EPA
South Australia

Guideline for stockpile management

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ISBN 978-1-921125-91-8

Issued September 2010

Updated October 2020

Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

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Summary

This guideline outlines the potential risks associated with the stockpiling of materials (waste or other matter) and provides guidance on appropriate stockpile management and relevant controls to reduce those risks.

The Environment Protection Authority (EPA) expects persons undertaking stockpiling to have regard to this guideline as it is used to determine whether any facility or operator are meeting provisions in the *Environment Protection Act 1993.* This includes their general environmental duty to take all reasonable and practicable measures to prevent or minimise environmental harm, and promote the circulation of materials through the waste management process; and preventing unauthorised stockpiling of waste or other matter.

1 Introduction

Stockpiling can result in harm to human health and environmental harm, for example through stockpile fires and exposure of the community to smoke and dust, as well as creating a financial liability that can be passed onto the community and governments if a site is abandoned.

Section 25 of the *Environment Protection Act 1993* (EP Act) is a general environmental duty (GED) for everyone to take all reasonable and practicable measures to prevent or minimise environmental harm.

In accordance with the Objects of the EP Act (section 10), the Environment Protection Authority (EPA) requires that stockpiling is conducted in an appropriate manner so that the risk of harm to human health and the environment is prevented or minimised, and so that materials are circulated through the waste management process to support a strong market for recovered resources.

This guideline sets out the EPA's minimum expectations for the management of potential risks, and it addresses issues related to on-site layout, stability and dimensions of stockpiles, material flow and timeframes for storing waste or other matter.

Storage or stockpiling should be temporary and undertaken only in suitable circumstances for genuine and beneficial purposes.

2 Application of the guideline

2.1 Scope

This guideline is for anyone stockpiling materials (waste or other matter) and provides guidance to take all reasonable and practicable measures to prevent or minimise environmental harm, and to promote the circulation of materials through the waste management process. This includes facilities that conduct prescribed activities of environmental significance and require an EPA environmental authorisation, under Schedule 1 of the EP Act.

In this guideline, materials can be waste or other matter and includes but is not limited to:

- materials destined for disposal
- waste awaiting processing, recycling or reuse
- waste soil
- building rubble and material excavated from roads
- virgin material excavated at a site for on-site use
- organics
- secondary or residual materials from industrial activities or waste processing (secondary or residual wastes)
- e-waste
- other potentially contaminated waste or other matter[1].

This guideline is not intended to be exhaustive in addressing every material. The materials listed tend to be the main types of materials that are currently stockpiled and give rise to environmental, material flow or abandonment risks.

Materials not specifically identified in this guideline may have extra requirements for their storage, in addition to the requirements in this guideline. Refer to Appendix 4 for further sources of information with specific requirements for radioactive wastes, treated timber and quarantine wastes.

Guiding documentation regarding the suitability of a range of wastes or other materials are listed in Appendix 4, including requirements for being recognised as a product produced to a consistent specification that is fit for purpose, has an immediate market, will not cause harm and is for genuine and beneficial purpose.

The guideline does not specifically address issues regarding liquid waste storage. The *Environment Protection (Water Quality) Policy 2015* offers specific protection for the state's waters and prohibits the pollution of the stormwater system and our natural waters.

Further information on storing liquids to prevent pollution of waterways can be found *Bunding and spill management* and *Liquid waste classification test*.

2.2 Legislation

This guideline will assist in determining whether operators of facilities are meeting their general environmental duty (GED) by taking all reasonable and practical measures to prevent or minimise environmental harm (section 25 of the EP Act), and are meeting their obligations under the Objects of the Act (section 10) including:

> 'to promote the circulation of materials through the waste management process and to support a strong market for recovered resources by –

[1] A contaminant includes physical and chemical substances and these may have the potential to cause site contamination (refer to Appendix 3).

(A) programs to encourage and assist industry, public authorities and the community to engage in resource recovery; and

(B) regulating resource recovery; and

(C) regulating the handling, storage, treatment, transfer, transportation, receipt or disposal of waste or other matter; and

(D) preventing the unauthorised stockpiling of waste or other matter;'

For the purposes of section 3(5) of the EP Act (Section 3(5)), unauthorised stockpiling of waste or other matter will be taken to have occurred if a maximum allowable stockpile limit (stockpile limit) imposed by or under the Act, through a condition of authorisation, has been exceeded.

Under Schedule 1, prescribed activities of environmental significance[2] require both an environmental authorisation, in the form of a licence from the EPA, and development authorisation under the *Planning, Development and Infrastructure Act 2016*. For example, the conduct of waste receipt, waste recovery, waste reprocessing and waste disposal are prescribed activities of environmental significance. Schedule 1 also sets out some exceptions to the requirements for a licence.

The *Environment Protection (Waste to Resources) Policy 2010* indicates that stockpiling of waste or other matter may be considered disposal and contains requirements on how waste must be disposed of, with specific penalties for unlawful disposal of waste including illegal dumping. The *Environment Protection (Water Quality) Policy 2015* offers specific protection for the state's waters and prohibits the run off and leachate from stockpiles from polluting the stormwater system and our natural waters.

Stockpile management considerations and legislative mechanisms detailed in this guideline are shown schematically in Figure 1.

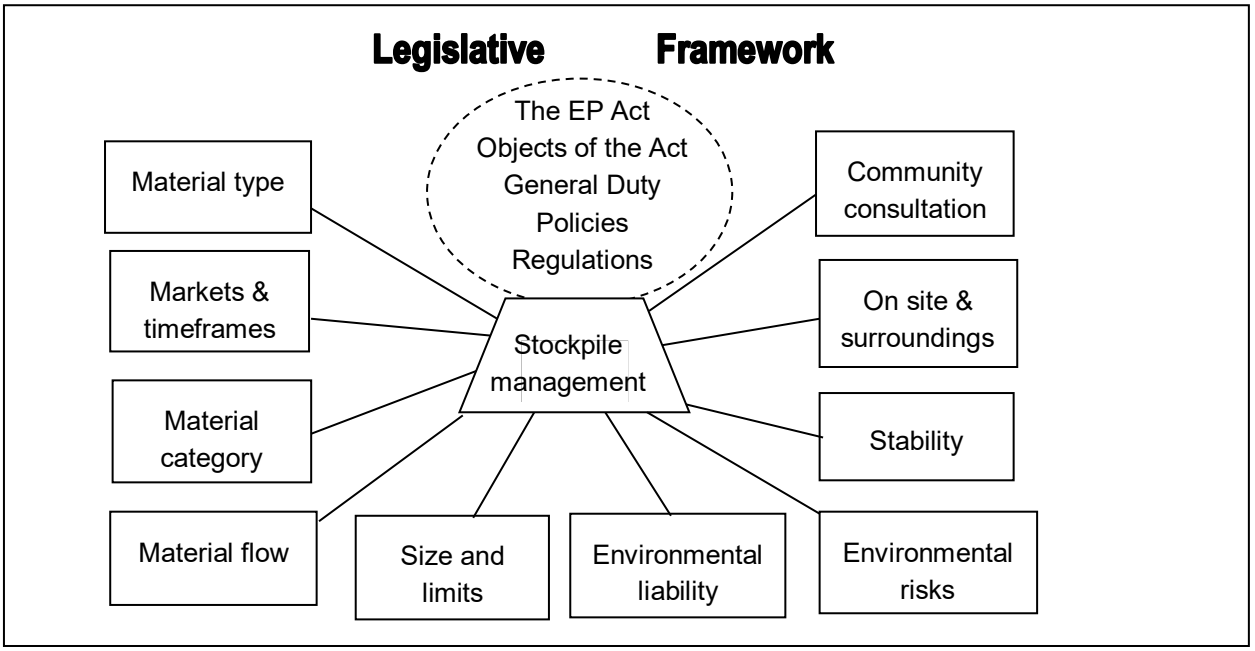

Figure 1 Considerations for the assessment and management of stockpiles

[2] Unless the exceptions listed in activity 3(3) of Schedule 1 of the *Environment Protection Act 1993* apply.

2.3 Guiding principles

Based on the Objects of the EP Act, the EPA will be guided by the following principles to ensure control measures for stockpiling materials:

- act as an incentive to improve environmental performance
- support a strong market for recovered resources
- are risk based, reasonable and practicable
- provide regulatory certainty
- provide a fair and proportionate response to inappropriate stockpiling where there is a risk of harm to human health and the environment, and to ensure that material flows in accordance with the waste management hierarchy (refer to risk descriptions in Table 1).

2.4 Objectives

Through these principles, the key EPA objectives are to:

- prevent or minimise the risk of harm to the environment and human health
- support the most preferable use of waste and secondary materials in accordance with the waste management hierarchy
- ensure materials will be circulated through appropriately authorised waste management processes to support a strong market for recovered resources
- reduce the environmental liability for stockpiled materials and the risk of abandonment
- provide a fair and proportionate response to inappropriate stockpiling to ensure appropriate material flows in accordance with the waste management hierarchy
- ensure stockpiling is not used as a means to avoid waste compliance and authorisation obligations.

The following EPA publications (also see Appendix 4) provide further information on the regulatory and policy framework and the principles that must be considered for managing materials in accordance with the EP Act and the waste management hierarchy:

- *Standard for the production and use of waste derived fill*
- *Financial assurances and stockpiling – who, when, what and how much*
- *Compost guideline*
- *Evaluation distances for effective air quality and noise management*
- *Undercover storage requirements for waste/recycling depots*
- *Environmental management of landfill facilities – solid waste disposal*
- *Waste Levy regulations*.

2.5 EPA assessments

The guiding principles and guidelines are used by the EPA when:

- assessing whether development proposals referred to the EPA, under section 57, would meet the requirements of the EP Act, including seeking to further the Objects of the Act (section 10) such as to promote the circulation of materials through the waste management process and to support a strong market for recovered resources.
- assessing licence applications and determining conditions of authorisations including assessing whether maximum allowable stockpile limits and financial assurances are required

- assessing environment management plans, including stockpile management plans (refer to Appendix 2)
- pursuing compliance with environmental authorisations
- assessing proposals for exemptions from requirements of the EP Act or similar
- assessing and monitoring compliance with the EP Act (including the general environmental duty and action following substantiated complaints) once approval has been given for stockpiling.

When undertaking these assessments, the EPA considers a range of risk factors, which are set out in sections 3 and 4 of this guideline, with further details provided in Appendix 1.

3 Potential risks and impacts

3.1 Factors that affect risk

Where specific EPA approval is required, operators need to consider in detail a range of factors to ensure a robust risk assessment is conducted, and acceptable site and stockpile management measures and procedures are put in place.

Risks need to be considered by any operator regardless of whether a licence is required for the specific activity.

Risks will depend on factors such as:

- type of material being stockpiled (the material risk category)
- chemical and physical characteristics of the material
- location and climate of the site
- hydrological and hydrogeological conditions including proximity to surface and groundwaters, water quality and protected environmental values
- length of time materials will be stored
- proposed management approach of the stockpiled materials
- material flow at a site including timeframes for circulating material through the waste management process
- whether the material has an immediate fate, and market conditions
- magnitude of a stockpile's environmental liability and the potential abandonment of the stockpiles (refer to section 3.2)
- avoidance of waste compliance and authorisation obligations

Additional off-site risks to be considered and depend on the following factors:

- proximity to and sensitivity of the surrounding environment (including adverse impact to water, human health and amenity)
- exposure due to elevation in metres AHD[3] of the working floor level which the stockpile is situated upon and relative to the surrounding environment
- implementation of appropriate air, surface water and groundwater pollution controls
- potential air quality impacts as a result of stockpile fires
- management of traffic in and around the site.

Specific guidance for key risk factors is provided in section 4. A comprehensive list of risks, factors affecting risk and general suggested measures is included in Appendix 1.

3.2 Unauthorised stockpiling and abandonment risk

The level of risk associated with material flow and abandonment, is dependent on the type of material. The risk level for each category of material is summarised in Table 1.

Materials have a higher risk of being stockpiled inappropriately and abandoned when the material is not recoverable or has untested and unproven markets. Further information on how the EPA assesses material flow risk and the material categories of risk can be found in the information sheet *Financial assurances and stockpiling – who, when, what and how much*.

[3] Australian Height Datum (mAHD) is the national level datum based on the average means sea level around the Australian coastline in metres.

Table 1 Material risk categories depending on the level of material flow and abandonment risk

Material risk category[4]	Example materials	Risk description	Risk level
A. Material that is not recoverable (may need further processing prior to final disposal)	• materials for disposal at landfill • materials for other forms of final disposal • hazardous materials (listed waste)	Risk of illegal dumping and waste levy avoidance	High risk  Low risk
B. Materials that have untested or unproven markets	• industrial residues • mixed commercial and industrial materials • residual wastes	Given the lack of established market or clearly identified future market, the abandonment risks are very high for these materials	
C. Materials that cost to recycle	• e-waste • tyres • mixed construction and demolition waste • co-mingled recyclables	Some of these materials are known to be recyclable and contain recyclable components. However, collection, processing and transport costs exceed any value that will be obtained from the recovery of materials in the wastes, leading to higher abandonment risks.	
D. Materials are a product and meet a published or EPA standard* but are being stockpiled and therefore have no immediate fate, there is a market, but it is limited or highly variable, or anticipating the market to improve *Evidence of the material's physical or chemical properties provided to the EPA and approved	Larger volumes of established recyclables such as: • sorted plastic • cardboard and paper • compost/mulch • mixed glass • inert construction and demolition or waste soil ready for sale • recyclable metals	As there is a market, there is a lower risk of abandonment and lower liability. However, the market may be limited and highly variable. This may lead to speculative stockpiling which can undermine and distort the market. This behaviour is inconsistent with the Objects of the EP Act to promote the circulation of materials through the waste management process and to support a strong market for recovered resources. This behaviour is to be monitored to minimise the environmental liability and to prevent avoidance of regulatory requirements.	
E. Materials that meet a published or EPA standard and have an immediate fate	• pelletised plastics • cardboard and paper • compost/mulch • segregated glass • inert construction and demolition or waste soil ready for sale • recyclable metals.	As there is an established market, there is a lower risk of abandonment and lower liability. At suitable sites, even large volumes of these materials can be stored without posing significant environmental harm or material flow risk.	

[4] Inappropriate storage may lead to material degradation, in which case the EPA may need to classify the material as a higher risk category. For example, cardboard or paper becomes wet due to rain when stored outside.

4 Requirements for managing stockpiles

This section describes the EPA's expectations for the assessment and management of stockpiles at licensed and unlicensed sites. For licensed sites, the EPA may include specific requirements as licence conditions.

The aim is to prevent or minimise the potential for negative impacts on human health and/or the environment, promote material circulation through the waste management process, and reduce environmental liabilities and the risk of abandonment.

The characteristics of the site, material type and risks they pose need to be taken into account when determining the exact management requirements. The required stockpile management and pollution controls to prevent or minimise any adverse impact are described below.

4.1 Managing stockpiles, sites and surroundings

4.1.1 Leachate, dust, odour and litter

- Modern best practices for waste management are undertaken in closed and undercover facilities. The EPA requires all non-inert waste streams to be stored and processed in enclosed undercover facility. This helps to maximise resource recovery and act as a mitigation measure against leachate and potential contamination of surface and underground waters.
- Municipal Solid Wastes, Commercial and Industrial Waste, and Construction and Demolition Waste (Mixed) and e-waste must be stored in an undercover enclosed facility[5] on a sealed[6] and bunded surface while awaiting processing or transfer to a genuine fate and disposal. Mixed wastes stored in undercover areas must only be stored temporarily (refer to sections 4.1.7 NS on *Material flow* and on *Markets and timeframes*).
- Waste types not requiring undercover facilities include Waste Fill, Construction and Demolition Waste (inert), Ferrous and Non-Ferrous Metals, Green Waste and waste tyres. Appropriate management procedures should still be in place and special conditions may be required, including non-permeable surfaces, bunding areas, dust management and stormwater controls to ensure spillages, leaks and emissions are controlled to prevent harm.
- Measures that can be put in place to minimise dust and odour impacts of stockpiles include using dust suppression sprays, fully enclosing stockpiles in sheds, covering stockpiles, using sheds with negative pressure systems and screening.
- Materials with a potential to produce leachate and contaminated runoff should be stored in a sealed and bunded area in order to divert stormwater away from the waste, and contain and prevent impact from potentially contaminated runoff. Covering these materials may also be required to reduce the potential for leachate generation, or to prevent or minimise gaseous or dust or other emissions[7].
- Where wastes or other matter are temporarily stored on the site where they are produced, such as virgin extracted material for on-site use and agricultural manures awaiting reuse or transfer, no specific EPA authorisation is required. For example, farm wastes such as spent litter (straw and wood shavings) from broiler chicken sheds and pig shelters, manure solids separated prior to effluent lagoons on dairies, piggeries and cattle feedlots, can have value as fertilisers or soil enhancers and should not be stockpiled without such a future purpose.
- However, measures in this guideline should be considered to ensure the activity does not cause harm to the environment and/or nuisance to the local community, according to section 25. Emissions control (eg for dust, runoff and leaching) is also of increased importance when managing site contamination, as these sites may present

5 Must have appropriate ventilation and access

6 Sealed with a material of low permeability

7 Refer EPA Guidelines *Bunding and Spill Management* and *Guidelines for environmental management of on-site remediation* and Sheet *Undercover storage requirements for waste/recycling depots*

additional associated risks of causing harm. Further guidance is available for farm waste management, soil remediation sites and biosolids (refer Appendix 4).

For licensed sites, conditions of authorisation may be applied to specifically address these matters and there is further guidance available from the EPA (refer Appendix 4).

4.1.2 Vermin

- In addition to adverse health and amenity impacts from dust, odour and leachate, outdoor stockpiles of materials can also harbour vermin such as rodents and mosquitoes which may lead to the risk of diseases. Controls such as barriers, coverings, minimised storage timeframes and generally good housekeeping should be implemented to help mitigate potential impacts from vermin and invasive species.

4.1.3 Fire

- Materials that can produce heat through degradation (such as organic wastes and other putrescible wastes) should not be stored for long periods and needs to be well aerated to reduce any risk of overheating and spontaneous combustion. Regular internal stockpile temperature monitoring and control can provide information to assist with better management.
- Depending on the size and composition of the stockpile, there should be sufficient spacing between stockpiles and buildings to allow access in case of emergency and to help prevent the spread of fire. This spacing should at least be equal to the height of the stockpile or adequate for emergency vehicle access, whichever is the greater.
- Depending on the size and composition of the stockpile, there should be sufficient vacant space available to move smouldering material to in the event of a fire.
- Depending on the size and composition of the stockpile, flammable or combustible liquids and hazardous wastes should not be stored near to waste stockpiles. Similarly, maintenance and activities that can produce sparks such as welding should be conducted away from waste storage areas.
- All outdoor used tyre storage sites should comply with the General Guidelines for Rubber Tyre Storage (Guideline No. 013) issued by the South Australian Fire Service's Fire Safety Department and the EPA guideline, Waste tyres. Also refer to Tyre Stewardship Australia's Best Practice Guidelines on Tyre Storage and Fire and Emergency Preparedness. Tyre storage in buildings needs to comply with the Building Code of Australia, Part E of Book 1. Refer to local council for further details.
- Persons storing waste or other matter should ensure they are meeting specific requirements for site layout, building design, firefighting equipment, water access, monitoring, management and training as required by Australian Standards (where relevant), and planning and fire authorities.

4.1.4 Site and surroundings

- Materials must be stored away from surface water courses, flood zones and groundwater recharge areas to prevent environmental harm to water. There are obligations and associated offences under the *Environment Protection (Water Quality) Policy 2015* to not discharge waste or a pollutant to land or waters, including through infiltration.
- Managing the storage, removal and reuse of all stockpiled materials must be conducted in a manner that minimises environmental harm including nuisance to the local community. Consideration should be given to larger stockpiles of waste soils and fill materials (ie stockpiled for rehabilitation purposes), which can change topography and therefore change surface drainage patterns.
- The *Evaluation distances for effective air quality and noise management* should be consulted for development proposals to ensure appropriate separation distances to assist in minimising the potential for adverse impacts such as odour, dust, noise and other impacts on amenity.
- Sites should be secured to prevent unauthorised access but allow for entry of emergency vehicles.

- Each stockpile needs to have adequate spacing to allow access for vehicles and materials handling, and attending and reducing the impact of emergency situations such as fire. Areas between stockpiles should be kept free of obstruction and allow easy movement of emergency vehicles.
- On licensed sites, materials should be segregated into discrete and manageable components with clear signage demarcating the various waste storage areas. This includes mixed waste undergoing treatment or processing in undercover areas.

4.1.5 Dimensions and stockpile limits

The EPA may impose or vary a maximum allowable stockpile limit as an authorisation condition, to promote the circulation of materials through waste management processes.

- EPA generally requires that maximum stockpile heights for material management or resource recovery activities be in the range of 3−5 metres. These stockpile height limits are largely based on stockpile manageability, dust impacts, stability, potential impact to underlying infrastructure and fire risk.
- The height of stockpiles should generally be lower than surrounding structures.
- Greater stockpile heights will need careful and adequate assessment of all the additional risks the increased height poses and it must be demonstrated that these risks can be managed.
- In some situations (due to more sensitive nearby locations and uses) environmental risks may be considered higher which may result in the EPA requiring lower stockpile heights.
- Stockpiles should generally be below fence lines when within 5 m of the site boundary.
- The risks posed by specific materials should be considered when determining the suitable width, footprint of each stockpile and the number of stockpiles appropriate for the site area, for example accessibility or risk of fire.
- In the event of an authorisation holder not complying with authorisation conditions, for example if an agreed timeframe for submitting a Stockpile Management Plan or financial assurance is not met, then non-compliance will be escalated in line with the EPA guideline *Compliance and enforcement – Regulatory options and tools*.

4.1.6 Stability

When considering stockpile stability, size and management, the issues that should be considered include:

- Relevant subsurface geology and geotechnical characteristics.
- Structure of the base and sub-base including ability to protect groundwater and susceptibility to dissolution from rainwater or materials held in the stockpile.
- Likelihood of stockpile failure due to:
  - poor design and management including excessive height and side slope gradients
  - decreased internal friction caused by water inundation or gas generation or other pressure on or within the stockpile.
- Proximity to extraneous sources of ground vibrations including railway lines, or other heavy vehicle movements or building activities.
- Materials handling procedures to prevent stockpile collapse.
- Topography of the land where the stockpile is placed.
- Climatic conditions.

4.1.7 Material flow

- The volumes of material required on sites can vary considerably depending on the type of material being stockpiled and the nature of the markets that the activity is supplying or targeting. Stockpiling needs to be conducted with

materials flow and capacity of the site in mind. That is, the stockpiling of materials must not be a process of continual growth, but needs to be a balanced and systematic approach to materials input, processing, output, storage, reuse or sale and removal offsite, to demonstrate responsible and sustainable management for recycling and reuse.

- When materials have a higher risk of being stockpiled inappropriately and abandoned (Table 1), the EPA may require, through conditions of authorisation, a stockpile management plan or SpMP (refer Appendix 2). The SpMP is to demonstrate to the EPA's satisfaction that materials received at the premises will be circulated through appropriately authorised waste management processes. Plans will inform the setting of maximum allowable stockpile limits by condition of authorisation (if required).
- For licensed sites, the EPA may require, through conditions of licence or environment protection orders, reporting on materials flow and mass balances to demonstrate to the EPA's satisfaction that appropriate materials management is in place.
- For waste derived fill (WDF) such as waste soils, maintaining records is a requirement under the *Standard for the production and use of waste derived fill*. Both producers and users must maintain records regarding the source of the material, details of parties involved, volume and destination of soil reused, observations regarding the physical nature of the soil and any laboratory results. The EPA can use its powers under section 87 of EP Act to access the records.

4.1.8 Markets and timeframes

- Storage time and market availability are prime considerations in order to avoid inappropriate and speculative stockpiling of material, minimise the risk of abandonment, and prevent avoidance of regulatory obligations.
- The length of time required for storage of the material needs to be considered carefully and may relate to management procedures in place to manage risks during storage, and how and when the material will be removed for reuse or re-processing. Management plans should be developed and implemented to address any increased risks that extended storage periods may present, and should still be contingent on the existence of a market. This may be required through licence conditions.
- Storage and stockpiling should be considered as temporary measures and there must be no stockpiling for speculative purposes. An immediate market should exist for a material being stored for recycling or reuse. This refers to an identified and recognised market as demonstrated by the existence of a known customer with an established and available beneficial use for the material. The EPA may require a stockpile management plan (refer Appendix 2) to demonstrate to the EPA's satisfaction that materials have an immediate market.
- As a default, for temporary storage of materials prior to reuse, the EPA does not generally support storage or stockpiling of materials awaiting recycling or reuse for longer than 24 months in order to reduce potential abandonments or speculative indefinite stockpiling, and minimise the environmental liability. Importantly, any proposals for storage exceeding this timeframe is required to demonstrate there is a fate for the material ie the existence of the market or buyer. A stockpile management plan is usually required as a condition of authorisation and a financial assurance may also be required. In addition, the EPA may have cause for the operator to transport the material to a licensed landfill or other suitable waste management facility for disposal, treatment or recycling.
- The EPA will consider the availability of markets and timeframes in the context of current available technologies and the legislative environment. However, emerging technologies or speculative markets are considered higher risk.
- Longer storage for certain organic wastes such as manures and sludges may be suitable to allow for stabilisation and drying prior to reuse provided appropriate pollution controls are in place. Storage of biosolids is addressed in the *Guidelines for the safe handling, reuse or disposal of biosolids in South Australia*. Persons storing or stockpiling these materials will still need to consider and address any potential risks posed, such as odour, leachate, dust and vermin.
- In general, at licensed waste management facilities:
  - Municipal Solid Wastes, Commercial and Industrial Waste, Construction and Demolition Waste (Mixed) and putrescible wastes should only be stored temporarily while awaiting processing and/or transfer to a genuine fate and disposal. Municipal Solid Wastes and putrescible waste should be removed daily but storage timeframes

may be acceptable for up to 72 hours, dependent upon the waste and the suitability of the facility design and operation. This is because storage of these wastes for longer periods may result in increased risks particularly to human health and the environment. Considerations such as distance and economies of scale may mean this period is specifically altered in remote areas. Storage timeframes may be specified as a condition of authorisation or a stockpile management plan may be required.

- Inert stockpiles of materials for processing and reuse, eg construction and demolition waste, are normally ongoing activities. However these will still need to operate on a materials flow basis to prevent accumulation of materials with no market or in excess of site or market capacity.

4.2 Other considerations

4.2.1 Financial assurance

- For licensed sites, section 51 of the EP Act gives the EPA the power to require a financial assurance as a condition of authorisation, not only where there is the risk of environmental harm but also where there is a risk of unauthorised stockpiling, or abandonment of waste or other matter (collectively referred to as environmental liabilities for the purposes of this guideline). Under section 3(5) of the EP Act, unauthorised stockpiling of waste, or other matter, occurs if a maximum allowable stockpile limit (stockpile limit) imposed under the EP Act has been exceeded.
- A financial assurance is a type of financial security that can be required by the EPA to prevent the cost of rehabilitation, appropriate disposal and clean-up being inappropriately transferred to third parties, including state government and the community.
- A financial assurance may be required in combination with stockpile limits and/or a Stockpile Management Plan (refer to *Financial assurances and stockpiling – who, when, what and how much*.

4.2.2 Community consultation

- Depending on the location, potential off-site risks and level of community interest associated with an activity, an appropriate level of community consultation may need to be undertaken both at the planning and operational stages of stockpiling activities. In such cases, stakeholders including surrounding communities and local residents should be advised on issues such as duration, potential risks and impacts and the related mitigation measures. Relevant contact details of company or project coordinators should also be provided to the community to allow queries or complaints to be addressed.

Appendix 1 Risks associated with stockpiling of materials

The local climatic conditions of a site along with the risks listed are major considerations in determining if it is suitable to stockpile particular types of waste or other matter. The likelihood of harm occurring is also dependent on implementation of appropriate management plans. Inappropriate management of such risks may lead to a breach of the EP Act including causing environmental harm including nuisance.

Risks		Potential impacts	Examples of factors affecting the risks and resulting impacts	Suggested measures
1	Pollution of waters, leaching or runoff of contaminants and particulates	• reduced natural resource quality and potential use • site contamination (land, surface water and ground water) • site degradation • reduced ecosystem quality and function • could be considered disposal and subject to fines under the *Environment Protection (Waste to Resources) Policy 2010*	• material type and leachability • climatic controls • effectiveness of management procedures and practices • engineering controls • topography and proximity to watercourses	• containment of leachate and diversion and control of stormwater • bunding • low permeability surface • cover/enclosure • stormwater runoff controls such as silt traps and settlement ponds • management plans • suitable site selection and separation distances
2	Heat generation with potential to cause fire	• damage to property, risk to human health • pollution of atmosphere • offensive odours	• material type • stockpile dimensions • climatic conditions	• minimise stockpile size • ensure suitable access and spacing • monitor stockpile temperatures • maintain aerobic conditions • implement operational procedures and contingency plans • maintain fire prevention and firefighting equipment

Risks		Potential impacts	Examples of factors affecting the risks and resulting impacts	Suggested measures
3	Generation of litter	• degradation of the environment • threat to fauna • adverse impact on amenity	• material type • management procedures • engineering controls	• housekeeping, litter collection and other operational procedures and management • containment such as fencing, enclosures, cover and other physical barriers
4	Dust emissions	• adverse impact on amenity • damage to property • human health impacts (eg respiratory problems)	• climatic conditions including exposure to winds • elevation • stockpile size • waste type • exposed soils/unsealed roads	• physical controls (sprays, covers, compaction, screening, enclosure, windbreaks, binders and road surfacing) • traffic (control frequency and speed) • minimised stockpile height ie should generally be lower than surrounding structures • suitable site selection and separation distances • materials handling, operational procedures and management, eg moisture content during handling or cessation of activities in adverse conditions
5	Odour emissions	• adverse impacts on amenity	• material type • climatic conditions • management procedures • land use and compatibility with surrounding land use	• physical controls, eg containment, cover, enclosure, vapour filtration • suitable site selection and separations distances • effective management and monitoring procedures • maintain aerobic conditions

Risks		Potential impacts	Examples of factors affecting the risks and resulting impacts	Suggested measures
6	Biogas emissions	• adverse impacts on amenity • increased release of greenhouse gas to the environment	• material type • climatic conditions • management procedures • land use and compatibility with surrounding land use	• physical controls, eg aeration, extraction, filtration, containment, enclosure • effective management and monitoring procedures
7	Vermin	• reduced productivity of land • pressure on native species • disease and other risks to human health	• material type • housekeeping and operational procedures and management	• suitable facility design • physical barriers and enclosure • implement effective management procedures
8	Adverse visual amenity	• interference with the enjoyment of the area and creation of unsightly or offensive conditions	• stockpile size • material type • land use and compatibility with surrounding land use	• minimise stockpile size • suitable site selection and separation • physical controls eg screening, enclosure
9	Stockpile instability	• stockpile collapse, leading to potential injury and damage to infrastructure	• material type • topography • climatic conditions • stockpile height • materials management	• implement appropriate materials handling procedures • minimise stockpile size

Risks		Potential impacts	Examples of factors affecting the risks and resulting impacts	Suggested measures
10	Inadequate platform stability and suitability	• site contamination • infiltration of leachate into and damage to underlying groundwater aquifers • damage to stockpiled area and infrastructure • potential damage to capping material if storage is on old landfill leading to increased risk of emissions from leachate and gas generation • ground instability	• material type • sub-surface geology and structure below sub-base • sub-base material characteristics (particle size, Atterberg limits, density) • likelihood of sub-base failure eg due to faulting, sliding, slumping, caving or climatic impacts • proximity to extraneous sources of ground vibrations including railway lines	• suitability designed and engineering facility • minimise stockpiling size and overloading • suitable size selection and separation distances
11	Excessive accumulation of material	• adverse impact on amenity • increased risk of dust emission, contaminated runoff and other adverse impacts • expanding capacity of site • increased environmental liability and increased risk of abandonment • distortion of market and avoidance of levy by diverting material to stockpile with no sustainable end use	• speculative stockpiling/lack of market • lack of materials balance and flow management • acceptance of inappropriate materials • ineffective or lack of planning and management procedures	• pre-planning • appropriate materials flow calculations, management and procedures • contingency plans • acceptance of appropriate waste (types, volumes) • ensuring existence and availability of markets • store materials awaiting recycling or reuse for no longer than 24 months • appropriate disposal and payment of levy on materials without a genuine reuse/market

Risks		Potential impacts	Examples of factors affecting the risks and resulting impacts	Suggested measures
12	Abandonment of stockpiles and avoidance of regulatory regime	• adverse impact on amenity • distortion of market and avoidance of levy by diverting material to stockpile with no sustainable end use • increase risk of harm of occurring due to lack of management	• speculative or long term stockpiling • lack of market • lack of planning • inappropriate management • unsuitable persons accepting waste	• existence and availability of markets • pre-planning • contingency plans • sustainable materials flow practices • store materials awaiting recycling or reuse for no longer than 24 months • appropriate ownership, contractual and management arrangement financial assurance
13	Mischievous or criminal vandalism	• damage to property • financial losses • harm to the environment eg due to fire or spills • harm to human health eg due to fire, chemical release, accident	• accessibility of the site • visibility of the site • supervision of the site • contingency planning	• secure fencing • security cameras • automated alarms and fire response systems • supervision • response plans

Appendix 2 Stockpile management plan

A licensee may be required to provide a stockpile management plan (SpMP) to the EPA to demonstrate how stockpiles are being managed. SpMPs offer proactive and collaborative approach to understand the risks of stockpiling so the EPA can set reasonable stockpile limits as a condition of authorisation. The SpMP applies to waste or any other matter that is received and stockpiled on the premises.

Licensees are required to set out the following in a SpMP for approval by the EPA:

1 A detailed list of the materials that are received and stockpiled at the premises and their intended fate (refer to Appendix 3).

2 Locations of stockpile areas, number of intended stockpiles for each material and maximum sizes.

3 Identified risks and their proposed management.

4 Milestones (including timeframes and volumes) for expected stockpile growth and reduction in reference to the baseline volume.

5 Management and record keeping procedures (ie for recording the amount and type of material flowing in to and out of the site).

6 The quality assurance and control processes that will ensure the materials stockpiled are suitable for their intended fate.

7 Demonstrate evidence of immediate markets for all stockpiled material (including market conditions and intended customers or material fates).

8 A contingency plan to be activated if market conditions become unfavourable or in the event of an unsuccessful bid for a development project/trial of new product.

This information will inform the setting of a maximum allowable stockpile limit by licence condition if applicable.

The SpMP must demonstrate how stockpile management practices will be implemented to:

- prevent or minimise the risk of harm to the environment and human health
- ensure materials received at the premises will be circulated through appropriately authorised waste management processes to support a strong market for recovered resources
- reduce the potential liability for abandoned stockpiled materials and levy avoidance.

Criteria for an acceptable SpMPs

The licensee is responsible for submitting a plan to the EPA for approval. A SpMP is assessed based on whether it includes the following criteria.

	Criteria
1	Map of site layout that clearly identifies specific stockpile areas for each material type, water access, fire breaks/buffers between stockpiles and vacant space necessary to move smouldering material in the event of fire
2	Details of identified risks to the environment, human health and material circulation and their management procedures (ie procedures for preventing potential fires and groundwater contamination, while criteria 9 below refers to contingency planning for unfavourable market conditions)
3	Details of the specific wastes and other matter received and stockpiled at the premises and their intended fate
4	Details of the waste processing undertaken on site (receipt, segregations, sorting, processing and storage)
5	Details of management procedures for stockpile shape and type (baled, loose, bunded, undercover, enclosed), footprint, stability (batter slope, stacking layout), separation distances (buildings and stockpiles) and numbers of stockpiles
6	Milestones (including timeframes and volumes) for stockpile material flow management, eg maximum growth and planned turnover and/or reduction, and record keeping procedures to monitor material flow
7	Details of the methodologies for QA/QC processes to be implemented for: a wastes to be received for processing b processing procedures c procedures to ensure that no unauthorised wastes or materials are included in final products d sampling and assessment to confirm that the physical and chemical quality of the material meets appropriate criteria for the intended fate of all stockpiled material/waste.
8	Evidence of market analysis (including market conditions, potential fluctuations, and intended customers)
9	A contingency plan should market conditions become unfavourable and details of material/stockpile management in the event of an unsuccessful a development project/trial of new product
10	Purpose and details of proposals for intermediate storage for future development projects/trial of new products a reason for material fate/new product and details of net benefit b material fate volume(s) required and destination(s) for non-sensitive sites only c proposed timeframe for the activity.
11	Details of material flow for the facility, eg material movements in and out of the facility are to be recorded and provided to the EPA. Once mass balance reporting requirements (reporting and system) come into effect, these will supersede reporting requirements for some licensees.

Appendix 3 Definitions

Refer to *Waste Definitions guideline* for further waste and waste-related definitions.

Biosolids	Stabilised organic solids derived totally or in part from wastewater treatment processes that can be managed safely to utilise beneficially their nutrient, soil conditioning, energy, or other value. The term 'biosolids' does not include untreated wastewater sludges, industrial sludges or the product produced from the high temperature incineration of sewage sludge. It should also be noted that many other solid waste materials are not classified as biosolids, eg animal manures, food processing or abattoir wastes, solid inorganic wastes and untreated sewage or untreated wastes from septic systems/sullage wastes.
Chemical substance	Any organic or inorganic substance, whether a solid, liquid or gas (or combination thereof), and includes waste.
Commercial and Industrial Waste (C&I)	**Commercial and Industrial Waste (General)** The solid component of the waste stream arising from commercial, industrial, government, public or domestic premises (not collected as Municipal Solid Waste), but does not contain Listed Waste, Hazardous Waste or Radioactive Waste. **Commercial and Industrial Waste (Listed)** The solid component of the waste stream arising from commercial, industrial, government, public or domestic premises (not collected as Municipal Solid Waste), that contains or consists of Listed Waste.
Compost	Pasteurised material resulting from the controlled microbiological transformation of compostable organic waste under aerobic and thermophilic conditions for at least six weeks.
Construction and Demolition Waste (C&D)	**Construction and Demolition Waste (Inert)** The solid inert component of the waste stream arising from the construction, demolition or refurbishment of buildings or infrastructure but does not contain Municipal Solid Waste, Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste or Radioactive Waste. *Notes:* *C&D waste (Inert) should be such that the entire composition of the C&D materials is Inert Waste with no contamination by foreign material. As such it is acknowledged that – with the aim of no contamination – there may be some negligible components of foreign material contained in the waste (as a guide, 0−5% maximum by volume per load). C&D waste (Inert) includes bricks, concrete, tiles and ceramics, steel and inert soils.* *Foreign material includes green waste, plastics, electrical wiring, timber, paper, insulation, tins, packaging and other waste associated with construction or demolition of a building or other infrastructure. Foreign material must not be Municipal Solid Waste, Liquid, Listed, Hazardous or Radioactive Waste.* **Construction and Demolition Waste (Mixed)** The solid component of waste stream arising from the construction, demolition or refurbishment of buildings or infrastructure which contains some foreign material (as set out below), but does not contain Municipal Solid Waste, Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste or Radioactive Waste. *Notes:* *C&D Waste is considered C&D Waste (Mixed) if it contains significant foreign materials from construction and demolition activities that would render the load of waste no longer inert (as a guide, 5−25% maximum by volume per load).* *Foreign material includes green waste, plastics, electrical wiring, timber, paper, insulation, tins,*

packaging and other waste associated with construction or demolition of a building or other infrastructure. Foreign material must not be Municipal Solid Waste, Liquid, Listed, Hazardous or Radioactive Waste.
Where waste from construction and demolition sites contains predominantly foreign materials or domestic waste, such as waste from household clean-ups collected by commercial skip bins, this is defined as Commercial and Industrial Waste (General).

Contaminant For the purpose of the EPA Act, contaminant means a chemical substance that has no beneficial effects for the stated purpose and has the potential to cause harm to the environment, human health or agriculture.

Environmental liabilities Environmental liabilities have been described in non-legal terms as an obligation based on the principle that a polluting party should pay for damage caused to the environment by its activities. For the purposes of this guideline, the costs of rehabilitating environmental harm, stockpiling (authorised and unauthorised) and abandonment of waste or other matter are environmental liabilities.

E-waste Waste electrical and electronic equipment that is dependent on electric currents or electromagnetic fields in order to function (including all components, subassemblies and consumables which are part of the original equipment at the time of discarding). For example e-waste may include:

a Consumer/entertainment electronics (eg televisions, DVD players and tuners).

b Devices of office, information and communications technology (eg computers, telephones and mobile phones).

c Household appliances (eg fridges, washing machines and microwaves).

d Lighting devices (eg desk lamps).

e Power tools (eg power drills) with the exclusion of stationary industrial devices.

f Devices used for sport and leisure including toys (eg fitness machines and remote control cars).

Financial assurance For the purposes of the EP Act (section 51), financial assurances are a type of financial security that can be include security bonds, bank guarantees or insurance. They can be required by governments to cover the cost of environmental rehabilitation, should a person or business fail to meet their environmental obligations. The EPA can only require a financial assurance as a condition of authorisation under the EP Act.

Hazardous waste Listed waste having a characteristic described in Schedule A List 2 of the *National Environment Protection (Movement of controlled waste between States and Territories) Measure*.
Note: Hazardous Waste includes any unwanted or discarded material (excluding radioactive material), which because of its physical, chemical or infectious characteristics can cause significant hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed.

Inert waste Solid waste that has no active chemical or biological properties. These wastes do not undergo environmentally significant physical, chemical or biological transformation and have negligible potential to cause environmental harm.

Leachate A liquid that has percolated through and/or been generated by decomposition of waste material. It includes water that comes into contact with waste and is potentially contaminated by nutrients, metals, salts and other soluble or suspended components and products of decomposition of the waste.

Material fate

Material fate includes those:

- approved by the EPA for on-site operational use, disposal or cover
- exiting the site as a recovered resource (eg approved recovered resource that meets an Australian Standard, or EPA approved standard, such as the waste derived fill standard) or product that is ready and intended for imminent use, without the need for further treatment to prevent any environmental harm
- transferred to another facility authorised to receive the waste
- approved by EPA for intermediate storage for future genuine customer (eg development projects, trial of new products) and an associated approved Stockpile Management Plan
- approved by EPA to produce a by-product and its storage (with limits and timeframes) or disposal.

Material flow

In accordance with the EP Act, the EPA promotes the circulation of materials through the waste management process, to support a strong market for recovered resources. At licensed sites, the stockpiling of materials must not be a process of continual growth, even with varying markets that the activity is supplying or targeting. Instead for responsible operators, material flow balances material input with the fate of the material (material fate) across reasonable timeframes.

Maximum allowable stockpile limit

The EPA may impose or vary a *maximum allowable stockpile limit* as a condition of authorisation, to promote the circulation of materials through the waste management process [section 45(3)(b)(iia) of the EP Act].

Municipal Solid Waste

Municipal Solid Waste − Hard Waste
The solid component of the waste stream arising from domestic premises which is not suitable for collection using a kerbside bin system, but does not contain Commercial and Industrial Waste (General), Listed Waste, Hazardous Waste, Radioactive Waste or waste that is not deemed suitable for collection by local councils.
Note: MSW (Hard Waste) is typically collected in campaigns by local councils, which also advise on what wastes are suitable for that collection.

Municipal Solid Waste − Kerbside bin collection
The solid component of the waste stream arising from mainly domestic but also commercial, industrial, government and public premises including waste from council operations, services and facilities that is collected by or on behalf of the council via kerbside collection, but does not contain Commercial and Industrial (General) Waste, Listed Waste, Hazardous Waste or Radioactive Waste.

Pollutant

means−

a any solid, liquid or gas (or combination thereof) including waste, smoke, dust, fumes and odour; or

b noise; or

c heat; or

d anything declared by regulation (after consultation under Section 5A) or by an environment protection policy to be a pollutant,

but does not include anything declared by regulation or by an environment protection policy not to be a pollutant.

Pollute

means−

a discharge, emit, deposit or disturb pollutants; or

b cause or fail to prevent the discharge, emission, depositing, disturbance or escape of pollutants,

and **pollution** has a corresponding meaning.

Site contamination

1 For the purposes of this Act [EP Act], ***site contamination*** exists at a site if—

a chemical substances are present on or below the surface of the site in concentrations above the background concentrations (if any); and

b the chemical substances have, at least in part, come to be present there as a result of an activity at the site or elsewhere; and

c the presence of the chemical substances in those concentrations has resulted in—

i actual or potential harm to the health or safety of human beings that is not trivial, taking into account current or proposed land uses; or

ii actual or potential harm to water that is not trivial; or

iii other actual or potential environmental harm that is not trivial, taking into account current or proposed land uses.

2 For the purposes of this Act, environmental harm is caused by the presence of chemical substances—

a whether the harm is a direct or indirect result of the presence of the chemical substances; and

b whether the harm results from the presence of the chemical substances alone or the combined effects of the presence of the chemical substances and other factors.

3 For the purposes of this Act, site contamination does not exist at a site if circumstances of a kind prescribed by regulation apply to the site.

Stockpile management plan

A stockpile management plan (SpMP) can be required as a condition of authorisation to demonstrate how stockpiles are being managed, with the aim of preventing unauthorised stockpiling of materials and preventing or minimising environmental harm. The SpMP will inform setting reasonable stockpile limits as a condition of authorisation.

Unauthorised stockpiling

For the purposes of the EP Act, unauthorised stockpiling of waste, or other matter, occurs if a *maximum allowable stockpile limit* (stockpile limit) imposed under this Act has been exceeded [section 3(5)].

Virgin material

Virgin material is material excavated onsite such as at a quarry or sand mine specifically for the purpose of being used as fill. Virgin excavated materials can be clay, gravel, sand, soil or rock fines that have been 'excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities – that does not contain any sulfidic ores or soils or any other waste[8]'.

Waste

As defined under section 4 of the *Environment Protection Act 1993*

[8] *NSW Protection of the Environmental Operations Act 1997*

Appendix 4 Further guidelines and information

EPA Publications

Bunding and spill management, publication, https://www.epa.sa.gov.au/files/47717_guide_bunding.pdf

Code of practice for milking shed effluent, https://www.epa.sa.gov.au/files/4771456_milking_shed.pdf

Copper chromated arsenate (CCA) timber waste – storage and management, https://www.epa.sa.gov.au/files/7565_guide_cca.pdf

Collection depots, https://www.epa.sa.gov.au/files/12733_cdlguide02.pdf

Compliance and enforcement – Regulatory options and tools, https://www.epa.sa.gov.au/files/4771765_cem.pdf

Compost Guideline, https://www.epa.sa.gov.au/files/7687_guide_compost.pdf

Guidelines for environmental management of on-site remediation, https://www.epa.sa.gov.au/files/4771274_guide_remediation.pdf>

Evaluation distances for effective air quality and noise management, https://www.epa.sa.gov.au/files/14157_eval_distances_2019.pdf

Financial assurances and stockpiling – who, when, what and how much, https://www.epa.sa.gov.au/files/14657_info_finance_assurance.pdf

Guidelines on resource recovery processing requirements, https://www.epa.sa.gov.au/files/4771379_resource_recovery.pdf

Guidelines for the safe handling and reuse of biosolids in South Australia, https://www.epa.sa.gov.au/files/14641_guide_biosolids.pdf

Guidelines for the Establishment and Operation of Cattle Feedlots in South Australia, https://www.epa.sa.gov.au/files/477369_cattle.pdf

Liquid waste classification test, https://www.epa.sa.gov.au/files/8425_guide_liquidwaste.pdf

Soil bioremediation, https://www.epa.sa.gov.au/files/8372_guide_soil.pdf

Standard for the production and use of waste derived fill, https://www.epa.sa.gov.au/files/4771359_standard_wdf.pdf

Standard for the production and use of waste derived soil enhancer, https://www.epa.sa.gov.au/files/4771360_standard_wdse.pdf

Undercover storage requirements for waste/recycling depots, https://www.epa.sa.gov.au/files/4771348_info_storage_waste.pdf

Waste definitions, https://www.epa.sa.gov.au/files/4771336_guide_waste_definitions.pdf

Waste Levy Regulations, https://www.epa.sa.gov.au/files/4771666_guide_levy.pdf

Waste tyres, https://www.epa.sa.gov.au/files/4771416_guide_tyres.pdf

Waste & recycling

For information on disposing of waste, requirements for waste depots, and disposing of waste (solid waste, liquid waste and hazardous waste), https://www.epa.sa.gov.au/environmental_info/waste_management

Reforming waste management

For information on the amendments to the EP Act including Schedule 1, introduction of mass balance reporting, implementing stockpiling controls and better management of waste or other matter, http://www.epa.sa.gov.au/environmental_info/waste_recycling/waste-reform

For information on what can be done with specific waste types, including specific collection programs that are offered to deal with waste, https://www.epa.sa.gov.au/environmental_info/waste_recycling

Other useful references

Department of Agriculture (Biosecurity), www.agriculture.gov.au/biosecurity

Dairy Australia information on effluent, www.dairyaustralia.com.au/farm/land-water-carbon/soils-fertiliser-and-effluent

General Guidelines for the Outdoor Storage of Used Tyres (2014), South Australian Fire Services, Guideline 013, Amendment A, <www.mfs.sa.gov.au/public/download.jsp?id=71013f>.

Management and storage of combustible recyclable and waste materials – guideline, Victorian Environment Protection Authority, Publication 1667.2, https://www.epa.vic.gov.au/-/media/epa/files/publications/1667-2.pdf

National Environmental Guidelines for Piggeries (indoor and outdoor), australianpork.com.au/industry-focus/environment/national-environmental-guidelines-for-piggeries/

National Environmental Management System for the Meat Chicken Industry – Version 2 (2014), www.agrifutures.com.au/wp-content/uploads/publications/14-100.pdf

SafeWork SA, https://www.safework.sa.gov.au/industry

Tyre Stewardship Australia *Best Practice Guidelines on Tyre Storage and Fire and Emergency Preparedness* (2019), www.tyrestewardship.org.au/tsa-knowledge/tyre-storage-guidelines

Australian Standards

Sampling and testing aggregates – AS 1141 series

Sampling and testing of soils for engineering – AS 1289 series

Sampling and testing Asphalt – AS 2891 series

Aggregate and Rock for engineering – AS 2758 series

Leachate Methods of Analysis – AS 4439 series

Maintenance of fire protection systems and equipment – AS 1851−2005

Fire safety audits – AS 4655−2005

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EPA Radiation

Telephone: (08) 8463 7826
Facsimile: (08) 8124 4670
Freecall (country): 1800 623 445
Website: https://www.epa.sa.gov.au/environmental_info/radiation
Email: EPARadiationProtectionBranch@sa.gov.au

Legislation

Legislation, regulations and environmental policies may be viewed on the internet at: www.legislation.sa.gov.au

Biosecurity

Department of Primary Industries and Regions SA, https://www.pir.sa.gov.au/

Planning and development

Department for Infrastructure and Transport, https://www.dpti.sa.gov.au/

Plan SA, https://plan.sa.gov.au