Draft Approved Methods for Recycling Facilities

Consultation workshop

Outline

- Who is affected?
- What do they have to report?
- How will this affect facilities?
- Principles for approved methods
- Draft methods
  - Estimating amount received & leaving
  - Estimating stockpiles
  - Estimating bulk densities
  - Estimating source of waste
- Alternative methods
- Feedback sought

Who is affected?

Liable persons that are the occupier of premises, whether or not the person holds a licence in respect of the premises —

a) if reportable waste is treated, processed or sorted at the premises for the purposes of reprocessing, recycling or energy recovery; and

b) if, as a result of that treatment, processing or sorting, at least 1 000 tonnes of reprocessed, recycled or recovered material is produced in a financial year at the premises that —

   I. needs no further processing and is ready for use as a production input or a final product; or

   II. is to be exported from the State

That is – Recyclers producing more 1,000 tpa of "product".

What do “liable” recyclers have to report?

- Amount of waste received (tonnes per annum)
- Amount of material processed (tonnes per annum)
- Amount of material stored in stockpiles at the end of financial year (tonnes)
- Amount of residual waste or processing losses (tonnes per annum)
- Destination / fate of material received (recycling, stockpiled, waste-to-energy or disposal to landfill)
- Destination / fate of processed material (process/sold locally, exported interstate, exported overseas)
- Material category of waste received
- Source waste stream of waste received (MSW, C&I or C&D)
- Geographic source of material received (Perth metropolitan region, Peel region or other regions)

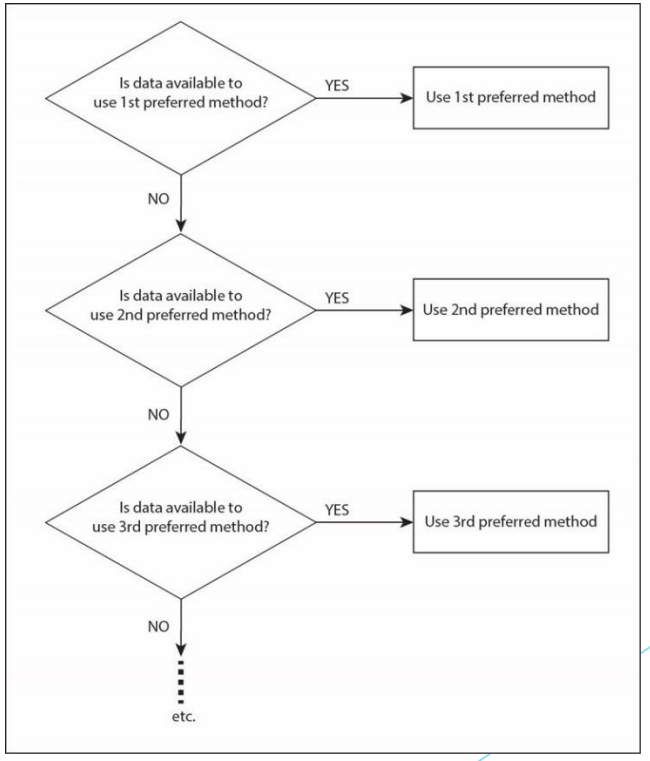
How does this affect facilities?

- Liable entities will be required to inform DWER of their liability
- Need to record data necessary to report at the end of each financial year
- Need to keep records
- Need to compile data in CEO-approved reporting format
- Need to submit annual data report by 1 October each year

Principles of approved methods

- Clear identification of the point at which the data is collected (for example, at point of collection, point of disposal, on entry to the facility or on exiting the facility)
- Consistent (the same methodology should be used to collect the data for the whole year)
- Repeatable (the method must be able to be repeated).
- Maximise accuracy (the most accurate method should be used, i.e. the method should be chosen that minimises the error in the data to be reported)
- Containerised (the volume and weight of material is easier to measure if it is in containers)
- Fewer assumptions the better (assumptions introduce error).

- Hierarchy of methods
- Use the most accurate method for the information available



Material categories

Material categories	
Paper	Organics – Food organics
Cardboard	Organics – Timber / wood
Plastics	Organics – other organics
Metals – Ferrous	Rubber/tyres
Metals – Non-ferrous	Textiles
Glass	Hazardous – asbestos
Concrete	Hazardous - batteries
Bricks	Hazardous - other
Soil, sand, clean fill	E-waste
Organics – Garden organics	

Draft Methods – Estimating Waste In & Out by weight

1st preferred method – weighing

$$Annual\ waste = \sum (weight\ of\ waste\ loads)$$

Estimation by weight – data collection

To estimate total waste by weight, the following data must be recorded for each load

- Geographical source (Metro, Peel, Other non-Metro)
- Source waste stream (MSW, C&I, C&D)
- Material category
- Weight of the load – weighed on a weighbridge

Example – Estimation of waste **received** by weight

Data collected at weighbridge

Load In	Geographical source	Source waste stream	Material category	Weight (tonnes)
Load 1	Metro	MSW	Co-mingled recycling	3
Load 2	Peel	C&I	Cardboard	2.5
Load 3	Other Non-metro	C&I	Co-mingled recycling	4
Load 4	Metro	C&I	Cardboard	1.5
Load 5	Metro	MSW	Co-mingled recycling	2.5
Load 6	Metro	MSW	Co-mingled recycling	3.5
Load 7	Peel	MSW	Co-mingled recycling	4
Load 8	Other Non-metro	MSW	Co-mingled recycling	8
Load 9	Metro	C&I	Cardboard	3.2
Load 10	Metro	C&I	Co-mingled recycling	3
TOTAL				35.2

Data reported to DWER

Geographical Source	Waste Stream	Material	Weight (tonnes)
Metro	C&I	Cardboard	4.7
Metro	C&I	Co-mingled recycling	3
Metro	MSW	Co-mingled recycling	9
Other Non-metro	C&I	Co-mingled recycling	4
Other Non-metro	MSW	Co-mingled recycling	8
Peel	C&I	Cardboard	2.5
Peel	MSW	Co-mingled recycling	4
TOTAL			35.2

Example – Estimation of waste **exported** by weight

Data collected at weighbridge

Load Out	Geographical Destination	Fate	Material category	Weight (tonnes)
Load 1	WA	Recycling	Plastic	10
Load 2	Interstate	Recycling	Cardboard	20
Load 3	Overseas	Recycling	Plastic	30
Load 4	Overseas	Recycling	Cardboard	20
Load 5	Overseas	Recycling	Cardboard	20
Load 6	Interstate	Recycling	Cardboard	20
Load 7	Overseas	Recycling	Plastic	30
Load 8	WA	Recycling	Glass	25
Load 9	Overseas	Recycling	Plastic	20
Load 10	WA	Landfill	Mixed waste	35
TOTAL				230

Data reported to DWER

Fate	Geographical destination	Material category	Weight (tonnes)
Landfill	WA	Mixed waste	35
Recycling	Interstate	Cardboard	40
Recycling	Overseas	Cardboard	40
Recycling	Overseas	Plastic	80
Recycling	WA	Glass	25
Recycling	WA	Plastic	10
TOTAL			230

Draft Methods – Estimating Waste In & Out by Volume

2nd preferred method – estimation of volume and convert to weight

$$Annual\ waste = \sum (volume\ of\ waste\ load) \times (density\ of\ waste)$$

Estimation by volume – data collection

To estimate total waste by volume and convert to weight, the following data must be recorded for each load

- Geographical source (Metro, Peel, Other non-Metro)
- Source waste stream (MSW, C&I, C&D)
- Material category
- Volume of the load
- Density of the material / load
  - Either facility's own figures or use default values

Example – Estimation of waste **received** by volume, converting to weight

Data collected at gatehouse / entrance

Load	Load volume (m^3)	% fullness	Geographical source	Source waste stream	Material category	Material bulk density (t/m^3)	Weight (tonnes)
Load 1	15	100%	Metro	MSW	Co-mingled recycling	0.063	0.95
Load 2	20	100%	Non-metro	C&I	Cardboard	0.1	2.00
Load 3	1	100%	Metro	C&I	Cardboard	0.1	0.10
Load 4	20	100%	Metro	C&I	Co-mingled recycling	0.1	2.00
Load 5	15	100%	Peel	MSW	Co-mingled recycling	0.063	0.95
Load 6	10	80%	Metro	C&I	Cardboard	0.1	0.80
Load 7	5	70%	Metro	C&I	Cardboard	0.1	0.35
Load 8	12	100%	Peel	C&I	Cardboard	0.1	1.20
Load 9	20	100%	Non-metro	MSW	Co-mingled recycling	0.063	1.26
Load 10	20	100%	Metro	C&I	Cardboard	0.1	2.00
TOTAL							11.60

Data reported to DWER

Geographical Source	Waste Stream	Material category	Weight (tonnes)
Metro	C&I	Cardboard	3.25
Metro	C&I	Co-mingled recycling	2
Metro	MSW	Co-mingled recycling	0.945
Non-metro	C&I	Cardboard	2
Non-metro	MSW	Co-mingled recycling	1.26
Peel	C&I	Cardboard	1.2
Peel	MSW	Co-mingled recycling	0.945
TOTAL			11.6

Example – Estimation of waste **exported** by volume, converting to weight

Data collected at gatehouse / exit

Load out	Load volume (m^3)	% fullness	Geographical destination	Fate	Material category	Material bulk density (t/m^3)	Weight (tonnes)
Load 1	40	100%	Overseas	Recycling	Plastic	0.1	4
Load 2	40	100%	Interstate	Recycling	Cardboard	0.13	5.2
Load 3	20	100%	Overseas	Recycling	Cardboard	0.13	2.6
Load 4	20	100%	Overseas	Recycling	Metal	0.5	10
Load 5	30	100%	Overseas	Recycling	Metal	0.5	15
Load 6	20	80%	Overseas	Recycling	Cardboard	0.13	2.08
Load 7	20	70%	Local	Recycling	Plastic	0.1	1.4
Load 8	40	100%	Overseas	Recycling	Cardboard	0.13	5.2
Load 9	20	100%	Interstate	Recycling	Paper	0.2	4
Load 10	40	100%	Local	Landfill	Mixed putrescible	0.4	16
TOTAL							65.48

Data reported to DWER

Fate	Destination	Material category	Weight (tonnes)
Landfill	Local	Mixed putrescible	16
Recycling	Interstate	Cardboard	5.2
Recycling	Interstate	Paper	4
Recycling	Local	Plastic	1.4
Recycling	Overseas	Cardboard	9.88
Recycling	Overseas	Metal	25
Recycling	Overseas	Plastic	4
TOTAL			65.48

Draft Methods – Estimating Stockpiles

1st preferred method – weight mass balance

$$Weight_{stockpile} = Weight_{original} + Weight_{received} - Weight_{left\ site} - Weight_{contamination\ removed}$$

- Need to know the amount in the stockpile at the start of the financial year.

2nd preferred method – estimation of volume and convert to weight

$$Weight_{stockpile} = (volume\ of\ waste) \times (density\ of\ waste)$$

Determining source of waste

- Record information for each load at the gatehouse
- Infer from / ask regular customers
- Infer from type of vehicle (e.g. Council recycling truck)
- Conduct regular surveys (four per year)

- NB: C&D Recyclers can assume all waste is C&D waste.

Draft Methods – Bulk Densities

- Measure bulk density - average
- Bulk density survey
- Use “default values”

Material category	Default bulk density (t/m^3)
Paper	0.2
Cardboard	0.1
Plastics	0.14
Metals – Ferrous	0.5
Metals – Non-ferrous	0.14
Glass	0.347
Concrete	1.5
Bricks	1.2
Soil, sand, clean fill	1
Organics – Garden organics	0.15
Organics – Food organics	0.5
Organics – Timber / wood	0.19
Organics – other organics	0.3
Rubber/tyres	0.3
Textiles	0.15
Hazardous – asbestos	0.31
Hazardous – other	0.2
Mixed co-mingled recyclables (uncompacted)	0.063
Other / mixed - putrescible	0.3
Other /mixed - inert	1.3

Draft Default Values – Vehicle Volumes

If volume of load is unknown and too difficult to obtain, default values can be used.

Vehicle type	Assumed volume (m^3)
Small vehicle (car, ute, van, trailer)	1
Open truck - small, 2 axles	3
Open truck - large 2 axles	6
Open truck - 3 axles	10
Open truck - 4 axles	12
Open truck - 5 axles	18
Open truck - 6 axles	20
Open truck - 8 axles	20
Open truck - 9 axles	32
Open truck - 11 axles	40
Compactor truck - volume unknown	10

Alternative methods

- Facilities can propose alternative methods for estimating any parameter
  - Weights received, disposed and leaving the site
  - Bulk densities
  - Source of waste
- Any alternative methods proposed must be accurate, repeatable and consistent.
- Alternative methods must be approved by DWER

Feedback

- Consultation webpage on DWER website

  https://www.der.wa.gov.au/our-work/consultation/524-open-consultation-approved-method

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