides	H100, H120, H110	\$1,500 per tonne

Table 6: Waste disposal costs for high-cost reportable priority waste

Table 7: Waste disposal costs for lower-cost reportable priority waste

Waste type (Schedule 5 of the Regulations)	Waste code	Unit disposal cost (2015 dollars)
Oils, hydrocarbons, emulsions Sludges and slurries Residues	J codes T130 H (hazardous) N210, N205, T330	\$500 per tonne
Industrial wash waters	L codes categorised as hazardous	\$250 per tonne
Putrescible/organic wastes	K codes categorised as hazardous	\$100 per tonne

Containers contaminated with reportable priority waste

For containers contaminated with RPW, the unit disposal costs in Table 8 apply. If the container storage limit in the licence is expressed in weight, the disposal cost relates to the weight of the containers as well as RPW residues.

If the site has customer storage agreements in place that require containers to be returned to their owners, EPA may consider a lower amount of financial assurance. These customer agreements must be specified in the licence.

Table 8: Waste disposal costs for containers

Waste type	Waste code	Unit disposal cost (2015 dollars)
Rigid steel or plastic containers with an original volume less than 200 L contaminated with RPW	N100	\$20 each or \$2/kg
Rigid steel or plastic containers with an original volume equal to or greater than 200 L contaminated with RPW	N105	\$50 each or \$1/kg

Contaminated soil

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 9. For very large quantities, a lower rate may apply. A separate storage limit for Category A, B, C, D soil and soil containing asbestos only must be specified in the licence.

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

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

Read more about the classification of waste soil on EPA's website <u>epa.vic.gov.au</u>

Classification of priority waste that is soil (Schedule 6 of the Regulation)	Waste code (Schedule 5 of Regulations)	Treatment/disposal cost (2015 dollars)
Category A	N120	\$850 per tonne
Category B		\$450 per tonne
Category C		\$180 per tonne
Category D		\$180 per tonne
Soil containing asbestos only		\$200 per tonne

Table 9: Treatment/disposal costs for priority waste that is soil

Organic waste processing of reportable priority waste

Calculation of financial assurance for organic waste processing (composting) of RPW or RPWcontaminated wastes is based on the cost of offsite disposal.

Two components are potentially relevant to the calculation of financial assurance for RPW organic waste processors are the storage and mixing of reportable priority waste.

Reportable priority waste storage

For premises where an RPW storage limit is specified in the licence. This component of financial assurance is calculated in the same manner as for RPW management – see <u>formula for RPW disposal</u>.

Reportable priority waste mixing

For premises where there is an area or pit for mixing RPW with other materials. The PIW mixing component applies 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).

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

Calculating financial assurance for waste and resource recovery facilities

Financial assurance may be required for medium and large waste and resource recovery facilities (WRRFs). The scale of the waste activity and the type of waste handled at a facility determines the activity type and type of permission required.

Table 10 sets out the threshold values for these activity types as prescribed in Schedule 1 of the Regulations.

Table 10: Prescribed permission activities for waste resource recovery that may require financial assurance

Activity type (Schedule 1 of the Regulations)	Description of prescribed permission activity	Prescribed permission type
A13a Waste and resource recovery -large	4,000 tonnes or more combustible , recyclable waste received in one month or, 10,000m ³ of waste stored on the premises at any time	Development licence, operating licence
A13b Waste and resource recovery -medium	 4,000 tonnes or more of waste <i>excluding</i> combustible, recyclable waste received in one month or, 10,000m³ of waste stored on the premises at any time. Less than 4,000 tonnes of waste (<i>including</i> specified combustible, recyclable waste) received in any month and, between 5,000 m³ and 10,000 m³ of waste stored on the premises at any time. 	Development licence, permit

Calculation method

If EPA determines that financial assurance is required for a WRRF, the method to calculate the amount of financial assurance is based on the cost of disposing of waste to landfill. This method factors in the scale of the waste activity and the type of waste handled at a facility and is representative of the various cleanup scenarios that may arise at a WRRF.

Assumptions for calculating financial assurance for WRRFs

- Gate fees for landfills are set at \$200.00 per tonne of waste, regardless of the location of the waste resource recovery facility (metro or regional).
- If the maximum amount of waste permitted to be stored at the site is specified in volume in the permission, EPA will apply a default density conversion factor of 186 kg/m³ to convert the maximum storage volume of waste into weight unless the permission conditions narrowly restrict the types of waste that can be accepted.

• Comingled waste consisting of combustible and non-combustible waste will be treated as combustible for the purposes of calculating the financial assurance.

The formula for financial assurance for WRRF sites that store *non-combustible*, recyclable, waste material:

- Financial assurance per tonne of recyclable waste
- Gate fees of the landfill per tonne
- Transport cost per

tonne

administration charges

EPA

where:

Gate fees of the landfill = \$200.00 per tonne

Transportation costs = \$15.00 per tonne

EPA administration charges calculated based on the following assumptions:

- the salary for a project manager for the number of months it would take to remove the waste stored at the facility, according to the permission conditions
- the monthly project manager salary of \$9,113
- the amount of waste that can be removed in one month is 4,000 tonnes.

The formula for financial assurance for WRRF sites that store *combustible*, recyclable, waste material.

Financial assurance per tonne of recyclable waste

- Gate fees of the landfill per tonne
 - Transport cost per tonne
- ort EP
 - EPA administration

charges

X 1.5

where:

Gate fees of the landfill = \$200.00 per tonne

Transportation costs = \$15.00 per tonne

EPA administration charges are calculated based on the following assumptions:

- the salary for a project manager for the number of months it would take to remove the waste stored at the facility, according to the permission conditions
- the monthly project manager salary of \$9,113
- the amount of waste that can be removed in one month is 4,000 tonnes.

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North Metro	North West	
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Appendix 1: Calculating a Consumer Price Index adjustment for financial assurance – reportable priority waste management

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).

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

where:

 ${\bf N}$ 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