

# Waste Mass Balance Guideline

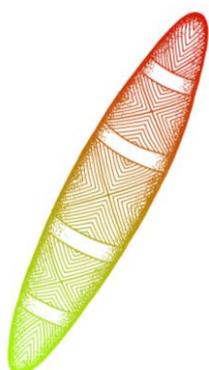
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### 1. Purpose of this guideline

Under the Environment Protection Act 2017 (the Act) and the Environment Protection Regulations 2021 (the Regulations), a waste levy is payable for all wastes received at permissioned landfills.

Permission holders or liable persons must submit quarterly levy statements to EPA, declaring the amount of waste received. These statements determine the amount payable for the waste levy.

From 1 July 2022, waste mass balance reporting is expected to be submitted as supporting information in waste levy statements. This will help verify that the appropriate waste levies are paid, only allowable rebates are claimed, and that each tonne of waste received at the permissioned premises and its fate is accounted for.

This guideline is intended to assist landfill permission holders/liable persons in preparing waste mass balance supporting information for quarterly waste levy statements.

For the purposes of this guideline:

- 'liable person' means a permission holder or person that should have held a permission for prescribed levy activities on premises subject to the waste levy
- 'permission holder' is a person who holds an EPA permission to carry out a waste levy activity on premises subject to the waste levy
- 'waste levy activity' refers to a prescribed levy activity, as identified in Regulations Part 3.6 Regulation 44
- 'allowable rebate' refers to a prescribed allowable rebate as identified in Regulation 46. This includes cover material rebate and rebate for resource recovery.

The waste mass balance report template provides a standardised method for recording all relevant waste flows. It is structured to record all incoming waste received by the permission holder, temporarily stored waste, waste used within the permissioned landfill for operational purposes, waste disposal and any waste removed from the permissioned landfill for resource recovery.

EPA publication 332.8 *Calculating waste levy and allowable rebate claim* provides guidance on preparing quarterly waste levy statement submission to assist permission holders/liable persons to comply with their levy obligation.

#### 1.1. Legal Status

This guideline contains information related to tracking waste at a permissioned landfill premises to assist preparation of waste mass balance supporting information for quarterly waste levy statements.

The guideline itself is advisory only and is not the source of any legal requirements. It provides a summary of the legal requirements outlined in the Act and the Regulations.

#### 1.2. Thank you

This guideline was developed in consultation with industry. EPA would like to thank those that made submissions or provided input to the early drafts. In particular EPA would like to thank the Australian Landfill Owners Association, Hanson Landfill Services Pty Ltd, Suez Recycling

and Recovery Pty Ltd, Barro Group Pty Ltd, Surf Coast Shire Council and the participants of the webinar held on 22 September 2021.

## 2. Waste Mass Balance Process

This section outlines the key issues and requirements in waste mass balance reporting.

Waste mass balance is the process of reconciling the tonnes of all types of waste that are received at a permitted landfill with their fates. Figure 1 provides a summary of the waste flow calculations used in preparing summary information for waste levy statements.

### Waste Flow Diagram

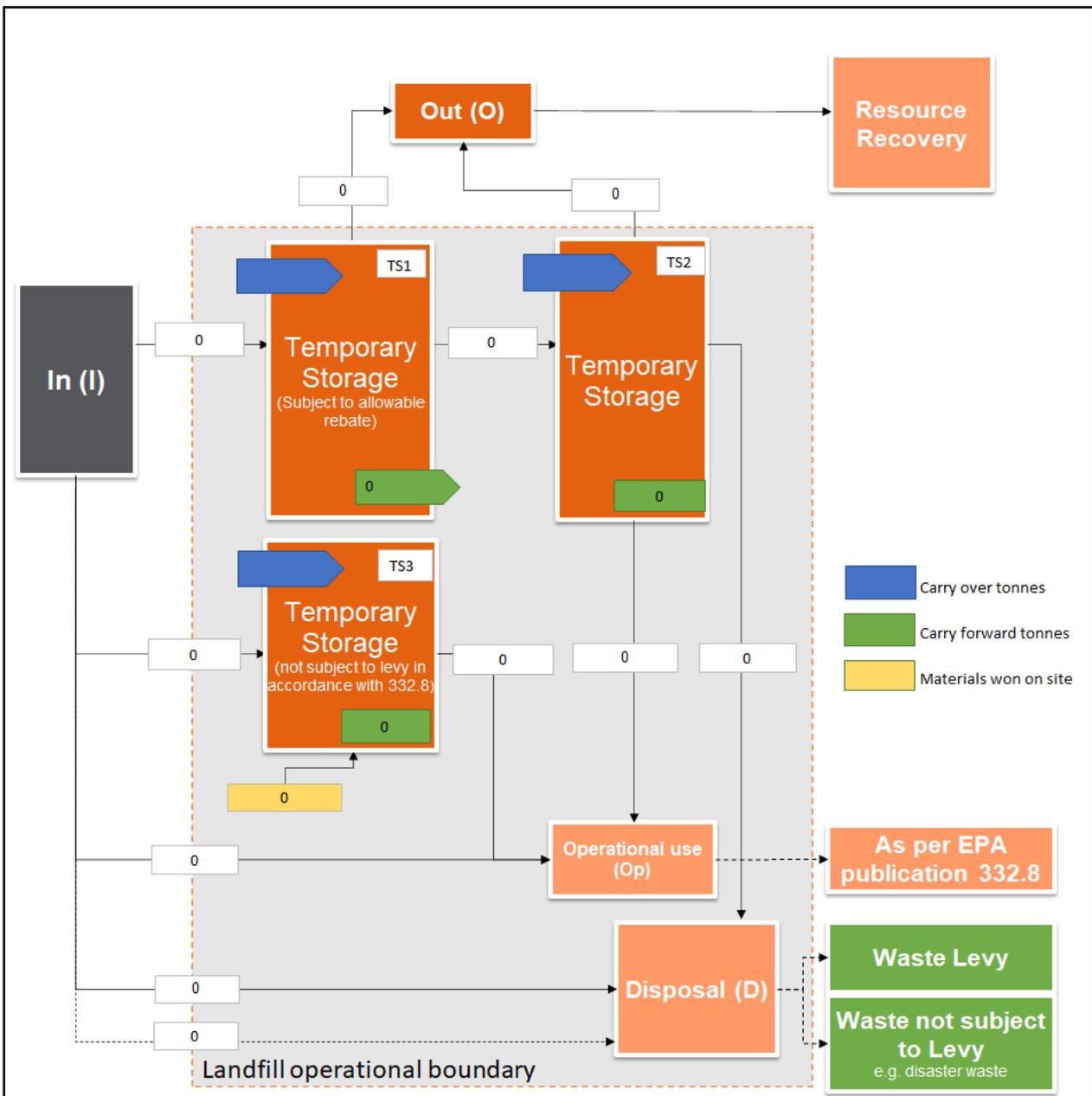


Figure 1 Waste flow diagram for mass balance calculations

The waste mass balance report allows the recording of information on incoming municipal waste, industrial waste, Category B waste, Category C waste, Category D waste, soils containing asbestos, packaged asbestos, fill material and other (for example, waste material for construction) received at the permissioned landfill, how it is managed onsite (including temporary storage) and the fate of the waste.

### 2.1. Recording waste flows

Waste flows are recorded for all wastes received at a permissioned landfill including:

- Landfilled wastes
- Waste that leaves a permissioned landfill for resource recovery
- Temporarily stored waste (pending resource recovery, use in operational activities or disposal)
- Waste used for other onsite purposes including cell construction, capping and construction of roads.

Figure 1 provides a summary representation of the key data points requiring collection and the waste flows that are recorded comprising:

- In (I) – all waste entering the permissioned landfill
- Out (O) – waste leaving the permissioned landfill for resource recovery
- Operational use (Op) – waste intended for an approved operational use onsite
- Disposal (D) – waste intended for disposal
- Temporary stored (TS1) – waste where levy has been paid and is temporarily stored onsite, subject to allowable rebate for resource recovery in this period or carried over from the previous quarter when held for less than 3 months
- Temporary stored (TS2) – waste where levy has been paid and temporarily stored onsite. This may be suitable for resource recovery, operational use (daily cover or haul road construction for levy paid waste) or disposal
- Temporary stored (TS3) – waste temporarily stored where levy has not been paid subject to operational use in accordance with Section 5 of EPA Publication 332.8.

Within a quarterly reporting period there are three clearly defined flows:

- waste coming into the permissioned landfill for disposal and subject to the levy
- waste coming into the permissioned landfill being segregated and then leaving the premises for resource recovery
- waste coming into the permissioned landfill for operational use.

When waste has been 'won onsite' it is generated within the permissioned landfill. It has not entered the landfill (for example, via the weighbridge), and should be declared as temporary storage (TS3). See sections 2 and 4 for further detail.

### 2.2. Temporary Storage

The temporary storage of wastes may be:

- segregated materials destined for resource recovery
- incoming waste for onsite operational use (for example, daily cover, road base or engineering)
- material 'won onsite' within the permissioned landfill for onsite operational use.

Bulking and management of waste can be observed in the mass balance calculations as the difference between incoming wastes and those with a recorded fate.

Temporary storage can span more than one quarterly reporting period. This is tracked via three categories in the 'Waste Fate' column to avoid future recording and reporting errors.

Temporary storage categories used are:

- Temporary Storage TS1 (resource recovery and levy paid daily cover or haul road construction)
- Temporary Storage TS2 (carry over for resource recovery and levy paid daily cover or haul road construction)
- Temporary Storage TS3 (waste where levy has not been paid subject to operational use in accordance with Section 5 of EPA Publication 332.8)

There are several operational uses for which waste may be used. Depending on where the waste is generated, where it is used and for what purpose, the waste levy might not be applied (see EPA Publication 332.8).

The mass balance report template uses colour formatting to indicate when an operational use might be suitable for allowable rebate. The waste may be used for the following operational activities if suitable as per approved design of the respective operational activity:

- Construction
- Final Capping<sup>1</sup>
- Cover material
- Internal haul roads.

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<sup>1</sup> Waste used for intermediate capping may be recorded under final capping.

### 3. Waste and Material Types

The Regulations provide detail on how the duties in the Act are to be met by permission holders.

There are three different waste types defined in the Act as summarised below:

- Municipal waste - waste arising from municipal or residential activities, and includes waste collected by, or on behalf, of a council, but does not include industrial waste<sup>2</sup>.
- Industrial waste - waste arising from commercial, industrial, or trade activities or from laboratories; or that has been prescribed as industrial waste.
- Priority waste - any waste, including municipal waste and industrial waste, that is prescribed to be priority waste for the purposes of:
  - eliminating or reducing risks of harm to human health or the environment posed by the waste
  - ensuring the waste is managed in accordance with Part 6.5 of the Act (which sets out duties and controls relating to priority waste)
  - facilitating waste reduction, resource recovery and resource efficiency.

Reportable priority waste is a subset of priority waste that carries the highest levels of controls as it poses the greatest level of risk to human health and the environment.

#### 3.1. Waste categories

Under the Act and Regulations, waste received at a permissioned landfill subject to the waste levy needs to be classified to determine its waste categorisation for waste levy calculation and how it will be managed. The categories are set out in Regulation 48 and shown in Table 1.

These categories are included in the incoming waste categories to allow for their separate allocation in the waste mass balance calculations.

#### 3.2. Temporary stored waste

Temporary storage of waste is reported as part of the waste mass balance. The provision of details on how temporarily stored waste is managed is critical to enable the accurate calculation of waste levy liabilities and allowable rebates for resource recovery. How the temporary storage of waste is managed will influence a liable person's reporting requirements in relation to that waste. Section 2.2 provides the key assumptions relevant to temporary

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<sup>2</sup> For clarity, the municipal waste (MSW) waste levy rate can be applied to residual waste from a Materials Recycling Facility (MRF) or Transfer Station (TS) if it originated from a municipal source (for example, municipal kerbside collections). Adequate documentation will need to be obtained and retained by the liable person from the operator of these facilities to demonstrate the origin of the residual waste. See EPA Publication 332.8 for further details.

storage of waste and section 4.4 describes how these are recorded in the waste mass balance template.

*Table 1 Summary of the landfill waste categories*

Waste type	Waste categories for landfills
Municipal	Municipal waste sources
Industrial	Waste from construction and demolition (C&D) and commercial and industrial (C&I) sources.
Fill material	Fill material
Priority	Industrial waste sources (other than fill material)
	Municipal waste sources
	Category B waste*
	Category C waste*
	Category D waste*
	Soil containing asbestos only*
	Packaged waste asbestos*

\* Reportable Priority Wastes

### 3.3. Outgoing waste types

Under Section 147 (b) of the Act permission holders can submit any prescribed allowable rebate claim for waste recovered from the permissioned landfill for the purposes of resource recovery. Examples of resource recovery waste material types are provided in Table 2 and can apply to both Municipal Waste and Industrial Waste.

#### **Allowable rebate**

To claim an allowable rebate on the waste levy, the Act and Regulations require the provision of the information set out in Regulation 49 to demonstrate that waste has been sent for resource recovery.

An allowable rebate may be claimed for recovery of municipal, industrial and reportable priority waste, excluding wastes that are soil (No rebate is available for priority waste that is soil under Regulation 46 (2)(a)).

Further guidance on eligibility and how to claim the levy rebate is provided in EPA publication 332.8 *Calculating waste levy and allowable rebate claim*.

*Table 2 Resource recovery waste material types.*

### Resource recovery waste material type

Concrete

Metal

Timber/green waste

Plastic

Cardboard/paper

Fill Material

Other (e.g. goods sold in an onsite shop)

## 4. Completion of mass balance report template

The waste mass balance report template has been developed to enable all landfill permission holders to report the total mass of waste received at permissioned landfill sites, how much is disposed of at the permissioned landfill, and how much is sent for resource recovery or used onsite for operational activities.

### 4.1. Waste received at the landfill

All incoming waste received at the permissioned landfill premises during the previous quarter is reported against the following:

- waste category. The option of 'Other' is also provided if the landfill is tracking other incoming materials
- how the mass of each waste category has been determined
- the total mass (in tonnes) for each waste category received
- the waste fate if not sent for disposal – either onsite use, recovered resource

A summary of the data options by column in the waste mass balance template for incoming waste received at the permissioned landfill is provided in Figure 2.

Waste Category	Mass Determination	Mass (tonnes)	Levy applied this quarter	Waste Fate
Packaged Waste Asbestos	Onsite weight		MSW	Disposal
Industrial Waste	Offsite weight		IND	Operational use
Municipal Waste	Conversion factor		PW B	Recovered resource
Fill Material			PW C	Temporary Storage (resource recovery)
Priority Waste - Cat B			PW D	Temporary Storage (operational use)
Priority Waste - Cat C			Soils Containing Asbestos	
Priority Waste - Cat D			Packaged Waste Asbestos	
Soil Containing Asbestos			Not levied	
Other			Allowable rebate claim	

Figure 2 Summary of data required for waste in flow (extract from mass balance template)

#### 4.2. Waste transported from the landfill for resource recovery

Waste segregated and transported from the permissioned landfill during the previous quarter is reported against the following:

- waste category<sup>3</sup>
- material type based on the segregation of waste suitable for resource recovery
- further information (for example, did the recovered waste meet a standard or approval)
- destination of where recovered waste is being transferred to, either intrastate, interstate or overseas
- how the mass of each waste category has been determined
- the total mass (in tonnes) of each waste material type transported from the permissioned landfill for resource recovery.

A summary of the data options by column in the mass balance template for waste transported from the landfill for resource recovery is provided in Figure 3.

Waste Category	Mass Determination	Mass (tonnes)	Waste Fate	Waste Material Type	Further Information (Waste-out)	Destination (Waste-out)
Packaged Waste Asbestos	Onsite weight		Disposal	Concrete		SA
Industrial Waste	Offsite weight		Operational use	Metal		VIC
Municipal Waste	Conversion factor		Recovered resource	Timber/green waste		NSW
Fill material			Temporary Storage (resource recovery)	Plastic		QLD
Priority Waste - Cat B			Temporary Storage (operational use)	Cardboard/paper		WA
Priority Waste - Cat C				Clean fill		NT
Priority Waste - Cat D				Other		TAS
Soil Containing Asbestos						ACT
Other						International

Figure 3 Summary of data options for waste out flow (extract from mass balance template)

<sup>3</sup> Not all waste categories are eligible for resource recovery. This should primarily be assigned to either municipal waste, industrial waste or priority waste.

### 4.3. Waste used for operational purposes

Waste used within the permissioned landfill for operational purpose(s) during the previous quarter is reported against the following:

- waste category
- the type of operational use for which the eligible waste was used
- operational activity for the waste, including use if the waste has not been subject to levy (in accordance with the requirements of EPA Publication 332.8)
- description of the onsite operational use of the waste
- how the mass of each waste category has been determined
- total mass (in tonnes) of each waste category used at the permissioned landfill

A summary of the data options by column in the waste mass balance template for waste used for operational use is provided in Figure 4.

Waste Category	Mass Determination	Mass (tonnes)	Waste Fate	Operational use type	Activity description (as specified in EPA 332.8)	Description of operational use or planned use for levied wastes
Packaged Waste Asbestos	Onsite weight		Disposal	Construction	Haul Road Management Plan has been certified	
Industrial Waste	Offsite weight		Operational use	Final Capping	Cover material is sourced from excavations within	
Municipal Waste	Conversion factor		Recovered resource	Cover material		
Fill Material			Temporary Storage (resource recovery)	Internal haul roads		
Priority Waste - Cat B			Temporary Storage (operational use)	Landfill		
Priority Waste - Cat C						
Priority Waste - Cat D						
Soil Containing Asbestos						
Other						

Figure 4 Summary of data options for wastes used for onsite purposes flow (extract from mass balance template)

### 4.4. Temporary Storage

The total mass of waste temporarily stored for resource recovery, operational purposes or disposal should be recorded in one of the two ways described below:

- **Waste entering the permissioned landfill** and designated as temporary storage (either for future recovery, onsite purposes or disposal) should be defined as a 'Waste in' with a waste fate of either
  - 'temporary storage (resource recovery and levy paid operational activities such as daily cover or haul road construction without a certified Haul Road Management Plan (HRMP))', or
  - 'temporary storage (operational use)'.

A levy rate should be applied to all incoming waste in the 'Levy applied this quarter' column. If waste is received for daily cover or haul road construction (without a certified HRMP) and levy is paid, such waste must be declared either in TS1 or TS2 of Figure 1.

- **Material 'won onsite'** has not entered permissioned landfill. It can be declared as a 'temporary storage' flow with a Waste Fate of 'temporary storage' as an input to TS3 of Figure 1. As the waste levy does not apply to material 'won on site' EPA does not expect that this material is passed through the weighbridge. It should be included in the waste

mass balance report and a reasonable estimate made of the amount. The weight may be calculated using the volume of the truck and density of material provided in Table 3.

All temporarily stored waste that has either entered the permissioned landfill or been declared during the reporting period is reconciled against all recorded fates.

The balance of temporarily stored waste is calculated and reported at the top of the waste mass balance template (in the header section of the sheet) and can be used to carry over into the next reporting period.

In the event of an allowable rebate claim, the landfill permission holder will need to demonstrate that this waste has been levied and transitioned into and out of the permissioned landfill within a three month period.

### 4.5. Waste Mass balance

The waste mass balance template can be reconciled to demonstrate that all incoming waste and any onsite won material equal all the declared fates of waste. The equation used is as follows:

[Incoming (I) + Temporary Storage (TS1 – carried over from last period) + Temporary Storage (TS2 – carried over from last period) + Temporary Storage (TS3 – carried over from last period)]

IS EQUAL TO

[Disposed (D) + Operational use (Op) + Recovered Resource (O) + Temporary Storage (TS1 - balance) + Temporary Storage (TS2 balance) + Temporary Storage (TS3 – balance)]

## 5. Measurement of waste

All landfill permission holders must use weighbridges to weigh the waste entering a permissioned landfill. Further details are provided under section 8.0 of the EPA Publication 332.8 *Calculating waste levy and allowable rebate*.

### 5.1. Conversion factors for Stockpiles

The conversion factors provided in Table 3 can be used to estimate the weight of temporary stored waste (from m<sup>3</sup> to tonnes) where necessary.

Table 3<sup>4</sup>: Conversion factors for commonly stockpiled waste or materials

Material Type	Tonnes/m <sup>3</sup>
Compacted asphalt	2.4
Bricks	1.2
Masonry	1.0
Concrete	1.5
Insulation	0.75
Plasterboard	0.22
Soil	1.8
Fill Material	1.33 <sup>5</sup>
Sand/recycled sand	1.7
Quarried materials (e.g. boulders, cobbles, gravels)	1.4
PM1/PM2 recycled roadbase	1.85
10 mm aggregate	1.3
20 mm aggregate	1.2
Green waste - garden organics	0.2
Green waste – contacted	0.26
Green waste – uncompacted/loose	0.15

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<sup>4</sup> Table 2 reference: South Australia Environment Protection Authority, Waste reporting, record keeping and measurement standard, 2021 except for fill material.

<sup>5</sup> As per fill material density provided in Publication 332.8

### 5.2. Stocktake requirements

Landfill permission holders may choose to complete regular stock-taking of temporarily stored waste as part of their permission conditions. The waste mass balance template could assist with this process but is not proposed as a replacement for any existing stocktake requirements.

## 6. Submission of completed template

Submission of the waste mass balance report as a supporting document with your waste levy statement is expected from 1 July 2022, commencing with the first quarterly statement due in 2022-23.

If you need a copy of the waste mass balance report template or have questions about completing it, please contact the Waste Levy Team on 1300 372 842 or [waste.levy@epa.vic.gov.au](mailto:waste.levy@epa.vic.gov.au)