

# Nursery waste self-assessment survey form

## Introduction

To develop an effective waste minimisation program and reduce waste costs it is necessary to collect the relevant information on the type and quantity of waste being generated, why the waste is generated and how that waste is disposed. A self-assessment survey is a quick method of collecting this information and the associated costs of waste management and disposal. The information recorded can be used to

1. Calculate the true cost of waste management and disposal to the business.
2. Identify practices or processes that generate large quantities of waste which may benefit from the introduction of waste minimisation techniques.
3. Determine what waste may be recycled, reused, or redirected to reduce costs or generate an income.
4. Help negotiate waste collection contracts with a waste collection service.

Follow the instruction and answer the question for each section below to collect the information required for a waste assessment. After completing self-assessment survey form, highlight what waste materials are generated the most and identify what disposal or recycling services are available for that waste material in your areas. Use the 'recycling near you' website (<http://recyclingnearyou.com.au/>) to find local council waste information and recycling programs. Contact a waste disposal company to discuss what recycling or diversion options are available in your area, and do an internet search for local recycling services. The Planet Ark 'Business recycling website' (<http://businessrecycling.com.au/>) also has a recycling service search function by location which is a good place to start. For smaller quantities of recyclable materials contact local environmental and community groups regarding what recycling programs they support, some of these groups collect recyclable materials to generate funds for charity.

## Units of measure:

The convention for measuring waste in the waste industry is by weight e.g. kilograms or tonnes, but waste can be estimated as a volume e.g. litres (L), square metres (m<sup>2</sup> or sqm), or cubic metres (m<sup>3</sup>). It will help to have an understanding of both the volume and weight of waste materials needing disposal when discussing options with waste disposal or recycling companies. Estimate waste as a weight if possible or use a standard volume measure when estimating waste for easier conversion to a weight. Refer to the conversion table for approximate volume to weight conversion factors.

Industrial bins come in sizes from 1m<sup>3</sup> to 20m<sup>3</sup>, but some other common bin sizes include -

1. Large wheelie bin = 240L,
2. Small wheelie bin = 120L,
3. Standard wheelbarrow = 100L,
4. 44 gallon drum = approximately 200 litres.

It is also important to identify the frequency of waste generation, e.g. X kg per week or month, this means that X kg is generated every week or month of the year. A longer period, e.g. 3 or 6 months, means that the volume of waste estimated will accumulate over this period and will need to be disposed of at the end of the stated period. This allows the bin collection frequency of each waste type to be determined. A change in bin collection frequency will highlight a change in waste generation. Specific practices or processes that generate large volumes of waste in a short period e.g. a large accumulation of packaging due to a product delivery, should be recorded as a specific occurrence to be investigated.

Date of assessment: \_\_\_\_\_ Conducted by: \_\_\_\_\_

### General waste information:

This information will provide a quick reference for your waste management costs and contract details. It can be used as a guide when developing a waste management plan or when reviewing waste management practices in the future. A 'No' answer to any of the questions indicate a potential opportunity to reduce waste generation and disposal costs.

	Collection frequency	Billing frequency
What companies do you currently use for -		
General waste collection?		
Recyclable material collection?		
Other waste removal?		
Is waste collection based on weight or volume?	Weight	Volume
Has an audit been conducted onsite previously?	Yes	No
Have the employees been trained in waste reduction procedures?	Yes	No
Have waste minimisation strategies been implemented?	Yes	No

### Waste management costs

The cost of waste management is more than just the cost of a waste collection service, it includes staff labour and equipment maintenance costs used for onsite waste management. These costs can change with changes to input resources or production processes and should be monitored regularly. Also include any fees or transportation costs incurred from separate disposal at council landfill site.

How much does 'general waste collection' cost per year?	\$
How much does 'recycling services' cost per year? (if not included above)	\$
How much does other waste disposal cost per year? (e.g. council dump fees)	\$
What are the transport costs associated with other waste disposal?	\$
Are there any equipment costs for onsite waste collection (e.g. forklift/tractor fuel)	\$
How many staff hours are used for onsite waste management?	Hours

### Waste bin information:

The quantity of waste can be estimated from the number and size of bins used, how full the bins are at collection and the collection frequency. Record the details for each bin type and follow the example below to calculate waste volume per year. Use the conversion factor table on page 6 to convert waste volumes to weight. Using bin information is only a simple estimation of waste and will not accurately capture each waste type generated. Use the 'Waste recording sheet' on page 4 to record individual waste type quantities.

#### Waste calculation example:

A nursery has 3, 3m<sup>3</sup> greenwaste bins that are approximately 75% full at collection. They are collected every 2 weeks. What is the total greenwaste collected per year?

$$3 \text{ greenwaste bins} \times 3 \text{ m}^3 \times 0.75 \text{ (75\% full)} = 6.75 \text{ m}^3 \text{ of greenwaste is generated every 2 weeks.}$$

$$6.75 \text{ m}^3 \times 2 = 13.5 \text{ m}^3 \text{ per month}$$

$$13.5 \text{ m}^3 \text{ per month} \times 12 = 162 \text{ m}^3 \text{ per year}$$

$$\text{From the conversion factor table, greenwaste (assuming light compaction)} = 200 \text{ kg/m}^3$$

$$162 \text{ m}^3 \text{ per year} \times 200 \text{ kg/m}^3 = 32,400 \text{ kg per year} = 32.4 \text{ Tonnes of greenwaste per year.}$$

## How many waste bins do you use?

Bin type	Number of bins	Size (m <sup>3</sup> )	% full at empty	Collection period (Wk/Mth)	Volume per period	Volume per year	Tonnes per year
General waste - Industrial bins							
General waste - Domestic bins							
General recycling - Industrial bins							
General recycling - Domestic bins							
Cardboard & paper recycling							
Plastic pot recycling							
Soft plastic recycling							
Metal recycling							
Other recycling							
<b>Estimate of waste generated over a year from bin data =</b>							

## Waste recycling or diversion details:

This section highlights waste types that have the potential to be recycled or diverted for alternative use either onsite or to another industry. Answering 'No' to any question indicates a potential opportunity to reduce disposal costs by diverting waste materials from the general waste stream. What waste materials can be diverted for recycling or reuse will depend on the recycling services available in your location.

<i>Do you separate and recycle all recyclable material?</i>	Yes	No
<i>Which waste items do you currently separate and recycle?</i>		
Cardboard	Yes	No
Paper	Yes	No
Plastic growing containers	Yes	No
Soft plastics	Yes	No
Other plastics	Yes	No
Glass	Yes	No
Greenhouse cladding	Yes	No
Metals	Yes	No
Other:	Yes	No
Do you currently wash and reuse growing containers and trays?	Yes	No
<i>Is green waste and other organic waste separated from general waste?</i>	Yes	No
<i>Is green waste and other organic waste sent to a composting facility?</i>	Yes	No

## Waste recording sheet:

(Copy this sheet and complete a separate sheet for each area or department if required)

Business area (e.g. dispatch, production, workshop, etc.)

Number of waste collection points in the area?

Staff comments e.g. problem items, time taken, alternative processes.

Record how much of the following waste types are generated per month or per year

Type of waste	How much (m <sup>3</sup> or Kg)	How often (per month or year)	Quantity per year
Green waste			
Depleted or contaminated growing media			
Chemicals – (liquid or granular)			
Fertiliser – (liquid or granular)			
Plastic plant containers – (pots, tubes & trays)			
Plastics packaging & wrap			
Plastic storage drums			
Paper & cardboard packaging (production)			
Paper – (Office)			
E-waste - (printers, computers, controllers, etc.)			
Glass – (general use e.g. window panes)			
Greenhouse covering material – (cladding, films, netting)			
Weed matting and builders plastic			
Irrigation pipe – poly/plastic			
Irrigation pipe – galvanised			
Irrigation fittings (solenoids, valves, etc.)			
Structure material – (Metal & wire support frames etc.)			
Steel			
Aluminium			
Pallets - Wooden			
Pallets - Plastic			
Timber			
Faulty equipment – Mechanical e.g. packing or grading machines			
Batteries – (car, truck or general standard)			
Sediment traps sludge			
Depleted filtration material			
Oils – (mechanical and other lubricants)			
Rubber items – (truck or trolley tyres or bumper strips)			
Other waste not identified above:-			

Once the information has been collected you can use the 'waste management cost estimate worksheet' or the 'waste management cost estimate calculator' to work out bin costs, waste quantities and the total waste management and disposal costs for your business. The 'waste management cost estimate calculator' can also be used to compare changes in waste management costs and provide a basic cost benefit analysis for implementing any alternative waste management program.

Calculate yearly quantities for all waste types to identify what waste types to focus on for alternative disposal. If you generate a large quantity of one waste type over a year, contact a recycling services in your area and discuss recycling options. Separating recyclable materials from general waste will reduce general waste volumes. Depending on the storage capabilities, recycling may only need to be collected once every 3 to 6 months reducing both general waste and recycling collection costs.

Alternatively there may be another business, environmental or community group in your area that will collect certain waste items for recycling or reuse. For example, some materials recovery facilities have partnered with work programs or community groups to offer a recycling program that generates funds to support charity organisations. Contact your local council or charity group to find what options there could be for you.

## Waste conversion factors: Volume to Weight

These conversion factors have been collated from various sources for the purpose of converting gross volumes to gross weights. Conversion values will vary depending on the level of compaction and moisture content. Light compaction refers to slight physical force applied by humans and compacted refers to mechanical compaction by a hydraulic ram or baling machine. To obtain a more accurate waste conversion, the material should be sorted and weighed separately.

Type of waste	Kg/m <sup>3</sup>		
	Uncompacted	Light compaction	Compacted
General waste – mixed garbage	150	270	400
General recycling	13	23	
Green waste soft – general (foliage, seedlings)	91	200	445
Green waste hard - woody cuttings (trees & shrubs)	150	450	900
Growing media – Old/Rejected (double weight if wet)	50	200	400
Compost – mixed wet	237	474	949
Plastic - plant pots & trays		72	139
Plastic - other storage containers	10	72	139
Plastic - soft (plastic wraps & packaging)	39	78	156
Plastic - polystyrene	14	21	28
Plastics – Builders & weed mat (~ 114g/m <sup>2</sup> )	70	170	348
Cardboard & paper - packaging	100	130	296
Paper only – Office	76	150	237
Combined production and office card & paper	100	133	600
Glass – containers	250	347	411
Glass – sheets or panes	411	411	411
Greenhouse films –(0.2kg/m <sup>2</sup> – 0.5kg/m <sup>2</sup> )	43	320	910
Greenhouse cladding (polycarbonate)			1190
Shade cloth – (50% shade; 0.12kg/m <sup>2</sup> )	21	160	455
Sediment traps sludge (wet)	720	949	1186
Depleted filtration material (material dependent)	560	720	1000
Gravel - growing bed	1500	1800	2000
Irrigation pipe and irrigation fittings	80	120	
Metal		140	
Aluminium	139	140	154
E-waste – general office & production	105	113	120
Rubber – loose & bumper strips	140	200	400
Pallets – wooden (~20 kg each)	156	156	156
Wood/Timber – soft	150	200	300
Wood/Timber - hard	900	1000	1100
		Other units	
	Light-duty	Med-duty	Heavy-duty
Plastic – 25L drums (~ weight of 1 drum empty)		1kg	1.6kg
Batteries – commercial (size dependent)	~ 5kg	Car 12.5kg (75/m <sup>3</sup> )	Truck 18kg (55/m <sup>3</sup> )
Tyres – Car; Light Truck/forklift; Heavy Truck	9 kg	14 kg	45 kg
Faulty equipment – (whitegoods average)		~ 68kg/	
Oils – (mechanical and other lubricants)	0.8 kg/L	0.9 kg/L	0.96 kg/L
Chemicals – (liquid or granular average)		0.9 kg/L	
Fertiliser – (liquid or granular average)	0.98 kg/L	1.1 kg/L	1.3kg/L (wet)