



**FIRE +  
RESCUE**

BUILDINGS WITH UNIQUE HAZARDS

# **FIRE SAFETY IN WASTE RECYCLING FACILITIES**

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# OUTLINE

1. Waste Recycling Facilities
2. Unique hazards
3. Firefighting considerations
4. Draft Fire Safety Guideline
5. Consultation process
6. Summary



**FIRE +  
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# 01. WASTE RECYCLING FACILITIES

A waste recycling facility can encompass any stage of the recycling or materials recovery process, including material collection, storage, transfer, treatment, processing and conversion.



# 01. WASTE RECYCLING FACILITIES



A waste recycling facility can include:

- recyclable collection or transfer stations (e.g. public recycling stations)
- resource recovery centres (segregates unsorted co-mingled waste)
- materials recycling facilities (processes domestic recycled materials)
- reprocessors (conversion back to raw material state e.g. paper, plastics)
- recyclers (recycling of materials/products e.g. metals, timber, tyres, e-waste)
- energy conversion (e.g. furnace, alternative fuel conversion or bioreactor).

# 01. WASTE RECYCLING FACILITIES

Historically FRNSW has attended numerous fires at waste recycling facilities.

These fires are often quite large and have a detrimental impact on firefighting intervention, the environment, local community and the waste recycling industry itself.



## 02. UNIQUE HAZARDS

Processes undertaken at waste recycling facilities have higher risks than for other industries and will often result in greater frequency and severity of fires.



## 02. UNIQUE HAZARDS

A fire involving bulk storage of mixed, loose combustible material presents a high and volatile fire load and causes significant challenges to firefighting intervention.





## 02. UNIQUE HAZARDS

Waste recycling fires in NSW have demanded significant FRNSW resources and intervention over multiple days to extinguish the fire.





## 02. UNIQUE HAZARDS

The largest and longest-lasting fires often involve large piles of unsorted waste with inadequate separation, where physical removal, separation and extinguishment is required.



# 01. WASTE RECYCLING FACILITIES

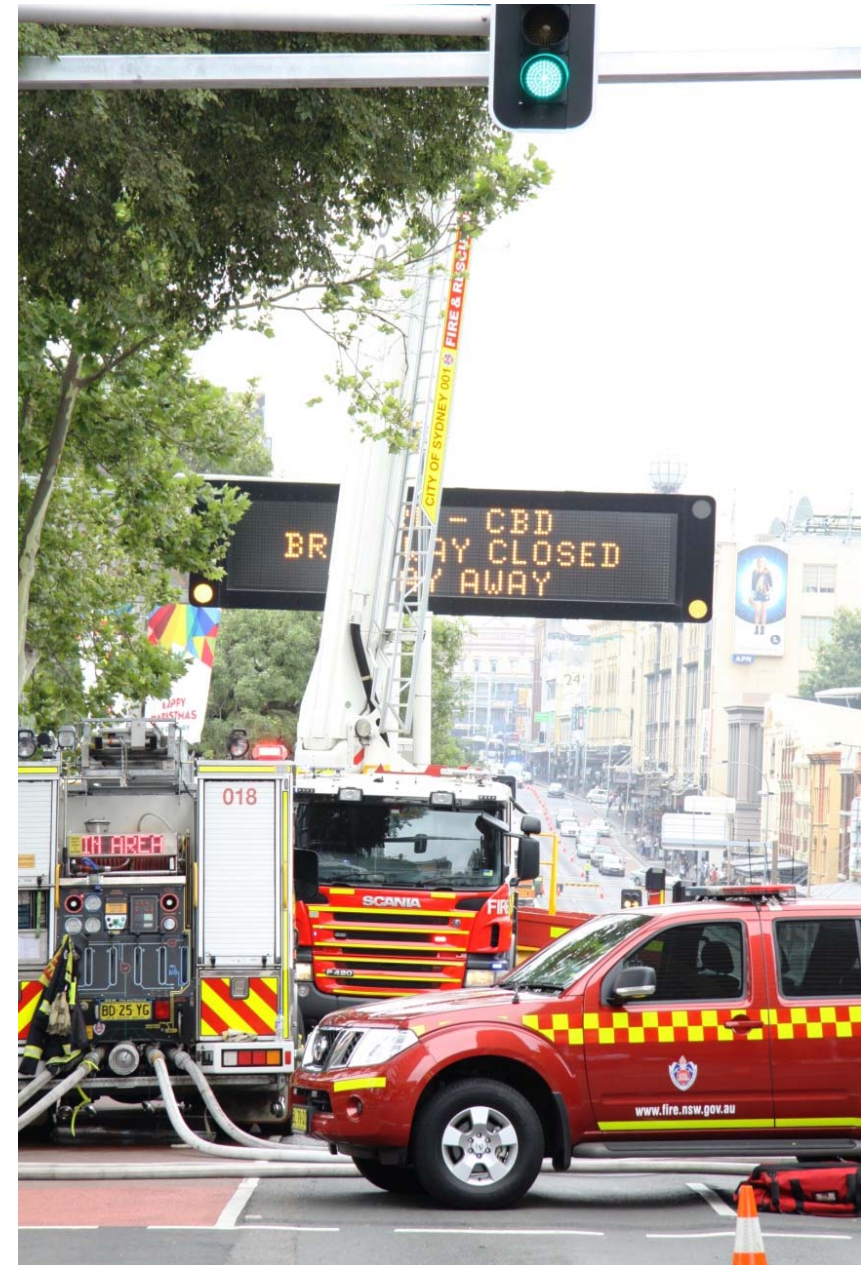


The potential fire size correlates with:

- the nature of the waste and renewable materials being processed
- stockpile arrangements
- on-site fire safety systems
- emergency procedures that are specific to each facility

## 02. UNIQUE HAZARDS

Waste therefore presents 'special problems of firefighting' that warrant classification as 'special hazards', and the consideration of provision for special hazards under Clause E1.10 and E2.3 of the NCC.





### 03. FIREFIGHTING CONSIDERATIONS

Waste recycling fires present specific issues for firefighting, including:

- a) the physical nature of waste and by-products, including fire properties and ignition potential of both unsorted and sorted materials
- b) unsuitable storage method, stockpile size, separation distances and accessibility
- c) mechanised waste handling, sorting and processing systems, including vehicles



### 03. FIREFIGHTING CONSIDERATIONS

Waste recycling fires  
present specific issues for  
firefighting, including:

- d) poor emergency  
vehicle and/or firefighter  
access for firefighting  
intervention
- e) facilities having an  
inadequate or no fire  
hydrant system, including  
water capacity
- f) facilities having an  
inadequate automatic fire  
suppression system  
installed





### 03. FIREFIGHTING CONSIDERATIONS

Waste recycling fires present specific issues for firefighting, including:

- g) buildings having an inadequate smoke hazard management system installed, and
- h) facilities having inadequate provision to contain contaminated fire water run-off.





# 04. DRAFT FIRE SAFETY GUIDELINE

FRNSW have prepared  
a draft Fire Safety  
Guideline



Fire safety guideline

## Fire safety in waste recycling facilities



Version 01 Draft E  
Issued 10 May 2018

Fire Safety Branch  
Community Safety Directorate



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# 04. DRAFT FIRE SAFETY GUIDELINE



## PURPOSE

Provide guidance on fire safety in waste recycling facilities, including fire safety systems which facilitate:

- firefighting intervention
- protecting life safety from the risks of fire
- protecting the environment from the risks of fire.



# 04. DRAFT FIRE SAFETY GUIDELINE



## APPLICATION

This guideline applies to any facility within a fire district involved in the storage, treatment and handling of combustible waste and other by-products for recycling renewable materials.





# 04. DRAFT FIRE SAFETY GUIDELINE



## APPLICATION

Intended to be used by any consent or regulatory authority determining any relevant facility



# 04. DRAFT FIRE SAFETY GUIDELINE



## LEGISLATED REQUIREMENTS

- Protection of the Environment Operations Act 1997
- Environmental Planning and Assessment Act 1979
- Work Health and Safety Act 2011
- National Construction Code





## 04. DRAFT FIRE SAFETY GUIDELINE



### ACCESS FOR FIRE BRIGADE INTERVENTION

- Safe, efficient and effective access for emergency vehicles as detailed in FRNSW guideline *Access for emergency vehicles*
- Perimeter ring road around buildings and access roads between external storage stockpiles





# 04. DRAFT FIRE SAFETY GUIDELINE



## FIRE HYDRANT SYSTEM

- Designed and installed to AS 2419.1-2017 and have an enhanced standard of performance appropriate to special hazards
- Ring main
- External fire hydrants to protect open yard storage (i.e. external stockpile)
- Minimum water supply and capacity (e.g. storage tank) appropriate to the total hydraulic discharge of the worst-case fire scenario



# 04. DRAFT FIRE SAFETY GUIDELINE



## AUTOMATIC FIRE SPRINKLER SYSTEMS

- Required if the building has a floor area greater than 1000 m<sup>2</sup> or contains 200 m<sup>3</sup> or more of combustible waste material
- FRNSW recommends AS 2118.1-2017
- Appropriate to the risks and hazards identified for buildings, including externally as necessary





# 04. DRAFT FIRE SAFETY GUIDELINE



## FIRE DETECTION AND ALARM SYSTEMS

- Installed appropriate to the risks and hazards identified
- FRNSW recommends AS 1670.1-2015
- Occupant warning
- Activation of fire safety measures
- Manual alarm points





# 04. DRAFT FIRE SAFETY GUIDELINE



## SMOKE HAZARD MANAGEMENT

- Appropriate to the potential fire load and smoke production rate within the building
- Under Clause E2.3 of the NCC, the system is to have additional capacity to vent or exhaust smoke so that in at least 90% of the compartment the smoke layer does not descend below 4 m above floor level or the maximum waste storage height plus one metre, whichever is the greater



# 04. DRAFT FIRE SAFETY GUIDELINE



## FIRE WATER CONTAINMENT

- Effective and automatic means of containing contaminated fire water run-off, with primary containment having a net capacity not less than the total hydraulic discharge of the worst-case fire
- Pollution control equipment



# 04. DRAFT FIRE SAFETY GUIDELINE

## STORAGE AND STOCKPILE MANAGEMENT

- Plan of operations of the facility to identify specific areas, materials, storage methods, fire safety systems, etc.
- Stockpiles arranged to minimise fire spread and permit access for firefighting intervention
- Any hazardous materials located at the facility are to be stored separately and in accordance with any relevant regulatory requirement, code or standard





# 04. DRAFT FIRE SAFETY GUIDELINE



## STOCKPILE MOVEMENT

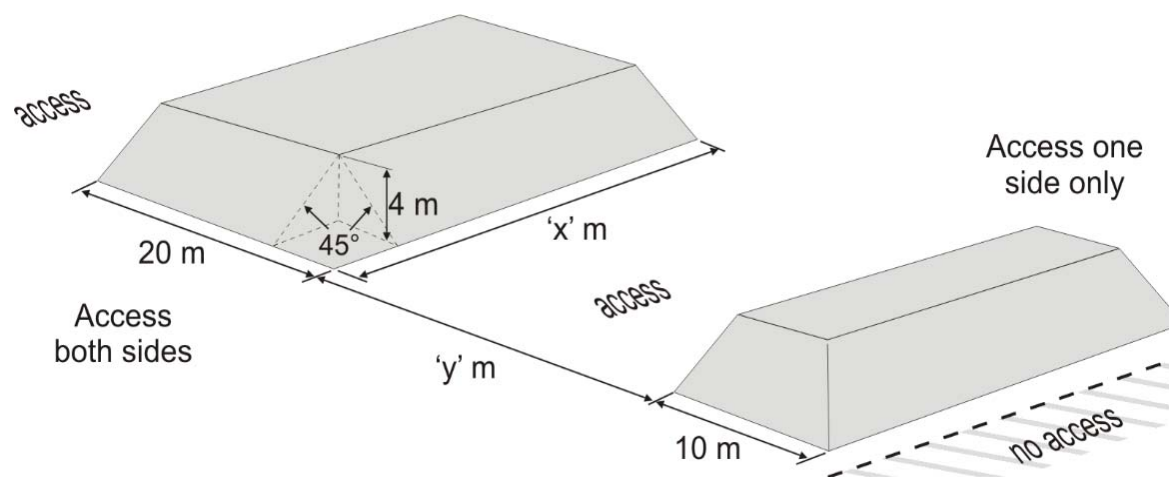
- Operations plan that ensures rotation of stockpiles
- Address risks of heat generation and self-combustion



# 04. DRAFT FIRE SAFETY GUIDELINE

## MAXIMUM STOCKPILE SIZE AND MINIMUM SEPARATION

- The maximum height of a stockpile is 4 m
- The maximum internal stockpile size is to be limited to 450 m<sup>3</sup>, with a minimum 6 m separation around each pile



*Maximum external stockpile size and minimum separation*



# 04. DRAFT FIRE SAFETY GUIDELINE



## MAXIMUM STOCKPILE SIZE AND MINIMUM SEPARATION

Length of external stockpile (m)	Separation between stockpiles (m)				Separation from buildings/boundaries (m)			
	Standard HRR		High HRR		Standard HRR		High HRR	
	Loose pile	Baled	Loose pile	Baled	Loose pile	Baled	Loose pile	Baled
10	7	13	15	20	9	12	18	18
15	9	15	20	24	12	14	22	22
20	10	17	21	27	13	15	25	24
30	11	20	26	33	15	17	30	28
50	13	23	31	40	17	20	38	35

*Minimum separation between external stockpiles and buildings*



# 04. DRAFT FIRE SAFETY GUIDELINE

## MAXIMUM STOCKPILE SIZE AND MINIMUM SEPARATION

- The entire stockpile must be able to be moved to a designated external quarantine area using on-site resources only within eight hours or less.
- For example, a facility having two waste handlers with 5 m<sup>3</sup> bucket capacity operating at 80% load, taking four minutes per return trip, can have a maximum stockpile size of 960 m<sup>3</sup> (i.e. 2 x 5 m<sup>3</sup> x 80% x 120 trips in an eight hour period).



# 04. DRAFT FIRE SAFETY GUIDELINE



## OUTDOOR STORAGE

- Appropriate emergency vehicle access is to be provided between external stockpiles, including to hardstands provided for external fire hydrants protecting outdoor storage

## INDOOR STORAGE

- A dedicated external quarantine area is to be provided to receive, breakdown and extinguish the largest total internal storage of material from any building of the facility

# 04. DRAFT FIRE SAFETY GUIDELINE

## WORKPLACE FIRE SAFETY

- Risk assessment and mitigation
- A fire safety plan which includes an emergency plan to AS 3745–2010 *Planning for emergencies in facilities*
- Emergency services information package (ESIP)
  - as detailed in FRNSW guideline *Emergency services information package and tactical fire plans*
  - *The ESIP is intended for use by emergency services only and supplements the emergency plan which is for staff*





# 04. DRAFT FIRE SAFETY GUIDELINE

## APPENDIX A – FRNSW ACCEPTABLE SOLUTION

- This FRNSW acceptable solution intends to assist consent authorities make determination on a proposed waste recycling facility without specific referral to FRNSW
- This acceptable solution applies to the case of a typical ‘resource recovery centre’ or ‘materials recycling facility’ where domestic co-mingled recyclable waste is sorted, segregated and/or processed. For any other case, a holistic assessment is required



# 04. DRAFT FIRE SAFETY GUIDELINE

## APPENDIX A – FRNSW ACCEPTABLE SOLUTION


Performance requirement	Description of provision	Guideline reference
CP9	Perimeter vehicular access complying with Clause C2.4(b) of the NCC and FRNSW guideline <a href="#">Access for emergency vehicles</a> is provided.	Section 7.1
EP1.3	A fire hydrant system is installed to Australian Standard AS 2419.1 and covers both internal and external stockpiles.	Clause 7.2.1
EP1.3	The fire hydrant system incorporates a ring main design for redundancy.	Clause 7.2.1
EP1.3	Fire hydrants are not within 10 m of any stockpiled storage (or vice versa), whether being internal or external.	Clause 7.2.4
EP1.3	The fire hydrant system delivers not less than 50 L/s for a minimum of four hours duration.	Clause 7.2.7
EP1.3	The minimum water supply capacity for the fire hydrant system is not less than 720,000 litres, either by way of full capacity tanks or reduced capacity tanks with infill from a town-main.	Clause 7.2.8
EP1.4	A fire hose reel system is installed to Australian Standard AS 2441 and covers both internal and external stockpiles (i.e. first attack firefighting by staff).	Clause 7.2.9
EP1.5	An automatic fire sprinkler system is installed to Australian Standard AS 1869.1 and designed for the excessive hazard (e.g. 'high hazard' class) as a minimum.	Clause 7.3.1
EP1.5	The fire sprinkler system delivers not less than peak hydraulic demand for a minimum of four hours duration.	Clause 7.3.6
EP2.1	A fire detection and alarm system is installed to Australian Standard AS 1869.1 and designed for the fire scenarios and environment (e.g. visual flame detectors, infrared detectors, aspirating system, smoke probes).	Clause 7.4.1
EP2.1	Manual alarm points are installed for manual alarm.	Clause 7.4.4
EP2.2	An automatic smoke hazard management system is installed and designed so the smoke layer does not descend below 4 m above floor level or maximum waste stock height, whichever is the greater, to a minimum of one metre in at least 90% of the compartment.	Clause 7.5.1
EP2.2	The automatic smoke hazard management system is capable of continuous operation for a minimum of four hours duration.	Clause 7.5.4
N/A	An automatic water run-off containment system is provided and will contain the combined designed water supply of the fire hydrant and sprinkler system.	Clause 7.6.1
N/A	Pollution control equipment is provided to divert fire water run-off and isolate stormwater drainage in the event of failure of the fire water run-off containment system (including overflow).	Clause 7.6.4
N/A	An operations plan is to be implemented for stockpile management including pile movement, temperature monitoring, maximum pile size and minimum pile separation. This plan is to be included within the fire safety plan of the facility and the Emergency Services Information Package (ESIP) for firefighters.	Clause 8.1.2
N/A	Stockpile sizes and minimum separations do not exceed the requirements given in section 8 of the FRNSW guideline Fire Safety in waste recycling facilities, including indoor stockpiles not exceeding 450 m³.	Section 8.3
CP9	Emergency vehicle access is provided between external stockpiles.	Clause 8.4.3
N/A	An Emergency Services Information Package (ESIP) is provided for firefighters in accordance with FRNSW guideline Emergency services information package and tactical fire plans.	Section 9.3



## 05. CONSULTATION PROCESS



- Home
- About us
- Incidents & emergency warnings
- Recruitment & volunteering
- Fire safety**
  - Community fire safety
  - Building fire safety**
    - Certifiers
    - Engineers and consultants
    - Business and undertakings
    - Compliance and regulation
    - Guidelines and information**
    - Automatic Fire Alarm Servi...
    - Online Payments
  - Workplace fire safety
  - Educational resources
- Media centre
- Contact us



Home > Fire safety > Building fire safety > Guidelines and information > Current consultations

## CURRENT CONSULTATIONS

Fire & Rescue NSW (FRNSW) documents that have a public or regulatory impact will be made available for public consultation for a period of not less than 28 days. FRNSW will endeavour to notify all key primary stakeholders of the opportunity to submit comments during this formal consultation period. Public comment is currently open on the following documents:

Document name	Date published	Submissions close
No current documents		

All submissions must be received by the submission period closing date. To make a submission please download the [submission template](#). Complete all relevant details and return your submission to [consult.firesafety@fire.nsw.gov.au](mailto:consult.firesafety@fire.nsw.gov.au).

Submissions received may be made publicly available. If you do not want your personal details released, please indicate this clearly in your submission. Any specific information that you do not wish to be made available to the public should be clearly marked 'in confidence'. Submissions are subject to all relevant laws such as the [Government Information \(Public Access\) Act 2009](#) and the [Privacy and Personal Information Protection Act 1998](#).

**Note:** If you would like to be advised when FRNSW releases a documents for public consultation, please [subscribe](#) to receive notifications.

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Local Feedback



## 06. SUMMARY

- FRNSW has attended numerous fires at waste recycling facilities
- Consideration of provision for special hazards under Clause E1.10 and E2.3 of the NCC
- FRNSW Fire safety guideline
- Consultation:

[www.fire.nsw.gov.au](http://www.fire.nsw.gov.au)

Home > Fire safety > Building fire safety >  
Guidelines and information > Current consultations



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