

# WASTE MANAGEMENT STRATEGY FOR THE NORTHERN TERRITORY 2015–2022

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# 1. PURPOSE

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This Strategy provides a basis for understanding and improving the management of waste across the Northern Territory (the Territory) to reduce the generation of waste, increase rates of resource recovery and to minimise environmental impacts caused by waste. It provides an overarching summary of the waste management issues currently being faced in the Territory. Opportunities to improve waste practices are discussed as management actions that will be undertaken by the Northern Territory Environment Protection Authority (NT EPA) with the support and involvement of various industry, government agency, local government and community interests.

Advice from the waste management industry and a Waste Management Advisory Committee set up under Section 11 of the *Waste Management and Pollution Control Act* (WMPC Act) has been of great assistance in developing this Strategy.

Formal support of the Northern Territory Government will be sought by providing this Strategy to the Minister for Lands Planning and Environment (the Minister) as part of the advice provided under Part 3 of the *Northern Territory Environment Protection Authority Act* (NT EPA Act).

## 2. MANAGEMENT ISSUES

**W**aste is a significant environmental issue. Disposal of waste consumes land, produces pollution to the atmosphere, soil and groundwater, and represents a loss of potential resources including embodied energy and materials. It is difficult to measure the extent of the impact of waste in the Territory when valuable information on waste types, trends and end-points are limited, held by multiple entities (eg NT EPA, NT Government, and local government) and rarely consolidated.

Impacts on the environment and human health from poor waste management include the adverse effects of odour, noise and dust associated with waste management facilities. More serious health concerns can escalate through contamination of land, groundwater and adjoining surface waters, or explosion hazards from landfill gas.

Poor environmental outcomes will occur in the absence of appropriate management practices and regulatory monitoring of waste streams (Appendix A). Poor outcomes can include littering and illegal waste dumping through to large scale waste facilities operating without appropriate environmental controls and monitoring programs. The various environmental provisions for regulating waste in the Territory are insufficient to overcome barriers to achieving high quality waste management practices.



**Batteries contain toxic heavy materials**

There are particular constraints to improving waste management across the Territory, and the challenges vary in nature and scale across regions. The more highly populated towns and cities generate greater volumes of domestic and construction waste resulting in a heavier load on existing waste facilities. Significant mining, oil, gas and other commercial industrial projects are well underway, generating an expanding number of waste streams, such as mercury as a contaminant of LNG processing. Regional towns with smaller populations face economic constraints to implementing standard recycling and resource recovery practices. The cost of establishing recycling businesses, combined with difficulties in establishing demand for recycled

materials, leaves little incentive to attract investment in resource recovery outside of major city centres. This results in some wastes that could otherwise be recycled, ending up in landfill. On top of this, listed wastes<sup>1</sup> such as asbestos, clinical waste and liquid wastes can cause significant problems when buried in remote landfills without adequate environmental controls.

Remote communities of the Territory are poorly serviced and some are isolated from the rest of the Territory for months during the wet season (December to May). Waste management can be a difficult task in remote communities, where education is required to stimulate ownership of waste, and to elevate its status as an essential service to protect community health. There is generally very limited waste infrastructure or access to markets for recyclables, and the recruitment and ongoing retention of staff is a challenge. The vast distances and poor road conditions between towns restricts opportunity to separate and transport recyclable and hazardous wastes to appropriate facilities. Landfills are generally designed below minimum standards for environmental protection yet may be the only disposal option provided. Very few, if any, regional councils can afford the cost of relocating or redesigning existing landfills to a level that can achieve assured environmental protection or costs of providing waste management services. The selection of suitable land to develop for landfill can be impeded by the need for landowner consent, and the complexities with identifying appropriate custodians of the land.



**Hazardous or recyclable wastes often end up as landfill**

Across the Territory the total number of accessible, practical and specialised waste processing or recycling facilities is limited in comparison to other Australian states. As a result many wastes need to be transported interstate for recycling, treatment or disposal, and operators face high transportation costs combined with lost economic opportunity to process wastes locally.

<sup>1</sup> Listed wastes are defined under Schedule 2 of the *Waste Management and Pollution Control (Administration) Regulations*.

Forward planning is essential to achieve effective waste management into the future. Improved waste data are required to enable an assessment of the infrastructure needs across the Territory, and to ensure accountability for waste from production through to reuse, recycling or disposal. Planned infrastructure must be environmentally engineered to cater for predicted population growth and industrial waste requirements. Additional capacity to accommodate waste that would result from natural or environmental disasters is needed. Specific infrastructure is required in the Territory to accommodate waste streams requiring specialised treatment prior to disposal, such as clinical waste, oil and other liquid waste. Providing local facilities can stimulate economic opportunity and reduce the additional environmental risks introduced by transporting waste over distances by road and rail.

The broader community and industry need guidance on acceptable waste practices and access to opportunities to reduce the amount of waste going to landfills while increasing the reuse of wastes in sustainable ways.



**Stockpiled waste tyres increase the fire hazard**



**Economic incentives are available through resource recovery**

# 3. OBJECTIVES

The objectives of the NT EPA in preparing this Strategy are to state the issues impacting on waste management in the Territory, and to identify the opportunities to improve waste management in relation to the issues described.

This Strategy identifies the management actions that the NT EPA will undertake to:

- engage with community, industry, local and regional councils, and government agencies to improve waste management outcomes in the Territory;
- implement specific projects to improve rates of resource recovery, manage high-risk landfills and to plan for future and emergency waste;

- improve waste data collection to allow for effective monitoring and analysis to enable the identification and prioritisation of waste improvement actions and challenges;
- improve the regulatory framework in relation to waste management;
- undertake periodic reviews of the effectiveness of this Strategy and update waste management actions as required; and
- provide government and the community with reporting on the progress of the Strategy.



Container deposit receptacles are spreading around the Territory

# 4. MANAGEMENT ACTIONS

The proposed management actions have been developed with consideration of the principles of the waste management hierarchy (Appendix A) which is the preferred order for managing waste and resources. The waste management hierarchy ranks waste avoidance and reduction as the optimal approach, followed by reuse through recycling and recovery options, with disposal as the least preferred approach.

The NT EPA will develop a series of implementation plans identifying timeframes for key management actions. Where appropriate this will be undertaken in consultation with the broader community, industry, government agencies and local and regional councils.

## 4.1 ENGAGEMENT AND EDUCATION

The NT EPA will undertake the following actions to engage and educate on reducing waste generation and minimising the impacts of waste disposal:

1. promote community awareness and understanding of resource efficiency, waste avoidance and resource recovery;
2. fund community grants programs that encourage the reduction and/or reuse of waste in homes, schools, community groups and workplaces;
3. facilitate and promote product stewardship programs for recycling and treating nationally significant waste streams, including tyres, batteries, e-waste, paint and oil;
4. provide best-practice guidance materials for handling and disposing of commercially generated wastes including asbestos, contaminated soils, concrete and wastewater;
5. collaborate with the Waste and Recycling Industry of the NT (WRINT) to identify emerging trends and issues requiring multi-faceted solutions;
6. facilitate coordination of localised waste arrangements in regional development projects;
7. work with local government and the NT Government to coordinate local efforts to prevent litter and illegal dumping;

8. work directly with local and regional Councils and local service authorities to monitor, detect and reduce community exposure to the risks of poor waste management; and
9. work with industry and government agencies to explore the costs associated with transporting hazardous waste out of remote communities, and opportunities available to reduce these costs.



**Leaking chemical drums cause environmental pollution**

## 4.2 IMPROVE WASTE MANAGEMENT

### 4.2.1 Waste reduction and resource recovery

To promote waste reduction and resource recovery in the Territory the NT EPA will:

10. develop and guide waste avoidance and reduction programs;
11. drive the rollout of the Container Deposit Scheme (CDS) in remote communities;
12. continue to provide regulatory oversight to the Plastic Bag Ban;
13. support proposals by regional councils to consolidate recycling infrastructure at central locations;
14. facilitate opportunities to connect waste recovery and reuse markets with key waste producers (e.g. organics, green waste construction and demolition waste and commercial and industrial waste); and

15. work with industry and government agencies to demonstrate the economic incentives available through improved waste management and resource recovery, including options for reducing greenhouse gas emissions from landfill.



**Compacted recyclable containers reduce transport costs**



**Opportunities exist to reuse waste in sustainable ways**

#### **4.2.2 Landfill waste management**

The NT EPA will undertake the following actions to bring Territory landfills towards best practice waste management:

16. assess the status of landfill sites in the Territory to:
  - prioritise high environmental risk sites requiring operational improvement, impact monitoring or rehabilitation, including in a remote context;
  - regulate landfills in accordance with the objectives of the WMPC Act;
17. develop guidance to demonstrate best practice expectations:
  - identify and develop guidelines to assist landfill operators in better managing their waste and resources;
  - develop landfill closure guidelines and procedures to ensure ongoing management, aftercare and rehabilitation of closed sites;
18. develop a waste infrastructure mapping database to identify locations of accessible facilities and to assist strategic planning for the future requirements of the Territory; and
19. collaborate with local waste operators and industry bodies to identify and address the limitations to their delivery of waste management services.

#### **4.2.3 Planning for future waste**

Planning for future waste management is a key action to address increasing general waste disposal requirements, and options for managing new waste types arising from the mining, oil, gas and other industries. The NT EPA will liaise with government agencies to ensure future waste management requirements are considered at the development planning stage, and will:

20. recommend waste reduction and waste management plans are developed and implemented on significant developments;
21. advise on specific infrastructure required to deal with liquid wastes generated locally;
22. highlight the need for early consideration of asbestos disposal locations across the NT, including in remote housing and infrastructure projects;
23. assist local and regional councils and industry to identify key infrastructure needs and to identify appropriate land for future waste management sites; and
24. recommend that industry and government agencies seek innovative technologies as preferred waste solutions, to stimulate waste research and investment (e.g. organics recovery to reduce greenhouse gas emissions).

#### **4.2.4 Emergency waste preparedness**

Planning for the waste that may result from natural or environmental disasters is a priority for the NT EPA. The NT EPA will develop a best-practice NT Emergency Waste Management Plan, in consultation with the NT Government Emergency Management Council and other stakeholders addressing:

25. identified high risk activities that will be required to maintain emergency waste management plans;
26. recommended measures for reducing waste when responding to environmental emergencies;

- 27. new waste streams from emerging industries that may be of high risk and require emergency plans;
- 28. stocktake available waste resources, including land available for the safe temporary storage or treatment of waste;
- 29. commercial arrangements to be put in place allowing industry to be called on in an emergency; and
- 30. waste tracking requirements at the onset of emergency disasters, from waste generation until disposal.



**Landfill fires impact local air quality through odour and smoke**

#### 4.3 IMPROVE WASTE DATA COLLECTION, MONITORING AND ANALYSIS

Waste data are vital to allow for the development of future waste minimisation and reduction targets, assessment of business viability, and ensure the Territory continues to be represented in national waste reviews. The NT EPA will carry out the following actions with regard to the availability and need for waste data:

- 31. identify waste facilities that are not reporting waste data and develop an approach for capturing essential data from these sites;
- 32. develop an improved system for recording and interpreting waste data required to be collected by the NT EPA;
- 33. continue to participate and assist in the development of nationally consistent waste classification systems;
- 34. prioritise targeted waste streams for an audit and compliance program, to ensure a complete tracking pathway from source to destination;
- 35. assist industry to identify business opportunities where demand for waste treatment facilities is not being met;
- 36. ensure relevant Government and Council agencies have access to waste data as required to inform strategic planning; and

- 37. undertake an analysis of NT waste streams based on available data.

#### 4.4 IMPROVE THE REGULATORY FRAMEWORK

The *Waste Management and Pollution Control Act* (WMPC Act) requires that commercial waste operators are regulated and does not provide a clear process for determining licence requirements or exemptions based on environmental risk. This allows some high-risk activities to occur unregulated, and can impose financial and reporting burdens on regulated operators who reuse waste materials for beneficial purposes. Unregulated waste handlers are not required to collect and report on waste handling data, leaving gaps in the understanding of waste trends and waste end-points. In order to address these complexities the NT EPA:

- 38. is conducting a review of the WMPC Act and the *Litter Act*. This will provide the public, industry, government and local government with a discussion paper examining the deficiencies and strengths of the Acts in providing soundly managed waste issues;
- 39. will assess the waste-related components of other legislation administered by the NT EPA to determine their relevance and effectiveness as tools to improve waste management practices in the Territory.

It is important that regulatory reviews lead to improved waste management outcomes. Regulation should reduce impacts of waste on the environment, reduce the regulatory burden where a beneficial reuse of waste is proven, and improve the quality of data gathering capabilities at waste handling sites.

#### 4.5 REPORTING AND PUBLIC REVIEWS

To maintain transparency and ongoing improvements in waste management outcomes in the Northern Territory, the NT EPA will:

- 40. Provide an update on progress in implementing each of this Strategy's management actions in its annual report; and
- 41. Review the Strategy, and as appropriate, renew its content, within five years.



**Waste regulation can reduce impacts on the environment**

# 5. BACKGROUND

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The information used in this background section comes from a large number of sources listed in “Further Reading” at the end of the section. Appendix A expands on the principles guiding waste management in the Territory. Appendix B contains further information on the legislation guiding waste management in the Territory. Specific terms are defined in the Glossary at the end of the document.

## 5.1 TERRITORY POPULATION AND DENSITY

The Territory is growing rapidly, with a projected growth rate of 1.4% per annum over the next ten years (Australian Bureau of Statistics - ABS). This reflects the impact of major projects on the Territory’s interstate and overseas migration. Net migration has increased in recent years, reflecting increased labour demand as a result of the resources boom and skills shortages, particularly for trades and technical workers and specialists in the energy and mining sectors. The ABS (2014) projects the Territory’s population to grow from just over 235,000 in 2012 to just over 285,000 by 2025.

Despite its predicted population growth, the Territory has the lowest population density of any state or territory. At June 2012, the population density of the Territory was 0.2 people per square kilometre.

Three quarters of the Northern Territory’s population reside in its five regional centres, which also serve as vital supply and service bases for dozens of smaller remote communities, with an expanse of distance between all. Throughout the Territory Indigenous people, many still living traditional lifestyles in remote homelands, represent a quarter of the population.

### 5.1.1 Major regional centres

The five major regional centres of the Territory are:

- Top End region including; Darwin, Palmerston, Litchfield and surrounds;
- Central region with Alice Springs as the regional centre;
- Katherine region;
- Barkly region serviced by the township of Tennant Creek; and
- East Arnhem region with the main service centre being the mining town of Nhulunbuy.

The largest number of Territorians live in the Top End region. The Central region is the second most populated area. The remainder live in Katherine, Tennant Creek, Nhulunbuy or in the hundreds of other outstations and smaller remote communities throughout the Northern Territory (Northern Territory Government – Framing the Future).

Residents in major regional centres usually have greater access to hazardous waste facilities and specialised operators to collect, transport, store, treat and recycle waste than in more remote communities/outstations. Accessible waste collection points reduce the risks of hazardous wastes entering landfills. Kerbside waste collections with a recycling collection service can increase the separation of paper, plastics and glass recyclables, and reduce the loss of recoverable resources to landfill. A kerbside rubbish collection service is provided to residents of Darwin and Palmerston, Alice Springs, Katherine, Tennant Creek and Nhulunbuy.

Due to its higher relative population, the Greater Darwin region is considered to be the major contributor of waste. In 2013 the City of Darwin (Council) reported that 170,000 tonnes of waste material was landfilled at the Shoal Bay Waste Management Facility alone. Recycling and resource recovery rates are estimated at less than five percent in the Territory, compared to the national average of 60 percent (Australian Government Department of the Environment). Recyclables are largely transported interstate or internationally for processing, as there are few regional centres for processing recyclables in the Territory.

### 5.1.2 Smaller remote communities

Remote regions with low population density face particular barriers to implementing and/or expanding resource recovery initiatives. Kerbside rubbish collections are restricted, as are accessible facilities for dealing with hazardous or recyclable wastes. Landfill burial and burning of waste is a common practice where there are limited alternatives. Industry investment in waste management facilities may not be viable in smaller communities where smaller quantities of recyclable materials are generated. High transportation costs, vast distances and limited accessibility to interstate and intrastate markets restrict regions’ potential to create business opportunities around waste management. When economic incentives of resource recovery are not demonstrated to the community, there is little incentive to engage in more sustainable practices.

The challenge for waste management in small communities is to adopt an integrated approach, including avoidance, recycling, reuse, treatment and disposal. Under an integrated management approach, councils and communities should determine what options will best fit their community. This may mean that a landfill is not actually needed, and a transfer facility may be preferable. Transfer of some or all waste to a landfill serving other communities may be a more economically viable option than developing a new landfill. Transferring waste also minimises environmental impact by reducing the number of waste disposal sites across a region. Under such a system, waste is either transported directly to the landfill serving the area's communities or deposited in a transfer station before being taken to the landfill.

An organised waste management framework in smaller communities is essential to identify the local infrastructure requirements, and to identify the waste streams with specific disposal requirements. Across the Territory, there are specific waste streams being generated that require specialised treatment prior to careful disposal (e.g. asbestos and liquid waste).

## 5.2 PROBLEM WASTES

Wastes may be difficult to dispose of due to their hazardous properties or lack of options for disposal, and are often referred to as problem wastes. These may vary in different parts of the Territory, depending on the location, volumes and access to infrastructure for storage and disposal.

The key problem wastes common across the Territory include liquid wastes, asbestos, medical waste, batteries, paints and solvents. Many of these are listed wastes in the Territory, and landfills are not permitted to accept listed wastes without an Environment Protection Licence under the *Waste Management and Pollution Control Act*.

### 5.2.1 Liquid waste

Liquid wastes generated in the Territory predominantly refer to waste oil, sewage and contaminated vehicle wash waters. As telecommunications are upgraded and expanded across the Territory, there has been an increase in the volume of asbestos-contaminated slurry being removed from old telecommunication pits.

All major regions in the Territory have waste stabilisation ponds to treat wastewater and effluent, which is then allowed to evaporate or is discharged under certain conditions. Power and Water undertakes selected wastewater treatment, with recycled water used on a limited basis in Darwin, Pine Creek, Katherine and Alice Springs. Trade waste liquid generated from industry, business, trade, and manufacturing process or similar may require pre-treatment prior to discharge to sewer, under a Trade Waste Management System.

Domestic quantities of oil can be disposed of at licensed facilities in all major regional centres. Large quantities of oil are considered hazardous, and are commonly exported interstate for treatment and disposal. Slurry mixtures from pits containing asbestos are generally not accepted for landfilling, and must be allowed to dry out prior to appropriate disposal.

### 5.2.2 Asbestos

The amount of asbestos in homes, commercial buildings, shipyards, power stations, boiler makers and plumbing is not known. It has been estimated that about one third of homes built in the Territory between 1945 and 1980 used asbestos containing materials (ACM) in walls, ceilings, eaves, kitchens, bathrooms, vinyl floor tiles and in sheds and garages.

In the Territory there are limited options for asbestos disposal and storage. Regional landfill sites that are licensed to accept asbestos will often not accept asbestos collected from beyond their municipal boundaries, despite being permitted to do so.

Unknown quantities of asbestos wastes may be accumulating in unlined landfill pits or dumped in undocumented locations, posing a risk to people, the environment and future generations.

The identification of dedicated asbestos disposal sites with the capacity to accept ACM from Territory communities has become an imperative.

### 5.2.3 Medical: clinical and related waste

In the Territory the health care sector generates clinical and related waste from a variety of government and non-government health care facilities. Some categories of waste produced through health care (such as cytotoxic, or laboratory waste) are hazardous to health and the environment and require special treatment and disposal.

Darwin's clinical waste is predominantly processed (i.e. rendered non-infectious and unrecognisable) by an autoclave at the Royal Darwin Hospital (RDH) Waste Management Facility. The Shoal Bay Waste Management Facility accepts clinical waste that is processed by the RDH Waste Management Facility's autoclave. Materials that require incineration are transported to South Australia.

The Territory's health care sector generated in excess of 390 tonnes of clinical waste in 2010-11. Of that, almost 260 tonnes of clinical waste was processed by the RDH Waste Management Facility and over 130 tonnes was transported to South Australia for incineration.

### 5.2.4 Batteries

Batteries are a common form of household hazardous waste, containing metals toxic to human health and the environment.

Primary (single-use) batteries are usually alkaline batteries with Zinc, Manganese or Lithium chemistry. They are typically found in toys, watches, clocks, smoke alarms, audio-visual equipment and remote controls. Secondary (rechargeable) batteries commonly contain Nickel Cadmium, Nickel Metal Hydride or Lithium Ion. They are most commonly found in cordless drills, mobile phones, laptops and PCs, shavers and cameras. Lead-acid batteries are the oldest type of secondary battery, and are typically used to power vehicles.

Batteries can be harmful to the environment when disposed of to landfill, as the chemicals inside can leach from their casings and pollute land and water with toxic heavy metals. When returned to appropriate collection points, they can be processed to recover plastics and metals, some of which are used to manufacture new batteries. Used lead-acid batteries can be successfully re-conditioned.

Batteries are not specifically regulated in the NT as a listed waste. The components of batteries, including acids, lead and mercury, are regulated as listed waste. There are 12 licensed facilities across Greater Darwin, Katherine and Alice Springs that may accept battery components, which are then sent to licensed recycling facilities elsewhere in Australia or overseas for processing.

### 5.2.5 Paints and solvents

Domestic quantities of paint and solvents are collected at seven licensed waste facilities across the Territory, and are commonly exported to South Australia for treatment and disposal. If deposited directly into landfill, paint poses a potential risk to the environment, especially in cases where the landfills are not adequately constructed and managed to protect groundwater and surface water.

The Australian Government has listed waste paint as a Priority Product for the development of a stewardship program under the *Product Stewardship Act 2011* (Appendix B). A government and industry implementation working group has been formed and is working to develop a national voluntary, industry-led product stewardship scheme.

The scheme is proposed to be launched in 2015, and will be open to both the public and trade painters, providing free, safe drop-off points across Australia.

### 5.3 INDUSTRY OPPORTUNITY

Considering the types of problem wastes that currently require interstate transport for treatment and disposal, there are opportunities for the waste industry to expand in the Territory. Particular expertise is required to treat or dispose of problem wastes locally and to increase rates of resource recovery. The Territory does not apply landfill levies for waste disposal. In other jurisdictions levies have been used to drive investment in alternative recycling and resource recovery infrastructure.

The Australian Government is exploring the potential for the expansion of development of Northern Australia. It will explore ways to capitalise on the region's strengths, provide the best regulatory and economic environment for business, and identify critical infrastructure for long-term growth, public and private planning, and investment.

As the Territory matures into a major international gas hub and key trade gateway to Asia, increased waste volumes and further new waste streams are likely to be generated into the future and will require suitably designed facilities with experienced operators. The emerging wastes include those generated through exploration, drilling and mining.

Further development in the North must be accompanied by a growing capacity within the waste industry to predict and provide the necessary waste management infrastructure, services and enterprise. The NT EPA will continue to regulate the activities of waste facilities and operators where required by the WMPC Act. Specific conditions are designed and applied in order to minimise the environmental impacts of waste handling activities.

Regulation of resource recovery facilities will continue under the *Environment Protection (Beverage Containers and Plastic Bags) Act (EP(BC&PB)Act)* (Appendix B) in order to increase resource recovery and reduce littering of beverage containers.

## 5.4 ENVIRONMENTAL IMPACTS OF WASTE

The potential impacts of waste handling and disposal activities range from environmental nuisance caused by noise, odour and dust, to more serious environmental issues such as land and water contamination. In extreme cases, human health is risked by the potential hazards of explosion or asphyxiation from landfill gas.

### 5.4.1 Landfill

When waste is buried in landfill, the physical, chemical and biological breakdown of refuse produces leachate (liquid effluent that moves through or drains from a landfill). Uncontrolled rainwater intrusion to landfill can lead to excessive generation of leachate. Where no liner is in place, leachate can discharge through the base of a landfill and contaminate groundwater, leading on to contamination of surface water.

Poorly contained leachate can contaminate surface water via discharges from the landfill surface and stormwater management systems. Water falling on or running across a landfill has the potential to cause an overload of sediment into receiving waters, pollute the environment and spread disease as it can pick up harmful bacteria and chemicals by coming into contact with wastes. Surface water controls will prevent surface water from mixing with waste and prevent sediment or contaminants from being carried off the landfill site. Effective

mechanisms can be developed for the early detection of surface water pollution.

The physical, chemical and biological breakdown of refuse also produces landfill gas (LFG). LFG consists primarily of Methane ( $\text{CH}_4$ ) and Carbon Dioxide ( $\text{CO}_2$ ) and is generated in all landfills that contain organic (decomposable) materials, increasing the emissions of greenhouse gases into the atmosphere. LFG has potential for use as a fuel, but when released into the atmosphere or the groundwater LFG may present toxic hazards, both acute and chronic, including asphyxiation and explosion hazards. LFG collection and control systems are important to prevent gas accumulation.

Landfills around the Territory are designed to various standards. Most do not have liners in place or gas collection systems, and stormwater is rarely controlled to prevent offsite contamination. Poorly designed landfills with few opportunities to separate waste streams result in short trench lifespans and excessive areas designated for waste disposal. Where landfills are unfenced and unmanned, or inaccessible to the community, poor waste management practices can result. This can include littering, illegal dumping and indiscriminate disposal of waste streams to landfill, and can result in public health impacts.

#### 5.4.2 Litter and illegal dumping

Litter and illegal dumping cause serious environmental and social impacts, and are a financial burden on Territorians.

In the NT, illegal dumping is particularly prevalent in catchment reserves managed by Power and Water Corporation, and on vacant Crown land managed by the Territory Government's Department of Lands, Planning and the Environment (DLPE). The DLPE has identified several 'hot spots' to monitor for illegal dumping, and engages contractors to undertake the clean-up work on its behalf.

Illegal dumping can introduce pests and weeds and facilitate higher rates of erosion by interfering with natural vegetation cover. Serious forms of illegal dumping including chemicals or asbestos can cause serious injury or harm and can lead to environmental pollution. Through the 24-hour NT EPA Pollution Hotline the community can report occurrences of illegal dumping for investigation, commonly involving building materials and concrete rubble, vehicle bodies and green waste.

The procedure for responding to litter is not well coordinated in the Territory. Various NT Government agencies and local Councils undertake activities to address litter within their jurisdictions. While the councils commit staff and resources to education and clean-up programs, litter remains an ongoing issue.

The 2012-13 Keep Australia Beautiful National Litter Index (KAB Litter Index) reported that there were 51 items per  $1000\text{m}^2$  on average recorded across the 76 sites that were surveyed in the Territory. This was slightly lower than the national average of 56 items per  $1000\text{m}^2$ . Cigarette butts were the most frequently identified litter item, and uncategorized plastic objects the largest contributor to volume in the litter stream.

The KAB Litter Index suggests that the number of regulated containers in the litter stream fell immediately following the introduction of the Container Deposit Scheme (CDS) in January 2012. This is the Territory's key resource recovery initiative, and has seen approximately 155 million beverage containers returned to collection depots.

The KAB Litter Index also indicates a notable decrease in the average number of plastic bags littered pre- and post- the Territory's Plastic Bag Ban introduced in 2011 under the EP(BC&PB)Act. A high level analysis conducted on overall plastic bag use suggests that a reduction of approximately 10.3 million plastic bags has occurred as a result of the Ban.

The volumes of data generated by the KAB Litter Index and the CDS program allows for a review of the effectiveness of litter abatement and resource recovery initiatives. The information available on end-point waste disposal is less accessible, with no single authority responsible for collating and assessing this datum in the Territory.

#### 5.5 DATA AVAILABILITY

Extensive resource recovery data are currently available through quarterly and annual reporting through approvals issued under the EP(BC&PB)Act. Outside of the beverage container resource stream, licensed waste handlers provide annual waste volume reports to the NT EPA, but data are limited from sites without weighbridge facilities and unlicensed waste facilities. Data on the amount of waste being diverted from, or disposed of to landfill, is essential to set waste reduction targets for the future. The lack of reliable and complete waste collection and management data for the Territory limits the critical assessment of strategic goals and performance indicators.

Going into 2015, the NT EPA will be launching an online licensing system, which is expected to streamline the process for reporting and analysing data from licensed facilities. The greater ability to track waste movements will improve the capacity of the NT EPA to investigate illegal dumping within the Territory, and meet national reporting obligations under the *National Environment Protection (Movement of Controlled Wastes between States and Territories) Measure* for interstate tracking of hazardous materials.

# 6. CONCLUSIONS ON WASTE MANAGEMENT FOR THE TERRITORY

The volumes and types of waste generated in the Northern Territory will continue to increase with population growth and industry expansion. Planning for the future of the Territory must consider the actions required to effectively manage waste in order to reduce the economic, environmental and health impacts of poor waste management, and to improve rates of resource recovery and recycling.

Existing regulation is not sufficient to provide incentives for innovative waste solutions or to deter inappropriate waste practices. Remote communities face the health risks of hazardous wastes being buried in poorly designed landfills due to prohibitive transportation costs, and the associated environmental costs are simply unknown. The Territory is missing out on economic opportunities to process, recover or re-use resources due to insufficient end-use market demand, and increasingly complex waste streams produced by expanding industries.

Improvements are required to both educate and regulate waste practices in the Territory, particularly with regard to minimum standards for the construction and operation of disposal sites, and the separation of waste streams to expand the options for further treatment and resource recovery.

New developments are required in the areas of planning for emergency waste management, and to facilitate opportunities to explore technologies for the beneficial re-use of wastes.

Further review and implementation of the available environmental legislation will improve the NT EPA's capacity to measure and reduce the impacts of waste handling activities and to steer practice towards achieving the preferred hierarchy of waste management options.

The improvements and developments recommended by the NT EPA will enhance the environmental outcomes of waste management in the Territory. With greater access to waste programs and information, the public and community can drive behavioural changes towards a more sustainable future. Informed forward planning can facilitate industry expansion and provide solutions for complicated emerging waste streams.

An improved and clarified regulatory approach will help to define and deter inappropriate waste management, and should be utilised to remove existing barriers to exploring and implementing innovating thinking surrounding the future of waste management and resource recovery in the Territory.



Complicated wastes require innovative solutions

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# 8. SUMMARY OF NT EPA MANAGEMENT ACTIONS

## Engagement and education

The NT EPA will undertake the following actions to engage and educate on reducing waste generation and minimising the impacts of waste disposal:

1. promote community awareness and understanding of resource efficiency, waste avoidance and resource recovery;
2. fund community grants programs that encourage the reduction and/or reuse of waste in homes, schools, community groups and workplaces;
3. facilitate and promote product stewardship programs for recycling and treating nationally significant waste streams, including tyres, batteries, e-waste, paint and oil;
4. provide best-practice guidance materials for handling and disposing of commercially generated wastes including asbestos, contaminated soils, concrete and wastewater;
5. collaborate with the Waste and Recycling Industry of the NT (WRINT) to identify emerging trends and issues requiring multi-faceted solutions;
6. facilitate coordination of localised waste arrangements in regional development projects;
7. work with local government and the NT Government to coordinate local efforts to prevent litter and illegal dumping;
8. work directly with local and regional Councils and local service authorities to monitor, detect and reduce community exposure to the risks of poor waste management; and
9. work with industry and government agencies to explore the costs associated with transporting hazardous waste out of remote communities, and opportunities available to reduce these costs.

## Improve waste management

To promote waste reduction and resource recovery in the Territory the NT EPA will:

10. develop and guide waste avoidance and reduction programs;
11. drive the rollout of the Container Deposit Scheme (CDS) in remote communities;
12. continue to provide regulatory oversight to the Plastic Bag Ban;
13. support proposals by regional councils to consolidate recycling infrastructure at central locations;
14. facilitate opportunities to connect waste recovery and reuse markets with key waste producers (e.g. organics, green waste, construction and demolition waste and commercial and industrial waste); and
15. work with industry and government agencies to demonstrate the economic incentives available through improved waste management and resource recovery, including options for reducing greenhouse gas emissions from landfill.

To bring Territory landfills towards best practice management the NT EPA will:

16. assess the status of landfill sites in the Territory to:
  - prioritise high environmental risk sites requiring operational improvement, impact monitoring or rehabilitation, including in a remote context;
  - regulate landfills in accordance with the objectives of the WMPC Act;

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17. develop guidance to demonstrate best practice expectations:
  - Identify and develop guidelines to assist landfill operators in better managing their waste and resources;
  - Develop landfill closure guidelines and procedures to ensure ongoing management, aftercare and rehabilitation of closed sites;

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18. develop a waste infrastructure mapping database to identify locations of accessible facilities and to assist strategic planning for the future requirements of the Territory; and

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19. collaborate with local waste operators and industry bodies to identify and address the limitations to their delivery of waste management services.

In planning for future waste the NT EPA will liaise with government agencies to ensure future waste management requirements are considered at the development planning stage, and will:

20. recommend waste reduction and waste management plans are developed and implemented on significant developments;

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21. advise on specific infrastructure required to deal with liquid wastes generated locally;

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22. highlight the need for early consideration of asbestos disposal locations across the NT, including in remote housing and infrastructure projects;

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23. assist local and regional councils and industry to identify key infrastructure needs and to identify appropriate land for future waste management sites; and

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24. recommend that industry and government agencies seek innovative technologies as preferred waste solutions, to stimulate waste research and investment (e.g. organics recovery to reduce greenhouse gas emissions).

The NT EPA will develop a best practice NT Emergency Waste Management Plan, in consultation with the NT Government Emergency Management Council and other stakeholders addressing:

25. identified high risk activities that will be required to maintain emergency waste management plans;

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26. recommended measures for reducing waste when responding to environmental emergencies;

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27. new waste streams from emerging industries that may be of high risk and require emergency plans;

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28. stocktake available waste resources, including land available for the safe temporary storage or treatment of waste;

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29. commercial arrangements to be put in place allowing industry to be called on in an emergency; and

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30. waste tracking requirements at the onset of emergency disasters, from waste generation until disposal.

### **Improve waste data collection, monitoring and analysis**

31. identify waste facilities that are not reporting waste data and develop an approach for capturing essential data from these sites;
32. develop an improved system for recording and interpreting waste data required to be collected by the NT EPA;
33. continue to participate and assist in the development of nationally consistent waste classification systems;
34. prioritise targeted waste streams for an audit and compliance program, to ensure a complete tracking pathway from source to destination;
35. assist industry to identify business opportunities where demand for waste treatment facilities is not being met;
36. ensure relevant Government and Council agencies have access to waste data as required to inform strategic planning; and
37. undertake an analysis of NT waste streams based on available data.

### **Improve the regulatory framework**

To improve the regulatory framework for waste management across the Territory, the NT EPA:

38. is conducting a review of the WMPC Act and the Litter Act. This will provide the public, industry, government and local government with a discussion paper examining the deficiencies and strengths of the Acts in providing soundly managed waste issues; and
39. will assess the waste-related components of other legislation administered by the NT EPA to determine their relevance and effectiveness as tools to improve waste management practices in the Territory.

### **Reporting and Public Reviews**

To maintain transparency and ongoing improvements in waste management outcomes in the Northern Territory, the NT EPA will:

40. Provide an update on progress in implementing each of this Strategy's management actions in its annual report; and
41. Review the Strategy, and as appropriate, renew its content, within five years.

# APPENDIX A: KEY WASTE AND RESOURCE RECOVERY PRINCIPLES

## 1. WASTE STREAMS

Waste comes in many different forms. The term ‘waste stream’ is used to describe a category of waste type, and may be used to classify wastes depending on their characteristics. Currently national waste streams incorporate; Municipal Waste, Construction and Demolition Waste, Commercial and Industrial Waste and Green Waste.

For the purpose of regulating waste in the NT, the NT EPA describes waste materials that are considered to be harmful to people and/or the environment if disposed of incorrectly, as ‘listed wastes’. Listed wastes are specified in Schedule 2 of the *Waste Management and Pollution Control (Administration) Regulations*.

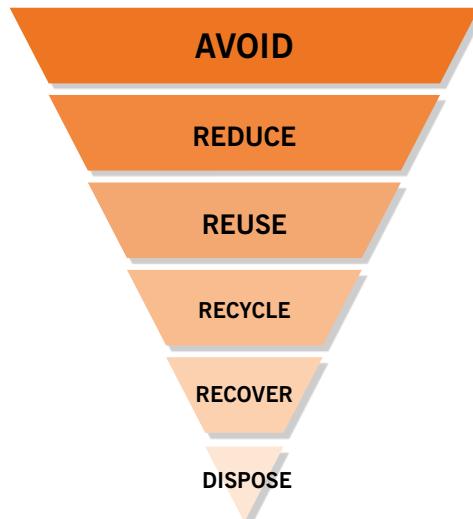
Dangerous goods classifications apply if the waste is classified as dangerous goods under the *Australian Dangerous Goods Code for the Transport of Dangerous Goods by Road and Rail*.

The Australian Government Department of the Environment is undertaking to analyse and integrate each state and territory’s waste data approach to develop a national federated waste data system, which will assist to streamline waste definitions, data collection methods, and data storage processes nationally.

## 2. WASTE HIERARCHY

The preferred approach to improve waste management in the Territory is to strive towards achieving the waste management hierarchy.

The waste management hierarchy is a nationally and internationally accepted philosophy for prioritising and guiding efforts to manage waste. The waste management hierarchy describes the preferred order for managing waste and resources. The framework ranks waste avoidance and reduction as the optimal approach (as outlined in Figure 1), through making choices that avoid unnecessary consumption.



**Figure 1: Waste Management Hierarchy (sourced from Rockhampton Regional Council)**

When avoidance and reduction is not possible, the next most preferable option is to reuse materials without any further processing. Next is recycling, which involves processing waste materials to make the same or different products, keeping materials in the productive economy. It may be possible to recover the energy from materials where further recycling is not feasible.

Disposal is the least preferred option, but may be the most appropriate management option for wastes that cannot be safely recycled or treated to minimise their environmental or health impacts.

# APPENDIX B: POLICY AND LEGISLATION

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## 1. WASTE MANAGEMENT AND POLLUTION CONTROL ACT (WMPC ACT)

The WMPC Act is the key piece of legislation for managing wastes in the Territory. A number of concerns with the Act have been identified since its introduction in 1999. Some of these concerns represent an unacceptable risk to the environment as they prevent the NT EPA from taking action to enforce the Act.

A review of the WMPC Act was undertaken in 2007. That review focussed on operational matters, such as the number of licences issued, rather than strategically considering how effective the Act was in delivering on its objectives.

The WMPC Act is under review by the NT EPA, in accordance with responsibilities under Part 3 of the Northern Territory Environment Protection Authority Act (NT EPA Act) to provide advice to the Minister for Lands, Planning and the Environment (the Minister).

## 2. ENVIRONMENT PROTECTION (BEVERAGE CONTAINERS AND PLASTIC BAGS) ACT (EP(BC&PB)ACT)

The EP(BC&PB) Act is the Territory's primary legislation for increasing resource recovery and reducing litter. This Act establishes the legal framework for the Container Deposit Scheme (CDS) and the Plastic Bag Ban. The inefficiencies created by this Act have resulted in limited access to the CDS by the Territory community.

The EP(BC&PB) Act was reviewed in 2014. The amendments made to this Act will be implemented over 2014 and 2015. This should see some of the barriers to the implementation of the CDS in remote areas removed and see more of the Territory's community gain access to the scheme.

## 3. LITTER ACT

The *Litter Act* was originally introduced as the Litter Ordinance in 1972 and has not been substantially reviewed or amended since 1990. The *Litter Act* does not provide a contemporary holistic litter management scheme. The *Litter Act* addresses limited litter related matters and is difficult to enforce. Penalties are low and do not establish a level of deterrence. There is opportunity to explore enforcement of the *Litter Act* by multiple agencies beyond the NT EPA.

## 4. PRODUCT STEWARDSHIP ACT 2011

The *Product Stewardship Act 2011* provides the framework to effectively manage the environmental, health and safety impacts of products, and in particular those impacts

associated with the disposal of a product. The framework includes voluntary, co-regulatory and mandatory product stewardship based on resource recovery. Product Stewardship acknowledges that those involved in producing, selling, using and disposing of products have a shared responsibility to ensure that those products or materials are managed in a way that reduces their impact on the environment, human health and safety, throughout their lifecycle.

There are a number of industry-led product stewardship schemes to ensure products are diverted from landfill and disposed of safely. These product schemes include e-waste, tyres, batteries and paints. The NT EPA provides representatives for the Territory on the implementation working groups of these schemes.

The National Television and Computer Recycling Scheme requires television and computer industries to fund collection and recycling of a proportion of the televisions and computers disposed of in Australia each year. Industry is required to take responsibility for a progressively higher proportion of total waste televisions and computers each year, from 30 per cent in 2012–13 to 80 per cent by 2021–2022.

Darwin is considered to be remote in a national context and implementation of the Scheme has not progressed as quickly as it has in other parts of Australia. The Department of Environment released a report on the National Television and Computer Recycling Scheme outcomes for 2012–13. It reported that of the 635 e-waste collection services that have been established across Australia, just four of them are located in the Northern Territory. Across Australia 31,186 tonnes of e-waste was collected in 2013, with 4.4 tonnes collected in the Northern Territory.

Tyre Stewardship Australia (TSA) has been established by tyre importers to administer a national tyre product stewardship scheme. Through the scheme, TSA aims to increase domestic tyre recycling, expand the market for tyre-derived products and reduce the number of Australian end-of-life tyres that are sent to landfill, exported as baled tyres or illegally dumped.

The Australian Paint Manufacturers' Federation members represent 85% of the paint manufacturing industry in Australia. This Federation is the lead industry association in the development of a national scheme to increase the recovery and minimise the environmental, health and safety footprint of waste paint in Australia. This scheme will aim to, for the first time, allow trade painters a safe and reliable mechanism to deal with their waste.

## GLOSSARY

|  |  |
|--|--|
| Avoidance  | Action to reduce the amount of waste generated   |
| CDS  | Container Deposit Scheme   |
| Commercial and industrial waste<br>(C&I waste)   | Solid waste generated by businesses, industries (including shopping centres, restaurants and offices) and institutions (such as schools, hospitals and government offices), but not C&D waste or MSW   |
| Construction and Demolition waste<br>(C&D Waste) | Solid waste sourced from construction and demolition works, including building and demolition waste, asphalt waste and excavated natural material  |
| Disposal   | Solid waste that is disposed of to landfill, incinerated or destroyed without energy recovery, or is unrecovered litter.   |
| E-waste  | End-of-life electronic equipment, such as televisions, computers, mobile phones, stereos and small electrical appliances (but not whitegoods)  |
| Hazardous waste                                  | Waste that poses substantial or potential threats to public health or the environment  |
| KAB Litter Index                                 | Keep Australia Beautiful Network bi-annual litter count  |
| Listed waste                                     | Listed wastes are defined under Schedule 2 of the <i>Waste Management and Pollution Control (Administration) Regulations</i> .   |
| LNG  | Liquid Natural Gas   |
| Municipal waste                                  | Waste from households and local government operations, including waste placed at the kerbside for local council collection and waste collected by councils from municipal parks and gardens, street sweepings, council engineering works and public council bins.  |
| Product stewardship                              | A policy approach recognising that manufacturers, importers, retailers, governments and consumers have a shared responsibility for the environmental impacts of a product throughout its full life cycle. Product stewardship schemes establish a means for relevant parties in the product chain to share responsibility for the products they produce, handle, purchase, use and discard |
| Recycling  | A set of processes (including biological) that converts solid waste into useful materials or products, net of contaminants/residuals disposed  |
| Resource recovery                                | The sum of materials sent to recycling and energy recovery facilities minus contaminants/residual wastes sent to disposal  |
| Reuse  | Involves recovering value from a discarded resource in its original state without reprocessing or remanufacture  |
| Stabilisation ponds                              | A natural method for wastewater treatment  |
| Trade waste                                      | A liquid or liquid borne waste generated from any industry, business, trade, manufacturing process or similar that is approved for discharge to sewer but does not include wastewater from a toilet, shower, hand basin or similar fixture   |
| Transfer facility                                | A facility where wastes are transferred from smaller vehicles (cars, trailers, trucks) into larger vehicles for transport to a disposal site   |
| Waste Avoidance                                  | Actions or approaches which result in the reduced generation of waste  |

# ntepa

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